

SLAUGHTER AND MAY /

**BASEL III:**

**A GUIDE TO THE  
MAIN PROVISIONS**

2022 Edition

An abstract graphic consisting of numerous curved, parallel lines in shades of orange and brown, sweeping across the bottom right portion of the cover. The lines vary in length and curvature, creating a sense of motion and depth.

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# Introduction

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## Introduction

Welcome to our guide to Basel III.

We have prepared this guide for banks and their regulators because we have found introductory reference guides to Basel III difficult to find. There is, in our view, a need for a guide to Basel III that assumes some knowledge of bank capital structures and business models but assumes no great knowledge of the foundational rules on which they are based. The enduring importance of the work of the Basel Committee on Banking Supervision (the Basel Committee) has, in our view, increased this need.

Basel III does not actually apply directly anywhere. The nature and extent of its application is dependent on its implementation by governments and regulators. But that does not diminish its importance as a set of fundamental standards of prudential regulation in the banking sector. There are many situations when knowledge of expectations based on Basel, in addition to binding rules in specific jurisdictions, is important. Most obviously, the Basel regime determines, or at least influences, the legislation and rules on bank prudential supervision that governments and regulators make. In addition, when agreeing to modify or waive its own rules, a banking supervisor may not wish to deviate from Basel standards. Banks requesting such waivers or modifications are therefore well advised to understand what the Basel standards are. Basel also plays an important role in the degree of deference that regulators are prepared to give to the regimes of regulators in other jurisdictions: substantive adherence to Basel has, in short, become a mark of seriousness and credibility in banking supervision. This has numerous consequences, from the willingness of a regulator to cede the lead (group) supervisory role over a banking group to a regulator in another jurisdiction following a merger, to the willingness of a regulator to permit a foreign bank to operate a branch in its jurisdiction. These are but some of the factors that are leading many banks to attach greater importance over time to knowledge and understanding of Basel requirements when engaging with their regulators.

Global finance has been seriously challenged since the global financial crisis of 2007-9, but arguably the main factor keeping it together has been the maintenance of global standards. These standards are, in effect, evaluated by regulators assessing each other when they consider the risks to banks that they supervise interacting with, or being in the same groups as, banks established in other jurisdictions. Basel provides regulators with a benchmark against which to assess the credibility of the regimes operated by their counterparts in other jurisdictions.

Against this backdrop, we hope that this guide will be of interest and use to banks, their regulators and anyone with an interest in prudential regulation.

The latest substantive episode in the Basel story, Basel III, has been a very long time in coming. The original consultation documents published after the 2007-2009 financial crisis were issued in December 2009 and finalised as standards in 2010, addressing certain urgent lessons that the Basel Committee drew from that crisis. A major focus of these standards was on the definition of capital, a feature of the Basel regime that had been almost unchanged since 1988, and on liquidity. Since then, the Basel Committee has worked out new approaches to capital requirements for credit risk, market risk, leverage, operational risk, large exposures, as well as the supervisory review process and market disclosure that constitute a total replacement of the Basel II Capital Accord.

In some areas Basel III builds on, and refines, Basel II, such as for the standardised approach to credit risk or the foundation internal ratings-based approach (F-IRB) to credit risk. In others, it restricts the availability of advanced models for calculating capital requirements permitted under Basel II, such as the advanced internal ratings-based (A-IRB) approach for credit risk, or the internal measurement approach for operational risk, which is withdrawn. In others, a wholly new and more risk-sensitive approach has been adopted, as under the new market risk framework. Originally, Basel III was expected to be implemented in full by 1 January 2022, although this was put back to 1 January 2023 due to the economic dislocations caused by the coronavirus pandemic. The United Kingdom and the EU have announced that implementation of the final elements of Basel III will be delayed until 2025.

The purpose of this guide is to provide a summary of the main aspects of Basel III as is intended to be implemented on 1 January 2023. The intention is to explain, without indulging in unnecessary mathematics, how the new rules work and what the principal relevant requirements are. However, we do not go into the details of all the new rules and this guide is no substitute for reviewing Basel III itself, which is very long and complex. Given the genesis of Basel III over the past 13 years, instead of referring to individual standards released by the Basel Committee since 2010, we refer instead to the comprehensive text of Basel III published on the Committee's website, and revised in 2021. This will facilitate reference to individual requirements, where appropriate, although it cannot exclude future changes made by the Basel Committee and incorporated subsequently into the consolidated text.

Basel III, insofar as it has not yet been implemented already, will make major changes to the regulatory capital requirements for banks. The intention is to ensure that banks' capital requirements correspond more closely to the risks incurred in the course of their business, and with their internal allocation of economic capital.

Basel III does not change the minimum capital ratio, which remains set at 8%, although national supervisors have the power to set higher ratios for banks if they consider this to be prudentially justified. However, it would be inaccurate to think that the old 8% ratio remains the same, as under Basel III banks must, additionally, meet a capital conservation buffer and (in certain circumstances) a counter-cyclical capital buffer, as well as satisfying a leverage ratio. Also, both the composition of capital and the minimum requirements for common equity Tier 1 capital, additional Tier 1 capital and Tier 2 capital changed under the 2010 standard, as has the calculation of risk-weighted assets, so it is not particularly meaningful to compare capital ratios under Basel III with those under Basel II.

This guide omits discussion of the requirements for total loss absorbing capital (TLAC) imposed on global systemically important banks. These requirements, which were inspired by the financial crisis, were issued by the Financial Stability Board (FSB). TLAC is only relevant to G-SIBs and (at national discretion) to domestic systemically important banks, and therefore is of concern only to such institutions and their groups. The application of the TLAC regime varies significantly around the world.

**IMPORTANT NOTE:** This guide is intended to provide assistance in understanding certain aspects of Basel III. It should not be relied upon as a substitute for legal advice which should be sought as required. Basel III is long and contains many technical provisions, and its application to specific situations or particular transactions will require careful consideration.

At Slaughter and May we have a long-established prudential regulatory practice, advising international and domestic banks on matters as varied as capital structure, domicile, structuring cross-border M&A transactions, capital issuances, risk weightings and risk mitigation transactions, liquidity, booking models and governance requirements. We are frequently involved in making technical submissions to regulators on these issues.

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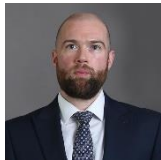
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# 1. OVERVIEW

## 1.1 Regulatory Capital

- 1.1.1 The purpose of regulatory capital is to support the day-to-day operations of a bank. It serves as a permanent fund which is able to absorb losses arising in the ordinary course of a bank's operations, and therefore enables a bank to carry on trading in times of economic adversity. Capital also serves important prudential purposes. Firstly, it helps to insulate a bank from insolvency, and thereby protects the bank's depositors if the bank becomes insolvent. Secondly, through reducing the risk of bank failures, capital helps to reduce systemic risk within the financial system. This is the risk that the insolvency of a single bank may, owing to the exposures to it of other banks and financial institutions, trigger further insolvencies, potentially causing serious problems for the financial system. This risk became of global significance following the bankruptcy of Lehman Brothers in September 2008.
- 1.1.2 Because of the importance of capital in protecting depositors and reducing systemic risk, banking regulators in all developed countries have specified minimum requirements for regulatory capital. The regulation of a bank's capital therefore supplements other aspects of prudential regulation, such as minimum cash or liquidity ratios, and approval of a bank's shareholders and senior management to ensure that they are "fit and proper".
- 1.1.3 In the UK banks are required under the Financial Services and Markets Act 2000 to maintain financial resources that are adequate in relation to the regulated activities that they carry on. Detailed rules define what constitutes capital for regulatory purposes and set out the amount of capital that a bank must hold to cover specified risks. Currently, the requirements for UK authorised banks are mainly set out in various pieces of EU legislation that were applicable when the UK left the European Union at 11 pm on 31 December 2020, supplemented by the rulebook of the Prudential Regulation Authority ("PRA"). A major current topic in UK financial regulation is the extent to which the EU-inspired rules and requirements may suitably be amended to promote the position of London as a global financial centre. As the UK has stated its intention to abide by international standards, it seems highly likely that in the area of prudential regulation the UK will be guided by the Basel standards (which, as a Committee member, it has had a role in formulating).

## 1.2 The Basel Committee

- 1.2.1 The Basel Committee was established by the central bank governors of the Group of Ten countries at the end of 1974 following serious disturbances in the international currency and banking markets. Its membership has expanded over time and currently comprises senior officials with bank regulatory and financial supervisory responsibilities from central banks and banking regulators in 28 jurisdictions. The chairman is Pablo Hernández de Cos, who is also head of the Bank of Spain. The Committee now reports to an

oversight body, the Group of Central Bank Governors and Heads of Supervision (“GHOS”), which comprises central bank governors and (non-central bank) heads of supervision from member countries. The current chair of the GHOS is François Villeroy de Galhau, Governor of the Banque de France.

- 1.2.2 The members of the Basel Committee are Argentina, Australia, Belgium, Brazil, Canada, China, the European Union, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, the UK and the United States. In addition to member organisations, a number of institutions currently hold observer status. These include the following country observers: the Central Bank of Chile/Banking and Financial Institutions Supervisory Agency, the Central Bank of Malaysia, and the Central Bank of the United Arab Emirates; and the following supervisory groups and international agencies or bodies: the Bank for International Settlements, the Basel Consultative Group, the European Banking Authority, the European Commission and the International Monetary Fund. Its Secretariat is located at the Bank for International Settlements (BIS) in Basel, Switzerland.
- 1.2.3 The stated mandate of the Basel Committee is to strengthen the regulation, supervision and practices of banks worldwide with the purpose of enhancing financial stability. Its focus has traditionally been on internationally active banks, although the Committee’s standards have been applied more widely, particularly in the European Union.
- 1.2.4 The Basel Committee formulates standards and guidelines, and recommends statements of best practice. The rules and guidance adopted by the Basel Committee have no legal force and their authority derives from the commitment of banking supervisors in member countries (and, increasingly, non-member countries) to implement the requirements agreed by the Committee. The Committee has adopted standards on a wide range of issues relevant to banking supervision, including banks’ foreign branches, core principles for banking supervision, core principles for effective deposit insurance, internal controls, supervision of cross-border electronic banking and risk management guidelines for derivatives.
- 1.2.5 However, in recent decades, the Basel Committee has devoted most of its attention to regulatory capital. It has also been active in the important areas of liquidity risk and developing frameworks for the recovery or orderly wind-down of internationally active banks that get into financial difficulties. The Basel Committee is also a forum for consultation on aspects of banking supervision. Its objective is to improve the quality of banking supervision through exchanging information on national supervisory arrangements, improving the effectiveness of techniques for supervising internationally active banks and setting minimum supervisory standards.

### 1.3 The 1988 Capital Accord

- 1.3.1 The first Basel Capital Accord was adopted in 1988. The 1988 Capital Accord was based on four core principles which are retained by Basel III. These are:
  - (a) A common definition of regulatory capital.



- (b) The determination of the amount of capital that a bank is required to hold through applying a risk weight to particular assets and off-balance sheet items (“risk weighted assets”).
- (c) The setting of a minimum ratio of regulatory capital to risk weighted assets (the “risk asset ratio”).
- (d) Consolidated supervision of banking groups.

#### 1.4 Reasons for Change

1.4.1 After 1988 there were major changes in financial markets with the development of new financial products, trading strategies and risk mitigation techniques. A review of these developments led the Basel Committee to identify several defects in the 1988 Capital Accord. In particular the Basel Committee considered that:

- (a) Capital ratios were not always a good indicator of a bank’s financial condition.
- (b) The approach of the 1988 Accord to risk weights provided a crude indicator of risk.
- (c) A lack of sensitivity to credit risk provided an incentive for banks to exploit differences between economic capital and regulatory capital (for example, by increasing lending to poor credit quality borrowers, which attracted a higher rate of interest, but the same capital charge).
- (d) There were inadequate incentives for banks to use credit risk mitigation techniques, in particular collateral and credit derivatives, as such techniques were often not recognised.
- (e) There were insufficient incentives for banks to develop more accurate internal measurements of risk as this would not result in any capital savings.

1.4.2 The Basel Committee concluded that these difficulties resulted from a lack of sensitivity in the 1988 Capital Accord and that it should therefore be replaced.

#### 1.5 The Structure of Basel II

1.5.1 The structure of Basel II differed significantly from that of Basel I. It was considerably more complex and in many areas provided a choice of different approaches for determining capital requirements (which, in some significant areas, have been narrowed by Basel III). For example, Basel II set out three different ways of calculating credit risk and three (or four) ways of determining the capital charge for operational risk (now only one). Generally, banks were free to choose between more complex methodologies, with the potential for capital savings, and simpler approaches, that generally lead to a higher capital charge, but with lower operational and systems costs.

1.5.2 The focus of Basel II (like Basel III) was on internationally active banks. However, the Basel Committee considered that the principles developed in

Basel II might be suitable as an international benchmark. Overall, Basel II was considerably more risk sensitive than Basel I. It also marked a shift in favour of greater reliance on banks' internal models and methodologies, and external credit ratings. Both of these developments would come under considerable scrutiny in the aftermath of the financial crisis leading to Basel III.

## 1.6 Lessons from the Global Financial Crisis

- 1.6.1 Before Basel II could be fully implemented on 1 January 2008 the global financial crisis hit. The explanations for why it happened look set to be debated by economists and historians in the decades to come. Nonetheless, certain clear lessons were apparent early on, and guided the Basel Committee in its decade-long work on Basel III.
- 1.6.2 Given its delayed implementation, Basel II clearly cannot be said to have caused the financial crisis, although it may be fair to say that, had the Basel II requirements been fully implemented earlier, or had measures adopted by the Basel Committee (such as those relating to securitisations) been fully applied at the relevant time, the crisis might not have played out in quite so severe a manner. Hindsight, of course, facilitates such analyses.
- 1.6.3 However, even if Basel II had been fully implemented in 2007 there is no reason to doubt that the market's appetite to accept risk in the pursuit of yield, balance sheet arbitrage, rapid financial innovation and complexity of financial product design, would nevertheless have occurred, possibly in much the same way.
- 1.6.4 Extensive *ex post* analysis of the financial crisis led to a broad consensus among governments, regulators and market participants that there was a fundamental failure in market discipline as much as in the regulation of markets, and that the causes of this failure went far beyond mere inadequacies in bank capital requirements. Nevertheless, a consensus also rapidly developed that there were a number of deficiencies in the Basel II regulatory framework that needed to be addressed.
- 1.6.5 A fundamental failing demonstrated by the financial crisis was that the financial sector did not hold enough capital. More highly capitalised institutions would have been better placed to absorb losses without requiring government support or enforced mergers with stronger institutions. The quality of much financial sector capital also proved to be inadequate and did not absorb losses in the crisis. For example, in the run up to the crisis banks continued paying dividends and coupons on preference shares and hybrid securities for fear otherwise of signalling financial weakness. Holders of subordinated debt did not suffer significant losses when insolvent institutions were rescued by taxpayers. In fact, holders of all these forms of capital benefited from public sector equity injections which ranked behind other Tier 1 and Tier 2 capital instruments.
- 1.6.6 The lack of emphasis on liquidity in the Basel II framework was also striking. Capital requirements were - and are - concerned with solvency, and aim to enable an institution to continue trading in times of financial adversity. However, a bank can also fail as a result of insufficient liquidity. In its initial

stages the financial crisis manifested itself through a lack of liquidity at such institutions as Northern Rock in the UK and Bear, Stearns in the United States.

- 1.6.7 Another feature of the Basel II regime that received criticism was that it did not impose restrictions on leverage. This gave rise to incentives for banks to engage in riskier trading activities in the relatively benign economic conditions that prevailed prior to the summer of 2007, which boosted revenues and profits in that period, but at the same time increased systemic risk and the possibility of bank failures. By way of example, if a bank is leveraged 30:1 then a fall in the value of its assets of 3.4% will generate losses greater than the amount of its common equity resulting in the bank becoming balance sheet insolvent.
- 1.6.8 The focus of Basel II on capital also resulted in regulators overlooking the growth of systemic risk as they concentrated on the position of individual institutions. Ultimately, the interconnectedness of large and small institutions created through complex webs of OTC derivatives and the rapid growth of an unregulated “shadow banking sector” resulted in a situation where the failure of a moderately-sized investment bank, Lehman Brothers, risked bringing down the global financial system.
- 1.6.9 In addition, the capital requirements for banks’ trading books and securitisations failed to reflect the real level of risk in those areas. Financial institutions were, therefore, incentivised to book transactions in the trading book, many of which were illiquid assets such as the infamous collateralised debt obligations (CDOs), which were securitisations of securitisations, or even more complex instruments. In the absence of a ready market, institutions marked those assets to model, but little actual trading took place. Once the crisis broke, firms experienced increasingly large losses in their trading portfolios, which, together with a lack of liquidity, was the proximate cause of Bear, Sterns’ and Lehman Brothers’ failure. Rating downgrades to assets also became a significant cause of mark-to-market losses but, unlike credit defaults, the Basel II framework did not take this problem into account.
- 1.6.10 The financial crisis also demonstrated structural flaws in the value at risk (VaR) models used by financial institutions to calculate regulatory capital requirements for market risks: short observation periods combined with historically low volatility in market prices (with limited data sets that did not include data from a severe economic downturn), models systematically underestimating the significance of low frequency high impact events, overlooking the importance of systemic risk and the presence of uncertainties that are not capable of being modelled. According to VaR measures, risk was low in spring 2007; in fact, the system was fraught with huge systemic risk.
- 1.6.11 Perhaps most damning of all was that many of the senior managers of the institutions most at risk did not understand, and in many cases were not in a position to understand, these matters<sup>1</sup>. This resulted in an overreliance in many firms on technical staff who effectively determined matters of critical importance to the stability of the institutions concerned. In many cases banks’ trading book portfolios, or parts of them, proved to be extremely difficult to value once liquidity evaporated, the models previously employed by the banks having broken down and senior management of many banks having lost

confidence in those models and their seemingly indecipherable mathematical complexity.

- 1.6.12 The result was a series of unprecedented government bail-outs worldwide<sup>2</sup>, or facilitated mergers of failing financial institutions. As this amounted to the socialisation of private sector losses, as governments around the world sought to rescue their financial systems, it is wholly understandable that banking regulators would seek to improve the solvency and liquidity of financial institutions in future to mitigate moral hazard.

## 1.7 The Three Pillars of Basel

- 1.7.1 Basel II adopted two complementary pillars to the minimum risk-based capital requirements (Pillar 1). The second pillar (Pillar 2) refers to the supervisory review process, which essentially describes how supervisors should regulate internationally active banks in their jurisdiction. In particular, it required that banking supervisors should have the power to compel banks to hold capital in excess of the 8% minimum ratio where this was justified. Standards were also adopted for the control of interest rate risk in a bank's loan portfolio, and to capture other risks not specifically covered under Pillar 1 (for example, certain risks arising out of securitisations).
- 1.7.2 The third pillar (Pillar 3) relates to market disclosures of information. The intention was that pressure from a bank's counterparties, analysts and rating agencies would serve to reinforce the minimum capital standards and ensure that banks carried on their business prudently. This goal was demonstratively not met in the run up to the global financial crisis.

### *Outline of Pillar 2*

- 1.7.3 The purpose of Pillar 2 "is intended not only to ensure that banks have adequate capital and liquidity to support all the risks in their business, but also to encourage banks to develop and use better risk management techniques in monitoring and managing their risks"<sup>3</sup>. National supervisors are expected to evaluate how well banks are assessing their capital needs relative to their risks and to intervene, where appropriate. This is intended to create a dialogue between banks and supervisors to ensure that where deficiencies are identified, prompt and decisive action can be taken to reduce risk or restore capital<sup>4</sup>. In the event of deficiencies in an individual bank's risk management and internal controls increased capital requirements should not be seen as the only option and other means, such as strengthening risk management, applying internal limits, strengthening the level of provisions and reserves, and improving internal controls, must also be considered. Furthermore, capital should not be regarded as a substitute for addressing fundamentally inadequate risk control or management<sup>5</sup>.
- 1.7.4 According to the Basel Committee:

"There are three main areas that might be particularly suited to treatment under Pillar 2: risks considered under Pillar 1 that are not fully captured by the Pillar 1 process (e.g. credit concentration risk); those factors not taken into account by the Pillar 1 process (e.g. interest rate risk in the banking book,

business and strategic risk); and factors external to the bank (e.g. business cycle effects)<sup>6</sup>.

1.7.5 Pillar 2 is based on the following four key principles which are set out below without the detailed elaboration in the Basel III text:

- (a) Principle 1: banks should have a process for assessing their overall capital adequacy in relation to their risk profile and a strategy for maintaining their capital levels<sup>7</sup>.
- (b) Principle 2: supervisors should review and evaluate banks' internal capital adequacy assessments and strategies, as well as their ability to monitor and ensure their compliance with regulatory capital ratios. Supervisors should take appropriate supervisory action if they are not satisfied with the result of this process<sup>8</sup>.
- (c) Principle 3: supervisors should expect banks to operate above the minimum regulatory capital ratios and should have the ability to require banks to hold capital in excess of the minimum<sup>9</sup>.
- (d) Principle 4: supervisors should seek to intervene at an early stage to prevent capital from falling below the minimum levels required to support the risk characteristics of a particular bank and should require rapid remedial action if capital is not maintained or restored<sup>10</sup>.

1.7.6 These principles are then followed with detailed requirements in respect of:

- (a) risk management<sup>11</sup>. This requires banks to carry out an internal capital adequacy assessment process (ICAAP) which is then reviewed by supervisors. There are also provisions on risk concentration, reputational risk, valuation practices, stress testing and liquidity risk management;
- (b) interest rate risk in the banking book. This is defined as the “the current or prospective risk to the bank’s capital and earnings arising from adverse movements in interest rates that affect the bank’s banking book positions”. When interest rates change, the present value and timing of future cash flows change. This in turn changes the underlying value of a bank’s assets, liabilities and off-balance sheet items and hence its economic value. Changes in interest rates also affect a bank’s earnings by altering interest rate-sensitive income and expenses, affecting its net interest income<sup>12</sup>. There are three main types of such risks: (1) gap risk arising from the term structure of banking book instruments; (2) basis risk reflecting the impact of relative changes in interest rates for financial instruments that have similar maturities but are priced using different interest rate indices; and (3) option risk from derivative positions or from elements in a bank’s assets, liabilities and off-balance sheet items with optionality<sup>13</sup>. Basel III sets out 12 principles and prescribes interest rate shock scenarios to be undertaken by banks. This is supplemented by guidance on how to apply the requirements<sup>14</sup>;
- (c) risks not fully taken into account under the frameworks for credit risk (including counterparty credit risk and securitisation)<sup>15</sup>, market risk<sup>16</sup> and operational risk<sup>17</sup>;

- (d) supervisory review of bank compensation practices including bonuses<sup>18</sup>;
- (e) risk data aggregation and risk reporting<sup>19</sup>; and
- (f) liquidity monitoring metrics that measure other dimensions of a bank's liquidity and funding risk profile than is done under the liquidity standards of the LCR and NSFR<sup>20</sup>.

### *Outline of Pillar 3*

- 1.7.7 A new version of the Pillar 3 standard comes into force on 1 January 2023. According to the Basel Committee:

“The provision of meaningful information about common key risk metrics to market participants is a fundamental tenet of a sound banking system. It reduces information asymmetry and helps promote comparability of banks' risk profiles within and across jurisdictions. Pillar 3 of the Basel framework aims to promote market discipline through regulatory disclosure requirements. These requirements enable market participants to access key information relating to a bank's regulatory capital and risk exposures in order to increase transparency and confidence about a bank's exposure to risk and the overall adequacy of its regulatory capital”<sup>21</sup>.

- 1.7.8 Banks must publish their Pillar 3 report in a standalone document that provides a readily accessible source of information for users. The Pillar 3 report may be added to, or form a discrete section of, a bank's normal accounting disclosures, but needs to be easily identifiable to users<sup>22</sup>. Pillar 3 is based on five guiding principles:

- (a) disclosures should be clear<sup>23</sup>;
- (b) disclosures should be comprehensive<sup>24</sup>;
- (c) disclosures should be meaningful to users<sup>25</sup>;
- (d) disclosures should be consistent over time<sup>26</sup>; and
- (e) disclosures should be comparable between banks<sup>27</sup>.

- 1.7.9 There are detailed prescribed disclosure requirements (with specific reporting periods for each) in respect of key prudential metrics and RWA<sup>28</sup>, the comparison between modelled and standardised RWA<sup>29</sup> (where firms use an internal model), the composition of capital and, for global systemically important banks TLAC<sup>30</sup>, capital distribution constraints if required by national supervisors at a jurisdiction level<sup>31</sup>, asset encumbrance<sup>32</sup>, information related to remuneration<sup>33</sup>, credit risk<sup>34</sup>, counterparty credit risk<sup>35</sup>, market risk<sup>36</sup>, credit valuation adjustments<sup>37</sup>, operational risk<sup>38</sup>, interest rate risk in the banking book<sup>39</sup>, bank-specific counter-cyclical capital buffers<sup>40</sup> and liquidity<sup>41</sup>.

## **1.8 The Building of Basel III**

- 1.8.1 Following consultation documents published in December 2009, the first part of Basel III was concerned mainly with the definition of capital eligible to

meet capital requirements and bank liquidity standards. It was finalised in July 2010, although subject to subsequent modification in January 2011. The 2010 publication also set out the capital conservation and countercyclical buffers, as well as changes to address the credit valuation adjustment risk. After that date, the Basel Committee turned its attention to other aspects of the capital framework that were shown to be inadequate in the financial crisis. The liquidity coverage ratio followed in 2013, the leverage ratio in 2014, the net stable funding ratio also in 2014, standards on securitisation in 2014 and 2016, and replacements for the standardised and IRB approaches to credit risk, together with credit valuation adjustments and operational risk in December 2017, and a revised market risk framework in 2019.

- 1.8.2 As mentioned above, implementation of the full Basel III framework was delayed in 2020 from 1 January 2022 to 1 January 2023. It will therefore be just over 13 years after publication of the first consultation document on Basel III that the new standard fully enters into force and 15 years before it is fully implemented in the UK and the EU. Unsurprisingly, a subsequent global economic crisis - this time triggered by the coronavirus pandemic - will have come (and may have gone) by the time Basel III is finally due for implementation. What lessons may be drawn from the pandemic for banking regulation remains to be seen, although, so far, there have been no major banking failures, facilitated by exceptional government support provided during the acute stages of the pandemic.

#### *The Three Pillars of Basel at a glance*

Basel II was based on three pillars which were intended to be interdependent and mutually reinforcing. These pillars also remain in place under Basel III with modification:

- Pillar 1: Minimum Capital Standards.
- Pillar 2: The Supervisory Review Process.
- Pillar 3: Market Discipline.

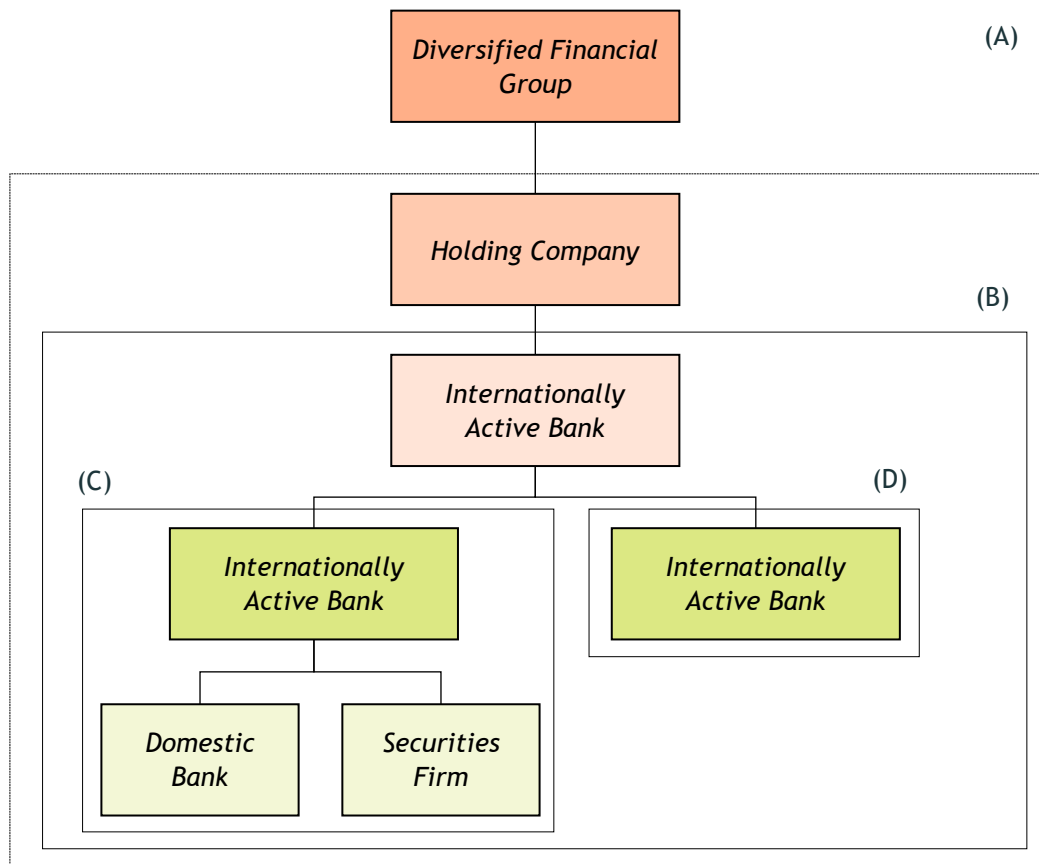
## 2. CONSOLIDATED SUPERVISION

### 2.1 Supervision of Groups

- 2.1.1 Basel III applies on a consolidated basis to internationally active banks. Consolidated supervision is considered to be the best means to provide supervisors with a comprehensive view of risks within a banking group<sup>42</sup>. This includes any holding company or companies of a bank provided that its subsidiaries “engage predominantly in banking activities”<sup>43</sup>. This will depend on both group structure and the activities engaged in by the holding company’s subsidiaries. Basel III does not state how the test of “predominantly” engaging in banking activities should be measured. Nor is there a clear definition of banking “activities” (unlike in EU law)<sup>44</sup>. However, it seems likely that a bare majority of activities carried on by subsidiaries measured on a balance sheet basis would not of itself be sufficient for a holding company to be subject to the Basel III framework. Moreover, it is clear from other parts of Basel III that the accord applies to non-banks that engage in activities comparable to banking (such as leasing, issuing guarantees or credit cards, providing means of payment, and securities trading). Supervisors are intended to have discretion in deciding on the application of consolidated supervision to individual banking groups.
- 2.1.2 In addition to applying on a group-wide consolidated basis, Basel III also applies to all internationally active banks at every tier within a banking group on a fully consolidated basis<sup>45</sup>. This means that where a banking group subject to Basel III contains more than one internationally active bank then Basel III must be applied to each internationally active bank that is a part of the group, including all of its direct and indirect subsidiaries that engage in “banking activities”. For example, if a UK banking group has a French subsidiary and a Japanese subsidiary (both being internationally active) then consolidation must also be carried out at the level of the French and Japanese banks, including all of their respective direct and indirect subsidiaries, as well as at the level of the UK group.



2.1.3 An example of this is set out below.



(A) represents the boundary of the predominant banking group subject to Basel III. (B), (C) and (D) are intermediate levels at which the accord also applies on a consolidated basis<sup>46</sup>.

2.1.4 An alternative to full consolidation set out in Basel III is to apply the framework to banks on a stand-alone basis, provided that the full book value of any investments in subsidiaries and significant minority-owned holdings is deducted from the bank's capital<sup>47</sup>.

2.1.5 Although Basel III applies only on a consolidated basis - and sets no solo or individual capital ratios for specific banks - the Basel III text states that "it is essential to ensure that capital recognised in capital adequacy measures is adequately distributed amongst legal entities. Accordingly, supervisors should test that individual banks are adequately capitalised on a stand alone basis"<sup>48</sup>. FAQ 1 adds that the framework "does not prescribe how to measure the solo capital requirements which is left to individual supervisory authorities"<sup>49</sup>. The traditional approach in the UK has been to apply the Basel framework on a stand-alone basis, as well as on a consolidated or solo consolidated basis.

2.1.6 Basel III applies to the greatest extent possible to all banking and other relevant financial activities (regulated and unregulated) to groups containing an internationally active bank<sup>50</sup>. Majority-owned or controlled banks, and securities firms, if subject to broadly similar regulation, should also be fully

consolidated. Insurance activities should not, as a general matter, be consolidated (see below)<sup>51</sup>.

- 2.1.7 Basel III recognises that there may be instances where consolidation is not feasible or desirable e.g. following a debt-equity conversion previously contracted and held on temporary basis following conversion. Other exceptions include where non-consolidation is required by law or if the entity is subject to different regulation<sup>52</sup>. Any majority-owned securities and financial subsidiaries that are not consolidated are deducted from capital, with the amount of the deduction increased to reflect any capital shortfall that is not corrected in a timely manner, in such subsidiaries<sup>53</sup>.
- 2.1.8 Significant minority investments in banking, securities and other financial entities are either excluded from consolidated capital or (under certain conditions) consolidated on a *pro rata* basis. *Pro rata* consolidation may be appropriate for joint ventures, or where the supervisory authority is satisfied that the parent is legally or *de facto* expected to support the subsidiary on a proportionate basis only, and that the other significant shareholders have the means and willingness to proportionately support it. The threshold above which minority investments should be either deducted or consolidated on a *pro rata* basis is determined by national accounting or regulatory practices<sup>54</sup>. The Basel approach to the deduction of “material holdings” is therefore less prescriptive than EU requirements, and has no specified thresholds, although the EU threshold of 20% to 50% is referred to as “an example”<sup>55</sup>.

#### *Insurance subsidiaries*

- 2.1.9 The Basel Committee believes that it is “in principle” correct to deduct banks’ equity and other regulatory capital investments in insurance entities, as well as significant minority investments in such companies<sup>56</sup>. This corresponds to the traditional treatment of insurance subsidiaries and significant investments in the UK since the 1980s.
- 2.1.10 However, “[a]lternative approaches that can be applied should, in any case, include a group-wide perspective for determining capital adequacy and avoid double counting of capital”<sup>57</sup>. FAQ 1 adds: “[j]urisdictions can permit or require banks to consolidate significant investments in insurance entities as an alternative to the deduction approach on the condition that the method of consolidation results in a minimum capital standard that is at least as conservative as that which would apply under the deduction approach”<sup>58</sup>. If the method results in lower capital ratios, banks must use these. Where it results in a capital benefit, this is disallowed. Further, majority-controlled insurance subsidiaries which are subject to the deduction treatment must themselves be adequately capitalised. Capital shortfalls that are not corrected in a timely manner are deducted<sup>59</sup>.
- 2.1.11 Where there is a capital surplus in an insurance subsidiary, this may be reflected in consolidated capital on a *pro rata* basis where there are minority interests. If the bank does not have a majority shareholding then any surplus capital is disregarded as the bank cannot direct the transfer of the surplus capital<sup>60</sup>.

- 2.1.12 Where an insurance subsidiary is not consolidated, supervisors “will ensure” that the insurance company is itself adequately capitalised to reduce the potential for loss to the parent banking group.
- 2.1.13 The treatment of insurance entities under Basel III (which is essentially the same as under Basel II) reflects the difference in prudential requirements for insurance companies and banks. There do not exist detailed global standards for insurance capital comparable to those for banks formulated by the Basel Committee. Also, insurers run different risks to banks given the nature of their business. It follows that for bank-assurance groups there may be significant capital differences depending on whether a bank or an insurance company sits higher in the group structure. If it is a bank then under Basel III the general rule is that all equity investments in insurers or reinsurers require deduction from the banking group’s consolidated capital. If an insurance company owns an internationally active bank, the Basel III framework will apply to the bank while national prudential standards for insurers will determine the treatment of the insurer’s investment in the bank.

## 2.2 Home/Host State Responsibilities

- 2.2.1 Basel II stated that the framework was not intended to change the legal responsibilities of national supervisors for the regulation of their domestic institutions or the arrangements for consolidated supervision. This statement is not repeated in Basel III but remains correct. It should be noted that under the Basel framework, the “home” supervisor is the supervisor of a parent bank and a “host” supervisor that of a subsidiary. A different definition applies under EU law with the “home” supervisor being the supervisor in the place of incorporation/head office and the “host” state is one where foreign branches are established.

## 3. COMPONENTS OF AND DEDUCTIONS FROM CAPITAL

### 3.1 Definition of capital

- 3.1.1 The definition of capital was the first part of Basel III to be finalised in 2010, and only minor changes have since been made to it. Detailed transitional provisions were originally set out, including time-limited grandfathering on a tapering basis for non-compliant capital instruments issued prior to the new standard. As all these provisions will have expired by 1 January 2023 no discussion will be provided here.
- 3.1.2 The types of regulatory capital were originally determined by the Basel Committee in 1988 and were left unchanged by Basel II<sup>61</sup>. However, the 2007-2009 financial crisis demonstrated the need for reform. Under Basel III there are only three categories of capital: common equity Tier 1, Additional Tier 1 and Tier 2 capital<sup>62</sup>. Total regulatory capital is the sum of the preceding items<sup>63</sup>. Basel III reinforces the position of common equity (and retained earnings), or core Tier 1 capital, as the predominant form of capital<sup>64</sup>. Prior supervisory approval is required for any instruments that provide for its “dividends” to be paid in anything other than cash or shares<sup>65</sup>. We understand this to apply not only to ordinary and preference shares, but also to debt securities where coupons are not (under English law) dividends but instead a debt. Regulatory capital under Basel III focuses on high-quality capital, predominantly in the form of shares and retained earnings that can absorb losses. Basel III also introduced an explicit going-and gone-concern framework by clarifying the roles of Tier 1 (going concern) and Tier 2 (gone concern) capital.

### 3.2 Common Equity Tier 1

- 3.2.1 Common equity Tier 1 capital comprises the following items:
- (a) common shares issued by the bank satisfying the criteria set by the Basel Committee (or equivalent for mutuals);
  - (b) share premium (stock surplus) where shares are issued at a premium;
  - (c) retained earnings;
  - (d) accumulated other comprehensive income and other disclosed reserves;
  - (e) common shares issued by consolidated subsidiaries of the banking group held by outside third parties (i.e. minority interests) which meet the criteria set out below; less
  - (f) regulatory adjustments applied in the calculation of common equity Tier 1 capital.
- 3.2.2 To ensure its quality and consistency Basel III sets out a list of criteria that common equity must satisfy. These are:

- (a) it is the most subordinated claim in a liquidation;
- (b) it has an unlimited and variable claim in a liquidation after all senior claims have been repaid (i.e. it is entitled to a claim on residual assets proportional to its share of issued capital and not limited to a fixed percentage as with traditional preference shares);
- (c) it is perpetual and is never repaid outside of liquidation (other than discretionary repurchases or other reductions of capital allowed under company law);
- (d) the bank does nothing to create an expectation at issuance that the instrument will be bought back, redeemed or cancelled (nor does the statutory framework);
- (e) distributions are paid out of distributable items (including retained earnings) and are not tied or linked to the amount paid at issuance, or subject to a cap (another feature of traditional preference shares);
- (f) there is no circumstance in which distributions are obligatory. Non-payment is not an event of default. Nor can the bank be required to make payments in kind (such as alternative coupon settlement mechanisms characteristic of pre-2010 innovative Tier 1 issues);
- (g) distributions are paid only after all legal and contractual obligations have been met and payments on more senior capital instruments have been made. This is stated to exclude preferential distributions in respect of other common equity Tier 1<sup>66</sup>;
- (h) the issued capital takes the first and proportionally greatest share of any losses that occur. Each instrument absorbs losses on a going concern proportionately. This requirement is hard to understand from an English law perspective as although losses may be expected to result in a fall in the share price, there is no sense in which the nominal amount of share capital is written down following a loss. In certain circumstances an English company *may* reduce its capital, but this is certainly not an automatic process and, for a public company, requires a court process. Negative reserves do not reduce share capital;
- (i) the paid up amount is classified as equity capital under relevant accounting standards, and not a liability for determining balance sheet insolvency. Under English company law all preference shares are treated as equity under the balance sheet insolvency test in section 123 of the Insolvency Act 1986, although the accounting treatment under IFRS depends on whether the preference share is redeemable in cash or another financial asset, or has a mandatory coupon;
- (j) the shares are directly issued and paid-in<sup>67</sup> and the bank did not fund the instrument or purchase<sup>68</sup>;
- (k) the paid-in amount is neither secured or covered by a guarantee of the issuer or a related entity, or subject to an arrangement that legally or economically results in more senior treatment;

- (l) the bank's shareholders have consented to the issue of the instrument;  
and
  - (m) the shares are paid up<sup>69</sup> either in cash or other consideration (such as shares), and if not paid up in cash prior supervisory approval has been obtained<sup>70</sup>; and
  - (n) the shares are separately disclosed on the bank's balance sheet<sup>71</sup>.
- 3.2.3 It follows that the following (amongst others) are not eligible as ordinary shares under Basel III:
- (a) shares with a fixed claim in a winding up;
  - (b) shares with a preference in either winding up or in respect to payment of dividends;
  - (c) shares with a fixed (but fully discretionary) coupon;
  - (d) shares with an alternative coupon satisfaction mechanism;
  - (e) shares that are accounted for as a liability; and
  - (f) indirect issues of shares (e.g. through an SPV). Minority interests in consolidated subsidiaries can count towards the consolidated common equity requirement as described below.
- 3.2.4 These requirements also apply to mutuals and co-operatives (such as building societies) taking into account their specific constitution and legal structure<sup>72</sup>. Where different from common shares, the instruments must preserve the quality of the instruments by being fully equivalent to common shares in terms of capital quality as regards loss absorption. An example of instruments that might meet the Basel III requirements for core Tier 1 capital are profit participating deferred shares (PPDS) issued by certain UK building societies.
- 3.2.5 Shares need not carry voting rights in order to meet the Basel criteria although non-voting shares must still satisfy all of the criteria set out above.

### 3.3 Additional Tier 1 Capital

- 3.3.1 Additional Tier 1 capital consists of the sum of the following:
- (a) instruments issued by the bank that meet the criteria for inclusion in additional Tier 1 capital;
  - (b) share premium on the issue of such instruments;
  - (c) instruments issued by consolidated subsidiaries to third parties that meet the requirements for recognition of minority interests; less
  - (d) regulatory adjustments applied in the calculation of total Tier 1 capital<sup>73</sup>.
- 3.3.2 FAQ 1 adds that subordinated loans are eligible as additional Tier 1 capital if the requirements set out in Basel III are met. The issuance of subordinated

debt as additional Tier 1 capital has traditionally been attractive owing to the tax deductibility of interest payments, although if the instruments are accounted for as a liability, additional requirements in respect of loss absorbency apply. Further, it is unclear how subordinated debt can meet the second criterion set out below (subordination to subordinated debt holders) unless this should (as would be logical) be interpreted as meaning that additional Tier 1 debt instruments must be subordinated to Tier 2 debt (which does not present any problems under English law). The problem comes from the reference to “subordinated debt” as any additional Tier 1 debt will be subordinated debt and an instrument cannot logically be subordinated to itself.

3.3.3 The detailed requirements for additional Tier 1 instruments are as follows:

- (a) it is issued and paid up<sup>74</sup>;
- (b) it is subordinated to depositors, general creditors and subordinated debt holders. For a holding company, subordination to all general creditors is required (which, we assume, means senior creditors);
- (c) it is neither secured nor covered by a guarantee of the issuer or a related company, or other arrangement, that economically or legally enhances its seniority;
- (d) the instrument is perpetual<sup>75</sup>;
- (e) there are no step-ups or incentives on the issuer to redeem<sup>76</sup>;
- (f) an issuer call may only be made after five years<sup>77</sup> and is subject to prior supervisory consent;
- (g) a bank must not do anything which creates an expectation that a call will be exercised;
- (h) a bank must not exercise a call unless either the instrument is replaced with capital of the same or better quality, or the bank demonstrates that its capital position is well above the minimum capital requirements (which may at national discretion be higher than the Basel III minima) after exercise of the call;
- (i) tax and regulatory calls<sup>78</sup> are permitted during the first five years after issuance with supervisory approval provided the bank could not anticipate such event occurring at the time of issuance;
- (j) any repurchase or redemption of the instrument is subject to prior supervisory consent, and the bank must not assume or create a market expectation that approval will be given;
- (k) all distributions must be fully discretionary, and a decision to cancel payment of a coupon must not impose any restrictions on the bank except in relation to distributions to ordinary shareholders (i.e. a dividend stopper is, in principle, acceptable - but see the discussion below in respect of not hindering recapitalisation). A note states that dividend

pushers are prohibited (i.e. a clause providing that if a distribution is made on a junior security or *pari passu* security within a previous period of time then the coupon/distribution payable on the senior instrument must be paid). Additionally, alternative coupon satisfaction mechanisms (which require the issuer to replace a cancelled coupon with newly issued ordinary shares) are prohibited, as are options allowing holders to convert the instrument on cancellation into equity. An FAQ prohibits optional dividends, with prior supervisory approval, equal to the aggregate unpaid amount of prior dividends;

- (l) dividends/coupons must be paid out of distributable items. A note adds that where (as in England) payment of coupons on debt is an expense item this requirement means that “such distributions ... should not be allowed by the regulator if the distributable items are not adequate to provide for them”<sup>79</sup>. Two points may be made on this. Firstly, it requires the calculation of distributable reserves in accordance with national company law, and the treatment of additional Tier 1 instruments, *as if* they were share capital out of which distributions may be made. Secondly, the note appears to require that the supervisor have the power to cancel distributions. To be legally effective, such a requirement would need to be reflected in the terms and conditions of the securities on issue. An alternative could be to provide in the terms and conditions of the securities that a coupon is automatically cancelled in the event that if the securities constituted share capital on the relevant coupon payment date the issuer would have insufficient distributable reserves to pay a dividend on that coupon payment date (or provision to similar effect);
- (m) dividends/coupons that are reset periodically based on the credit rating of the issuer (i.e. a margin ratchet) are prohibited<sup>80</sup>;
- (n) the instrument cannot contribute to liabilities exceeding assets if a balance sheet test forms part of national insolvency law. In England, all debt instruments are, in principle, capable of having such an effect, although it is possible to draft the terms of an instrument so that the amount repayable in a winding up is automatically reduced *pro tanto* with the amount available to repay senior creditors. We would add that under English insolvency law, assets exceeding liabilities constitutes grounds for a court to make a winding up order, but it does not follow that it will. The Supreme Court considered it “very far from an exact test, and the burden of proof must be on the party which asserts balance-sheet insolvency”<sup>81</sup>;
- (o) neither the bank nor a related party over which the bank exercises control or significant influence must have purchased the instrument, or funded its purchase<sup>82</sup>;
- (p) the instrument must not have any features which hinder recapitalisation. An example of such an instrument given in the Basel III text is where compensation must be paid to investors if a new instrument is issued at a lower price during a specified timeframe. The EU considered that dividend stoppers hindered recapitalisation when adopting the Capital Requirements Regulation (EU) No. 575/2013. This view is not mandated



under Basel III (as seen above), although the question remains open whether the application of a dividend stopper could *in practice* hinder recapitalisation, and if it did whether this is compatible with Basel III. It seems clear that a dividend stopper *could* potentially hinder recapitalisation in that it may make the issue of new common equity less attractive in a restructuring scenario. The counterargument is that it is unfair that new junior creditors should be able to receive distributions when more senior creditors are unpaid, as they will have acquired their shares *after* and *knowing of* the prior senior issue. As there is no clearly correct solution, it is likely to be a policy choice made by national supervisors. An FAQ published by the Basel Committee states “[d]ividend stoppers that stop dividend payments on common shares are not prohibited by the Basel standards. Furthermore, dividend stoppers that stop dividend payments on other Additional Tier 1 instruments are not prohibited. However, stoppers must not impede the full discretion that a bank must have at all times to cancel distributions/payments on the Additional Tier 1 instrument, nor must they act in a way that could hinder the recapitalisation of the bank”. Examples of prohibited stoppers on additional Tier 1 instruments in FAQ 9 are: (1) attempts to stop payment on another instrument where payments on this other instrument were not also fully discretionary; (2) to prevent distributions to shareholders for a period that extends beyond the point in time that dividends/coupons on the additional Tier 1 instrument are resumed; and (3) to impede the normal operation of the bank or any restructuring activity (including acquisitions or disposals). The first two examples given are not market practice and are intended to coerce the bank into making payments on the securities in breach of the requirement that they be wholly discretionary. However, a restriction on acquisitions where the bank is not paying coupons has traditionally been viewed as acceptable, and does not immediately seem related to recapitalisation as acquisitions usually involve a reduction in cash (unless made for non-cash consideration). The FAQ would seem to suggest ordinary dividend stoppers are acceptable even if they have the practical effect of hindering recapitalisation; and

- (q) if the instrument is issued by a special purpose vehicle (“SPV”) then the proceeds must be immediately available without limitation to a single operating company, or the holding company, in a form which meets or exceeds the other criteria for inclusion in addition Tier 1 capital. This covers the situation where capital is issued by an SPV and then transferred to the bank (or its holding company). Traditionally, prior to 2010, the intra-group transfer had been made using Tier 2 or other debt. Basel III requires that the intra-group transaction takes the form of the same or better quality capital, although in the latter case it will not be recognised as higher quality capital for the bank<sup>83</sup> i.e. additional Tier 1 capital that is used to subscribed for ordinary shares.

#### *Principal loss absorbency*

- 3.3.4 Under Basel III, if an instrument is classified as a liability for accounting purposes (which most straight debt and some preference shares are) it must have a principal loss absorbency mechanism. Two alternatives are available:

- (a) conversion to common shares at an objective pre-specified trigger point of at least 5.125% of common equity Tier 1. This means that the instruments must convert into common equity if the consolidated capital ratio of the banking group, or a subsidiary bank subject to Basel III falls below 5.125%; or
  - (b) a write-down mechanism which allocates losses to the instrument at a predefined trigger point of at least 5.125%. The write-down must have the following effects:
    - (i) reduce the claim of the instrument in the liquidation of the issuer;
    - (ii) reduce the amount repaid when a call is exercised; and
    - (iii) partially or fully reduce coupon/dividend payments on the instrument<sup>84</sup>.
- 3.3.5 It is implicit in the above requirements that the write-down is permanent, and that it is not possible for the issuer to write back up the instrument out of future profits.
- 3.3.6 Non-redeemable preference shares with a discretionary coupon are equity accounted under IAS 32 with the result that they do not need to include a write-down feature under Basel III (preference shares with a mandatory coupon are not eligible as Tier 1 capital and, at best, may be treated as Tier 2 capital).
- 3.3.7 Principal “loss absorbency” is required to be achieved through conversion or write down. The idea is that when an instrument is written down the reduction of the principal amount will give rise to a non-distributable reserve that will be capable of absorbing losses. Under English company law there are restrictions on the write down of the nominal amount of preference shares in a public limited company (as a reduction in share capital by such a company may only be done if sanctioned by the court). However, it may be possible to achieve a similar outcome e.g. by conversion and re-denomination. Conversion to equity, on the other hand, is well-established, although resolutions may be required by the company in general meeting to approve an increase in share capital, grant authority to directors to allot shares and to disapply pre-emption rights.
- 3.3.8 Although the minimum trigger is 5.125%, current market practice is to view such a low common equity Tier 1 ratio as equivalent to being a gone concern. Banks may therefore choose (or be required by their supervisor, as in Switzerland) to set a higher trigger to ensure the instruments support recapitalisation in a crisis.
- 3.3.9 It should be noted that this requirement is distinct from the separate requirement for write-down or conversion at the point of non-viability that applies also to Tier 2 capital (common equity Tier 1 is exempt due to its subordinated status under company law in all jurisdictions).

*Write-down at the point of non-viability*

- 3.3.10 Basel III requires all non-core equity Tier 1 capital instruments (i.e. additional Tier 1 and Tier 2 instruments) to provide for their write-down or conversion at the point of non-viability. This reflects the observation that in the 2008-2009 financial crisis such instruments did not bear losses as expected. Where financial institutions were rescued by governments through equity capital injections, insolvency was averted. However, as Tier 1 and Tier 2 capital instruments are senior to equity they benefited directly from the new equity provided by taxpayers as opposed to bearing losses.
- 3.3.11 Moreover, as such instruments invariably contained before 2010 a dividend stopper on ordinary shares if coupons were not paid, holders often continued to receive distributions as well as avoid losses. The existence of such stoppers can, as has been discussed, be a hindrance to recapitalisation as private sector capital providers may be unlikely to invest in share capital if there is no reasonable prospect of receiving a dividend in the medium term because of the continuing obligation to make distributions on higher ranking capital instruments. Whether this should matter is, as we have seen, largely a question of supervisory policy.
- 3.3.12 As a result, the Basel Committee announced on 13 January 2011 that:
- “The terms and conditions of all non-common Tier 1 and Tier 2 instruments issued by an internationally active bank must have a provision that requires such instruments, at the option of the relevant authority, to either be written off or converted into common equity”.
- 3.3.13 These requirements are now set out in the consolidated Basel III text. For additional Tier 1 capital “[t]he terms and conditions must have a provision that requires, at the option of the relevant authority, the instrument to either be written off or converted into common equity upon the occurrence of a trigger event”<sup>85</sup>. Any compensation must be immediately paid in the form of common stock (or equivalent for mutuals, etc.) in the bank or its parent company (including any successor in resolution), and must be paid before any public sector capital contribution. According to the standard, the bank must at all times maintain prior authorisation to immediately issue the relevant number of shares required should the trigger event occur. Under English law, authorisation to issue new equity share capital (and related matters) requires consent of the members of the company in a general meeting (which, in the usual case of a publicly listed holding company of a banking group, where the new shares are issued by the ultimate holding company<sup>86</sup> is not a matter of discretion for the group but of a shareholders’ vote). Any write-down must be permanent<sup>87</sup>.
- 3.3.14 The trigger is the earlier of:
- (a) a decision that write-off, without which the bank would become non-viable, is necessary, as determined by the relevant authority; and
  - (b) the decision to make a public sector injection of capital, or equivalent support, without which the bank would have become non-viable.

- 3.3.15 Where a bank is part of a wider banking group, and the capital instrument is intended to be included in consolidated group capital the trigger is the earlier of:
- (a) a decision that a write-off is necessary, as determined by the relevant authority in the jurisdiction of incorporation of the bank (the “home jurisdiction”); and
  - (b) the decision to make a public sector injection of capital, or equivalent support, in the jurisdiction of the consolidated supervisor.
- 3.3.16 This requirement is curious as it ignores the position where the group supervisor considers that the group is non-viable but there is no public sector injection of capital<sup>88</sup>. In this case, capital issued by the bank and its holding company in the consolidated supervisor’s jurisdiction would be subject to conversion/write-off, but any capital instruments issued by subsidiary banks in other jurisdictions would not unless the subsidiary bank were itself subject to a determination of non-viability. If only the parent bank/holding company is non-viable then the securities issued by subsidiary banks subject to consolidated supervision would not convert or be written off. Presumably, this is because such institutions are still (in the view of their supervisors) viable.
- 3.3.17 Moreover, the test of “non-viability” seems to be inherently subjective. Non viability cannot be equated with insolvency on either a cash flow or a balance-sheet basis as a bank or other entity may be solvent (as Lehman Brothers Europe was ultimately proved to be) but regulators may still determine that such a firm is non-viable. As this test is undefined<sup>89</sup>, it is ultimately a question of discretion by the relevant supervisor, bounded by judicial or other legal review. In England, such a decision could only be challenged for bad faith, procedural impropriety or irrationality. Whether supervisors should have such a wide discretion to resolve a bank or its group may be open to debate.
- 3.3.18 An exception to the requirements for write-down or conversion exists if the governing jurisdiction of the bank has in place laws that (i) require such instruments to be written off upon such event, or (ii) otherwise require such instruments to fully absorb losses before taxpayers are exposed to loss. Moreover, the requirements must be disclosed by the relevant regulator and by the issuing bank in issuance documents issued on or after 1 January 2013<sup>90</sup>. An earlier requirement that a peer group review confirms that the jurisdiction conforms to these requirements has been deleted in the consolidated Basel III text.
- 3.3.19 The UK has passed legislation to facilitate the resolution of banks incorporated in the UK under the Banking Act 2009. As amended, this Act provides very extensive discretionary powers to effect the resolution of UK banks<sup>91</sup> as well as two new insolvency procedures for banks in financial difficulties. The intention is to provide the Treasury and the Bank of England with a wide range of tools to deal with failing banks.
- 3.3.20 The Act provides for the “bail-in” of regulatory capital instruments as well as other resolution powers including:

- (a) the transfer of all or part of a bank to a private sector purchaser (“PSP”);
- (b) the transfer of all or part of a bank to a “bridge bank” owned by the Bank of England; and
- (c) the transfer of a bank, or a bank holding company, into temporary public ownership (“TPO”).

3.3.21 The exception referred to is accordingly applicable to banks incorporated in England.

### 3.4 Tier 2 Capital

3.4.1 Tier 2 capital consists of the sum of the following elements:

- (a) instruments that meet the criteria for inclusion in Tier 2 capital;
- (b) share premium (if any) on Tier 2 instruments<sup>92</sup>;
- (c) instruments issued by consolidated subsidiaries of the bank that meet the requirements for inclusion in group consolidated capital as minority interests;
- (d) certain loan-loss provisions (see below); less
- (e) regulatory adjustments applied in the calculation of Tier 2 capital<sup>93</sup>.

3.4.2 The loan-loss provisions eligible for inclusion in Tier 2 capital differ depending on whether the bank applies the standardised or IRB approach to credit risk:

- (a) under the standardised approach, provisions held against future unidentified losses are eligible. However, provisions ascribed to deterioration of particular assets or known liabilities are not. Recognition of eligible reserves/provisions is restricted to 1.25% of credit risk-weighted assets, gross of tax effects<sup>94</sup>; and
- (b) under the IRB approach, where the total expected loss amount is less than total eligible provisions, the difference may be recognised as Tier 2 capital up to 0.6% of credit risk-weighted assets (or a lower percentage at national discretion)<sup>95</sup>.

3.4.3 Basel III states that “[t]he objective of Tier 2 is to provide loss absorption on a gone-concern basis”<sup>96</sup>. Where issued as debt instruments or bonds<sup>97</sup> the following criteria must be met:

- (a) they are issued and paid in;
- (b) they are subordinated to depositors and general creditors of the bank. Where issued out of a holding company, subordination applies to all general creditors<sup>98</sup>;

- (c) they are neither covered by a guarantee of the issuer or a related entity, or other arrangement that enhances their seniority, either legally or economically;
- (d) the minimum maturity is five years. Recognition is subject to amortisation in the five years prior to maturity on a straight line basis. This means that the instruments' contribution to Tier 2 capital is reduced by 20% per year reaching 0% in the final year;
- (e) there are no step-ups or other incentives to redeem the instruments;
- (f) an issuer call is permitted only after five years. All calls are subject to supervisory approval, and the bank must not do anything that creates an expectation that the call will be exercised;
- (g) a bank may only exercise a call option if the capital instrument is replaced by new capital of the same or better quality at conditions that are sustainable for the income capacity of the issuer, or the bank demonstrates that its capital position is well above its minimum capital requirement;
- (h) regulatory and tax calls are permitted within the first five years;
- (i) investors have no right to accelerate future payments except in bankruptcy or liquidation;
- (j) credit-sensitive dividend/coupon features are not allowed;
- (k) neither the bank nor a related party over which the bank exercises control or significant influence purchases the instruments. Nor may the bank directly or indirectly fund the instrument or its purchase;
- (l) if issued out of an SPV, the proceeds must be immediately available to a single operating entity, or the holding company, in a form which meets or exceeds the other criteria for Tier 2 capital; and
- (m) the terms and conditions include a provision that requires, at the option of the relevant supervisor, the instrument to be written off or converted into common equity, unless the law of the governing jurisdiction of the bank enables this to be done<sup>99</sup>. We refer to the discussion on additional Tier 1 instruments above for such principal loss absorbency, including group level recognition. As mentioned, England has such a statutory scheme.

Components of regulatory capital			
Tier 1 (going concern)	Common Equity Tier 1 (CET1)	Sum of common shares (equivalent for non-joint stock companies) and stock surplus, retained earnings, other comprehensive income, qualifying minority	CET $\geq$ 4.5%

		interests and regulatory adjustments	
	Additional Tier 1 (AT1)	Sum of capital instruments meeting the criteria for AT1 and related surplus, additional qualifying minority interests and regulatory adjustments	CET + AT1 $\geq$ 6%
Tier 2 (gone concern)		Sum of capital instruments meeting the criteria for Tier 2 and related surplus, additional qualifying minority interests, qualifying loan loss provisions and regulatory adjustments	CET + AT1 + Tier 2 $\geq$ 8%

### 3.5 Minority Interests

3.5.1 Minority (third party) interests arising from the issue of common shares by a fully consolidated subsidiary of the bank may receive recognition as common equity Tier 1 if:

- (a) the instrument meets the criteria for ordinary shares; and
- (b) the issuer is a bank or other institution subject to the *same* minimum prudential standards as a bank<sup>100</sup>. Historically, this was the case for investment firms in both the UK and EU, although the PRA (and the EU) accept that a different regime is now appropriate for all but the largest or most significant investment firms.

3.5.2 The amount of minority interests recognised is a proportion of the amount of genuine third party interests in the common equity of the subsidiary. The calculation is complicated and is based on the amount of the surplus common equity Tier 1 capital attributable to third party minority shareholders<sup>101</sup>.

3.5.3 A similar set of requirements applies to the attribution to group total Tier 1 capital and total capital provided by third party minority interests. A worked example is provided by the Basel Committee in CAP 99.

3.5.4 As we have seen, indirect issues of capital by an SPV may be included as additional Tier 1<sup>102</sup> and Tier 2 capital<sup>103</sup>. This includes capital issued by a solo consolidated SPV<sup>104</sup>.

### 3.6 Deductions from Capital

3.6.1 When it was adopted in 2010 Basel III introduced a radical overhaul to the former deductions from capital that had been unchanged since 1988.

*Goodwill and other intangibles*

- 3.6.2 Goodwill and other intangibles are deducted in full from common equity Tier 1 capital. The deduction is net of any associated deferred tax liability which would be extinguished if the intangible asset was impaired or derecognised under relevant accounting standards<sup>105</sup>. One effect of this rule is that banking groups that grow by acquisitions do not have a capital advantage over groups that grow organically. Mortgage service rights are exempted from this treatment and instead subject to the “threshold” deduction regime set out below. With prior supervisory approval, banks using local GAAP may use the IFRS definition of “intangible assets” to determine which assets are classified as intangible and subject to deduction<sup>106</sup>. The intention is to prevent differences between local GAAP and IFRS affecting the deductions that banks are required to make. If crypto-assets are accounted for as an intangible asset then they must currently be deducted from capital. The Basel Committee intends to delink the prudential treatment of crypto-asset exposures from the accounting treatment when the new prudential standard for such assets comes into force.

*Deferred tax assets (“DTAs”) and liabilities*

- 3.6.3 The treatment of DTAs and related liabilities is complex with three different approaches.
- 3.6.4 DTAs that rely on future profitability to be realised (e.g. operating losses carried forward, unused tax losses and unused tax credits) are deducted from common equity<sup>107</sup>. Such DTAs can only be realised through a reduction in future tax payments if the bank makes a profit in the future. Because of the uncertainty of future profits the Basel Committee considers that reliance on such assets as a reserve is not appropriate. Moreover, such DTAs provide no protection to depositors or government insurance funds if a bank fails or becomes insolvent.
- 3.6.5 Deferred tax liabilities may be netted provided that they relate to taxes levied by the same tax authority and offsetting is permitted by that authority<sup>108</sup>.
- 3.6.6 Deferred tax liabilities to be netted against DTAs exclude amounts netted against the deduction for goodwill, other intangibles and defined benefit pension assets. Deferred tax liabilities must be allocated pro rata between DTAs subject to deduction from common equity and those DTAs subject to threshold deductions (see below).
- 3.6.7 A separate treatment applies to DTAs arising from “temporary differences” which are subject to the threshold deductions approach referred to below. Basel III originally gave, as an example, allowances for credit losses, although this reference has now been removed.
- 3.6.8 DTAs arising from temporary differences that, under national law, are automatically transformed into a tax credit in case a bank is not profitable, is liquidated or placed under insolvency proceedings, and where the tax credit is lower than the tax liability, are fully refunded attract a 100% risk weight<sup>109</sup>.



- 3.6.9 DTAs that are a claim on a tax authority (i.e. prepayments of tax or tax receivables) are risk-weighted as a claim on the relevant government on the basis that such claims represent sovereign risk. This includes over-instalments of tax and, where so provided under local law, current year tax losses that are a receivable from the government or tax authority<sup>110</sup>. Such DTAs are not deducted as they are a debt owed to the bank as opposed to a contingent right to offset losses against future profits.

#### *Cash flow hedge reserve*

- 3.6.10 A cash flow hedge reserve that relates to the hedging of items not fair valued on the balance sheet (including projected cash flows) is excluded from common equity Tier 1. Positive items are therefore deducted while negative amounts are added back<sup>111</sup>. The reason is that the reserve reflects the fair value of the derivative entered into but not changes in the fair value of the hedged future cash flow and therefore reflects only one half of the picture, thereby generating artificial volatility in common equity<sup>112</sup>.

#### *Shortfall in provisions*

- 3.6.11 Unsurprisingly, shortfalls in provisions for expected losses must be deducted<sup>113</sup>. This is a treatment allowed under the internal ratings-based (IRB) approach followed by banks with relevant supervisory approval. Standardised banks will recognise such losses through the profit and loss account.

#### *Gain on sale of certain securitisation transactions*

- 3.6.12 Any increase in equity capital resulting from securitisations (e.g. from expected future margin income) must be deducted from capital<sup>114</sup>.

#### *Gains and losses due to changes in own credit risk*

- 3.6.13 All unrealised gains and losses that result from changes in the fair value of liabilities that are due to changes in the bank's own credit risk are excluded from regulatory capital. This applies also to accounting adjustments arising from changes in the bank's own credit risk on derivative instruments. Offsetting of valuation adjustments between a bank's own credit risk and that of its counterparties is disallowed<sup>115</sup>. In each case, there is no change in the amount of common equity capable of absorbing losses, so any notional gain or loss is disregarded.

#### *Pension fund assets and liabilities*

- 3.6.14 Defined benefit pension fund liabilities are fully deducted from the calculation of common equity. The effect is that any pension deficits are deducted from regulatory capital. Defined benefit pension fund assets recognised on the balance sheet are also deducted from common equity net of any associated deferred tax liability which would be extinguished if the asset became impaired or derecognised under applicable accounting standards<sup>116</sup>. The reason is that such assets may not be capable of being withdrawn and used to pay depositors and creditors, and are only of value in reducing future payments into the fund<sup>117</sup>. However, if the bank can satisfy its supervisor that it has unrestricted and unfettered access to surplus assets

in the fund then the bank may offset the deduction with such assets. Such offsetting assets are risk-weighted as if they were directly owned by the bank<sup>118</sup>.

#### *Investment in own shares*

- 3.6.15 All investments in own shares recognised on the balance sheet are deducted from common equity, whether directly or indirectly held<sup>119</sup>. This applies regardless of whether the position is held in the trading or banking book. The purpose of this deduction is to avoid the double counting of a bank's capital. It follows that if the applicable accounting regime does not recognise treasury shares as an asset then this deduction is not necessary<sup>120</sup>. Similarly, any shares which a bank could be contractually obliged to purchase (e.g. due to an investor call) are also deducted<sup>121</sup>. Gross long positions may only be netted against short positions if the short position involves no counterparty risk. Indirect holdings held through a position in an index are also deducted. Long and short positions may be netted, but if there is counterparty risk on the short positions, the relevant counterparty credit risk capital charge applies<sup>122</sup>. Such deductions are entirely logical as a bank's holdings of own shares provides no protection to depositors or creditors if the bank fails.
- 3.6.16 Banks' investments in their own non-core Tier 1 and Tier 2 capital is also deducted. In accordance with the "corresponding deduction" approach (see below), non-core Tier 1 instruments must be deducted from that tier of capital and own holdings of Tier 2 capital from total Tier 2 capital<sup>123</sup>. If a deduction is required to be made from a particular tier of capital, and it does not hold enough of that tier of capital, the deduction is made at the next higher tier of capital<sup>124</sup>.
- 3.6.17 G-SIBs must deduct own holdings of their TLAC instruments. If there are insufficient TLAC instruments, the deduction is made from Tier 2 capital<sup>125</sup>.

#### *Reciprocal cross-holdings*

- 3.6.18 Reciprocal cross-holdings of capital that are designed to artificially inflate the capital position of banks are deducted. Such a holding may arise if Bank A invests in the capital of Bank B, and Bank B roundtrips the money by making an investment in Bank A's capital. In such a case there is no increase in the capital held in the banking system. However, the deduction is not confined to banks and also applies to other financial institutions<sup>126</sup> and insurance companies. A corresponding deduction approach applies, with equity holdings being deducted from common equity. Reciprocal holdings of TLAC held by G-SIBs are deducted from Tier 2 capital<sup>127</sup>.

#### *Unconsolidated investments in capital instruments or TLAC issued by banks, financial institutions and insurance companies*

- 3.6.19 Any significant investments by a bank in the capital or TLAC liabilities of banking, financial or insurance entities that are not consolidated are generally deducted. Different rules apply depending on whether the bank owns less, or more, than 10% of the issued common share capital of the entity. No deduction applies to investments in consolidated affiliates as, by definition,

such investments will be netted out on consolidation and therefore disregarded when looking at the consolidated capital position.

- 3.6.20 If the bank does not own more than 10% of the ordinary shares then they must be deducted subject to a threshold. Different thresholds apply depending on whether the bank is a G-SIB, and whether those investments are in TLAC or not. For holdings above 10% see the following section on material holdings.
- 3.6.21 If the bank is not a G-SIB then the threshold is 10% of the investing bank's common equity. Holdings in aggregate equal to 10% or less of the bank's common equity (after deductions) are ignored. It follows that if the holdings amount to 14% then only 4% will be required to be deducted. A "corresponding deduction" approach applies, with common equity Tier 1 instruments deducted from common equity Tier 1, additional Tier 1 instruments from total Tier 1 and Tier 2 instruments from total capital<sup>128</sup>. The original 2010 Basel III standard explained as follows:
- "the amount to be deducted from common equity should be calculated as the total of all holdings which in aggregate exceed 10% of the bank's common equity ... multiplied by the common equity holdings as a percentage of the total capital holdings. This would result in a common equity deduction which corresponds to the proportion of total capital holdings held in common equity. Similarly, the amount to be deducted from Additional Tier 1 capital should be calculated as the total of all holdings which in aggregate exceed 10% of the bank's common equity (as per above) multiplied by the Additional Tier 1 capital holdings as a percentage of the total capital holdings".
- 3.6.22 TLAC holdings are treated differently. For non-G-SIBs, TLAC holdings equal in aggregate to less than 5% of the common equity of the investing bank (after deductions) are ignored. Holdings between 5% and below 10% of common equity are deducted from Tier 2 capital<sup>129</sup>. From 10% (after deductions) the deduction must be made from total Tier 1 or total capital<sup>130</sup>.
- 3.6.23 For G-SIBs, investments in TLAC liabilities may be ignored if: (1) the holding has been designated by the bank, (2) it is in the trading book, (3) the holding is sold within 30 business days and (4) the aggregate amount of all holdings on a gross long basis are less than the G-SIB's common equity<sup>131</sup>.
- 3.6.24 Where a holding designated under the preceding paragraph ceases to meet the criteria listed above then it must be deducted in full from Tier 2 capital. Any designated holdings cannot be included within the 10% threshold. The stated reason is to ensure deep and liquid markets in TLAC instruments<sup>132</sup>.
- 3.6.25 Holdings by a G-SIB not subject to the preceding two paragraphs which exceed 10% of the investing G-SIB's common equity (after deductions) are subject to deduction from either Tier 1 or Tier 2 capital<sup>133</sup> (as applicable under the corresponding deduction approach with TLAC holdings deducted from Tier 2 capital).
- 3.6.26 Where a bank, subject to the above rules, does not have enough of a particular tier of capital to make the deduction, it must be deducted from the next highest tier of capital<sup>134</sup>.

- 3.6.27 Amounts not deducted are risk weighted. Instruments held in the trading book are subject to the market risk rules and investments in the banking book are treated under the standardised or IRB approach to credit risk (as appropriate)<sup>135</sup>.
- 3.6.28 In calculating whether any investment is subject to the above paragraphs as being less than 10% of the issued common shares of the banking, financial or insurance entity which the bank invests in, the following rules apply. Investments include direct, indirect or synthetic holdings, as elsewhere. Holdings in both the banking and trading books are aggregated. The calculation is made based on the net long position (where the maturity of short positions either matches that of the long, or has a residual maturity of at least one year). Underwriting positions in capital instruments or TLAC held for five working days or less are ignored. Any capital instruments in which a bank invests that does not meet the criteria for common equity, additional Tier 1 instruments or Tier 2 instruments are treated as common shares. This seems to require banks to treat as common equity for the application of the relevant limits any capital instruments (in the sense that they form part of the capital of the issuer) that are non-compliant with the Basel III requirements. Finally, national authorities may allow banks to disregard investments made, with supervisory approval, in the context of resolving or providing financial assistance to reorganise a distressed institution<sup>136</sup>.

#### *Material holdings*

- 3.6.29 A material holding is, basically, an investment of 10% or more in the shares, capital or TLAC of a bank, financial institution or insurance company. The rules on material holdings are not relevant to consolidated affiliates for the reasons given in the preceding section. Non-consolidated affiliates are, however, subject to these rules. An “affiliate” for these purposes is “a company that controls, or is controlled by, or is under common control with, the bank”. Control is defined as “(1) ownership, control, or holding a power to vote 20% or more of a class of voting securities of the company; or (2) consolidation of the company for financial reporting purposes”<sup>137</sup>.
- 3.6.30 All investments in capital instruments above 10% that are common shares are subject to the treatment set out in respect of “threshold” deductions below<sup>138</sup>. Curiously, the effect is to impose a less onerous treatment on individual holdings of more than 10% in common equity than positions in additional Tier 1 or Tier 2 instruments that are less risky (because they enjoy a higher ranking on an insolvency). This was one of the compromises reached as part of the negotiations on Basel III.
- 3.6.31 All other investments in capital instruments (additional Tier 1, Tier 2) or TLAC must be fully deducted applying a threshold deduction approach: i.e. additional Tier 1 is deducted from additional Tier 1 and Tier 2 and TLAC holdings from Tier 2 capital. If a bank does not have enough of a relevant tier of capital in which it is required to make a deduction, the deduction is made at the next higher tier of capital (so a shortfall in additional Tier 1 will result in a deduction from common equity Tier 1)<sup>139</sup>.
- 3.6.32 The rules on calculating the size of holdings are basically the same as for holdings below the threshold. Thus, direct, indirect and synthetic holdings of

capital or TLAC are included. For index securities, banks are required to look through the index and disaggregate its component securities. Holdings in both the banking and trading book are included, with the net long position being relevant. Underwriting positions may be excluded if held for five working days or less. Capital instruments that do not meet the criteria under Basel III are treated as common equity, and national supervisors may exclude holdings in the context of the reorganisation of a distressed institution<sup>140</sup>.

#### *Threshold deductions*

- 3.6.33 Reference has been made above to “threshold” deductions. Under Basel III the following may each receive limited recognition when calculating a bank’s common equity:
- (a) significant investments in the common shares of unconsolidated banks, financial institutions and insurance companies (valued based on their balance sheet value);
  - (b) mortgage servicing rights; and
  - (c) DTAs arising from temporary differences.
- 3.6.34 The amount of all the three items that remains after application of all regulatory adjustments must not exceed 15% of common equity calculated after all regulatory adjustments (i.e. in both cases deductions from capital)<sup>141</sup>. A 10% threshold applies to any individual item<sup>142</sup>. To determine the maximum recognition of the specified items the amount of common equity is multiplied by 17.65% (being the ratio of 15% to 85%). Holdings of any of these items above the 10% or 15% thresholds are deducted from capital<sup>143</sup>.
- 3.6.35 Any holdings not deducted under this section are subject to a 250% risk weight<sup>144</sup>.
- 3.6.36 This treatment was the result of extensive debate within the Basel Committee during the finalisation of the Basel III standard, and represents a compromise between those members which wished to see all such assets deducted in full and those who considered such an approach was not justified.

## 4. THE STANDARDISED APPROACH TO CREDIT RISK

### 4.1 Standardised Credit Risk approach under Basel III

- 4.1.1 The standardised approach to credit risk applies to all banks that do not have regulatory permission to apply an internal ratings-based (“IRB”) approach for credit risk. Market risk is addressed in a later chapter. The standardised approach under Basel III is ultimately derived from Basel I, although it is considerably more sophisticated. Also, the published risk weights are only indicative, unlike under Basel I or Basel II. However, the basic structure of the 1988 Capital Accord is retained in the standardised approach, albeit with many modifications and much greater risk sensitivity. Banks still determine risk weighted assets by multiplying the size of each exposure by a counterparty risk weight, subject to adjustment where required. The intention is that capital charges will closely reflect the credit risk incurred. However, unlike the internal ratings-based approach, there are a limited number of risk buckets, and hence different capital charges.

Credit risk, the risk of loss due to a borrower being unable to repay a debt in full or in part, accounts for the bulk of most banks’ risk-taking activities and regulatory capital requirements. There are two broad approaches to calculating RWAs for credit risk: the **standardised approach** and the **internal ratings-based approach**.

The Committee’s revisions to the standardised approach for credit risk under Basel III seek to enhance the regulatory framework by:

- improving its granularity and risk sensitivity. For example, in the revised standardised approach, mortgage risk weights depend on the loan-to-value (LTV) ratio of the mortgage;
- reducing mechanistic reliance on credit ratings, by requiring banks to conduct sufficient due diligence, and by developing a sufficiently granular non-ratings-based approach for jurisdictions that cannot or do not wish to rely on external credit ratings; and
- providing the foundation for a revised output floor to internally modelled capital requirements (to replace the existing Basel I floor) and related disclosure to enhance comparability across banks and restore a level playing field.

- 4.1.2 Risk weighted assets are calculated as the product of standardised risk weights and the exposure amount, net of specific provisions and write-offs<sup>145</sup>. The application of the standardised approach differs depending on whether the home state supervisor allows use of external credit ratings, or not. This is a result of the 2008-9 financial crisis, where banks’ reliance on credit ratings was criticised as a result of the poor performance of certain credit ratings and concerns about rating agency competence. External ratings came under further challenge during the Eurozone crisis of 2010-2012, which was interpreted, at the time, as a sovereign debt crisis. As a result, under the Basel framework, countries are free either to permit, or not, the use of external credit ratings, but the use of ratings is stated to be no justification

for banks not undertaking their own due diligence. In retrospect, it seems that most of the ratings that gave rise to concerns during the financial crisis were concentrated in a limited number of sectors: securitisation, re-securitisation and structured finance<sup>146</sup>. Sovereign debt is more complex, and there are undoubtedly many lessons still to learn from the Eurozone crisis. The ratings assigned to Greek sovereign debt before the crisis were too high, but no other Eurozone sovereign has yet suffered a debt restructuring. Perhaps the greatest problem in both crises was not the use of credit ratings as such but the unthinking reliance on such ratings. The problems of the Eurozone in 2010-2012 were not properly attributable to rating agency failures but to structural deficiencies in the construction of economic and monetary union set out in the Maastricht Treaty (1992) and not addressed in subsequent EU treaty revisions.

- 4.1.3 All ratings given below are, following the Basel III text, taken from Standard and Poor's. Other rating agencies' ratings are allowed, and the text states that "[t]he ratings used throughout this document, therefore, do not express any preferences or determinations on external assessment institutions by the Committee"<sup>147</sup>.
- 4.1.4 Under Basel III "banks must perform due diligence to ensure that they have an adequate understanding, at origination and thereafter on a regular basis (at least annually), of the risk profile and characteristics of their counterparties. In cases where ratings are used, due diligence is necessary to assess the risk of the exposure for risk management purposes and whether the risk weight applied is appropriate and prudent. The sophistication of the due diligence should be appropriate to the size and complexity of banks' activities"<sup>148</sup>. Where banks lend to a member of a corporate group "due diligence should, to the extent possible, be performed at the solo level to which there is a credit exposure"<sup>149</sup>. However, "banks are expected to take into account the support of the group and the potential for it to be adversely impacted by problems in the group"<sup>150</sup>. In reality, most banks reasonably rely on express or implied support by corporate groups for their operating entities. This is also recognised by rating agencies. Basel III also required banks to apply "effective internal policies, processes, systems and controls to ensure that risk weights are assigned to counterparties" and "be able to demonstrate to their supervisors that their due diligence analyses are appropriate"<sup>151</sup>. It remains to be seen how this will be applied in practice.

## 4.2 Sovereign Exposures

- 4.2.1 Basel III sets out two alternative methods for determining the counterparty risk weight for sovereign exposures. The first method is based on the external credit rating of the sovereign. Under this method, national supervisors may adopt a lower risk weight for exposures denominated and funded in the domestic currency (i.e. the bank has corresponding liabilities denominated in the domestic currency)<sup>152</sup>. The counterparty risk weights for sovereigns and central banks under this method are set out in the table below<sup>153</sup>.

External rating	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk weight	0%	20%	50%	100%	150%	100%

- 4.2.2 As an alternative, national supervisors may permit banks to use country risk scores assigned by national export credit agencies (ECAs). The ECAs must either be those recognised by their supervisor, or the consensus risk scores of ECAs participating in the OECD *Arrangement on Officially Supported Export Credits*<sup>154</sup>. The risk weights are set out below<sup>155</sup>.

ECA risk score	0-1	2	3	4 to 6	7
Risk weight	0%	20%	50%	100%	150%

### 4.3 Public Sector Entities

- 4.3.1 Claims on domestic public sector entities (“PSEs”) are the subject of two alternative treatments (the choice of which is up to the relevant supervisor in the jurisdiction concerned)<sup>156</sup>.

#### Option 1

Credit assessment of sovereign	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk weight under option 1	20%	50%	100%	100%	150%	100%

The second option bases the risk weight directly on the credit rating of the PSE.

#### Option 2

Credit assessment of PSE	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
Risk weight under option 2	20%	50%	50%	100%	150%	50%

- 4.3.2 Subject to national discretion, PSEs may be treated as sovereign exposures. Where this discretion is exercised, other national supervisors may allow their banks to apply the same treatment to their banks’ PSE exposures in that jurisdiction<sup>157</sup>. An example given by the Basel Committee of where this may be appropriate is where PSEs have revenue-raising powers, or are guaranteed by the central government, although the choice is up to the national supervisor. In the UK, local authorities do have statutory revenue-raising powers (through council tax), although they do not benefit from any central government guarantee of their indebtedness, and traditionally have not been treated as equivalent to sovereign exposures. The Scottish, Northern Ireland and Welsh governments have been treated as sovereign exposures.



Commercial undertakings that are publicly owned may be treated as other corporates<sup>158</sup>, and in practice are in the UK.

#### 4.4 International Organisations

- 4.4.1 Claims on the Bank for International Settlements (BIS), the International Monetary Fund (IMF), the European Central Bank (ECB), the European Union, the European Stability Mechanism (ESM) and the European Financial Stability Fund (EFSF)<sup>159</sup> may receive a 0% risk weight<sup>160</sup>. A 0% weight also applies to claims on multi-lateral development banks (MDBs) which the Basel Committee judges meet specified criteria, including very high-quality issuer ratings, shareholder structure, shareholder support and lending requirements<sup>161</sup>.
- 4.4.2 The current list of 0% risk weighted MDBs is: the World Bank Group (International Bank for Reconstruction and Development, the International Finance Corporation, the Multilateral Investment Guarantee Agency and the International Development Agency), the Asian Development Bank, the African Development Bank, the European Bank for Reconstruction and Development, the Inter-American Development Bank, the European Investment Bank, the Islamic Development Bank, the Council of Europe Development Bank, the International Finance Facility for Immunization and the Asian Infrastructure Investment Bank.
- 4.4.3 Other MDBs (e.g. the Development Bank of Latin America, the Caribbean Development Bank and the Nordic Development Bank) attract the following “base” risk weights.

External rating	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-	Unrated
“Base” risk weight	20%	30%	50%	100%	150%	50%

- 4.4.4 Where a jurisdiction does not allow the use of external ratings, a 50% risk weighting applies<sup>162</sup>.

#### 4.5 Bank exposures

- 4.5.1 Basel III sets out two methods for determining the counterparty risk weight for exposures to banks depending on whether the use of external credit ratings is permissible in the relevant jurisdiction<sup>163</sup>. The option of basing risk weights on those applicable to the sovereign of incorporation under Basel II has been withdrawn.

##### *Option 1*

In jurisdictions that permit the use of external credit ratings the following “base” risk weights apply<sup>164</sup>.

External rating of counterparty	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-
“Base” risk weight	20%	30%	50%	100%	150%
Risk weight for short-term exposures	20%	20%	20%	50%	150%

- 4.5.2 Banks are expected under Basel III not to mechanically rely on external ratings and must perform due diligence to ensure that the external ratings appropriately reflect the creditworthiness of the bank’s counterparties. If the due diligence reflects higher risk characteristics than that implied by the external rating bucket of the exposure, the bank must assign a risk weight at least one bucket higher than the “base” risk weight. Due diligence analysis can never result in the application of a lower risk weight than that determined by the external rating<sup>165</sup>.
- 4.5.3 The category for short-term exposures applies to exposures with an original maturity of three months or less, as well as exposures with an original maturity of six months or less arising from the movement of goods across national borders (including relevant off-balance sheet exposures such as self-liquidating trade-related contingent items)<sup>166</sup>. Off-balance sheet items are described below.
- 4.5.4 Unrated exposures are treated under Option 2 detailed below. This includes ratings issued by a rating agency not recognised by a national supervisor, or not chosen to be used by a bank when assigning risk weights. Any “implicit” support expected to be extended by a government to a particular bank must be excluded unless it is a public bank owned by its government. Basel III, however, allows the continued use of external ratings that incorporate assumptions of implicit government support for five years after the new standard comes fully into force (which in this case will be until 1 January 2028)<sup>167</sup>.

#### Option 2

The second option applies both in jurisdictions that do not permit the use of external ratings as well as for unrated exposures in other jurisdictions. Banks must classify their bank exposures into one of three risk-weight buckets: A, B and C<sup>168</sup>. The risk weights are given in the table below<sup>169</sup>.

Risk weight table for bank exposures			
Credit risk assessment of counterparty	Grade A	Grade B	Grade C
“Base” risk weight	40%	75%	150%
Risk weight for short-term exposures	20%	50%	150%

- 4.5.5 Exposures to unrated banks may receive a 30% risk weight provided the counterparty has a common equity Tier 1 ratio which is 14% or higher and a Tier 1 leverage ratio which is 5% or higher<sup>170</sup>.
- 4.5.6 The allocation of exposures to risk-weight buckets is as follows:
- (a) Grade A refers to exposures to banks with adequate capacity to meet their financial commitments (including payments of principal or interest) in a timely manner irrespective of economic cycles or business conditions<sup>171</sup>. Grade A banks must meet or exceed their minimum capital requirements (including capital buffers) with the exception of any adjustments made under Pillar 2 (the supervisory review process) to increase the minimum requirement. However, if the minimum capital requirement (and buffers) are not made public, then the bank is assessed as Grade B or below<sup>172</sup>. If internal due diligence results in an assessment that the bank does not meet the definition of Grade A exposures, then the exposures are placed into Grade B or C<sup>173</sup>.
  - (b) Grade B refers to exposures to banks where the counterparty bank is subject to substantial credit risk, such as a repayment capability dependent on stable or favourable economic or business conditions<sup>174</sup>. Grade B banks must meet their minimum regulatory capital requirement. However, they may not satisfy their capital buffer requirements or unpublished Pillar 2 adjustments. If this requirement is not met, or the requirements are not publicly disclosed, the exposures are allocated to Grade C<sup>175</sup>. Banks that fail to meet the criteria for Grade A and are not classified as Grade C exposures fall into Grade B<sup>176</sup>.
  - (c) Grade C refers to higher credit risk exposures where the bank has material default risks and limited margins of safety. Adverse business, financial or economic conditions are very likely to lead to an inability to meet financial commitments<sup>177</sup>. Specific examples of Grade C banks are where the bank fails to meet its minimum regulatory capital requirements (exclusive of buffers) or where the auditors express substantial doubt whether the bank can continue as a going concern<sup>178</sup>. Even where these criteria are not met a bank may assess its counterparty to be Grade C<sup>179</sup>.
- 4.5.7 Where Option 2 is required to be used then the risk weight of the sovereign of incorporation of the counterparty may act as a floor to the risk weighting set out when applying the grades described above. The floor is applicable where: (i) the exposure is not in the local currency of incorporation or (ii) the borrowing is booked in a branch of the bank in a foreign jurisdiction and the exposure is in a currency other than the currency of the jurisdiction where the branch operates. Curiously, for exposures in euro this does not reflect the risk arising from the fact that no Eurozone member can control “its” domestic currency, unlike Japan or the US as the ECB is constitutionally independent of any EU member state. This floor does not apply to self-liquidating trade-related contingent items with a maturity below one year<sup>180</sup>.

## 4.6 Covered Bonds

- 4.6.1 Exposures in the form of covered bonds attract a reduced risk weighting to reflect their lower risk owing to the existence of collateral specifically available to meet repayments under the bonds. To qualify, the bonds must be subject by law to special public supervision designed to protect bondholders. The proceeds must be invested in assets which during the whole period of validity of the bonds are capable of meeting claims under the bonds, and which in an insolvency are available on a priority basis to make repayments<sup>181</sup>.
- 4.6.2 The asset pool must be invested in: (1) claims on, or guaranteed by, sovereigns, central banks, PSEs or MDBs; (2) residential mortgage claims that meet specified criteria and have a loan-to-value of 80% or lower; (3) commercial mortgage claims that meet the same criteria and have a loan-to-value of 60% or less; or (4) claims on, or guaranteed by, banks with a 30% risk-weight under the standardised approach (subject to a 15% cap on covered bond issuances)<sup>182</sup>.
- 4.6.3 The assets backing the covered bond must exceed the nominal outstanding value by at least 10%. This need not be a statutory requirement, however, provided that the bank meets it in practice and makes the requisite disclosures<sup>183</sup>.
- 4.6.4 There are also specified disclosure requirements which will not be set out here<sup>184</sup>.
- 4.6.5 The applicable risk weights for eligible covered bonds are as follows<sup>185</sup>. There is no specific treatment for covered bonds where the jurisdiction does not recognise the use of external ratings, perhaps because it is not currently relevant.
- 4.6.6 In the case of unrated bonds, the issuer’s rating is inferred from the risk weights in the table below<sup>186</sup>.

Risk weight table for rated covered bond exposures					
Issue-specific rating of the covered bond	AAA- to AA-	A+ to A-	BBB+ to BBB-	BB+ to B-	Below B-
“Base” risk weight	10%	20%	20%	50%	100%

Risk weight table for unrated covered bond exposures							
Risk weight of the issuing bank	20%	30%	40%	50%	75%	100%	150%
“Base” Risk weight	10%	15%	20%	25%	35%	50%	100%

- 4.6.7 The same requirement for due diligence applies to inter-bank exposures, with the possibility of upward revision of risk weights where justified<sup>187</sup>.

## 4.7 Exposures to Securities Firms and other Financial Institutions

4.7.1 Exposures to such institutions are treated as inter-bank exposures provided that such firms are subject to prudential standards and a level of supervision equivalent to banks (including capital and liquidity standards). The assessment of this is up to national supervisors, and where such equivalence is determined to exist, other supervisors may allow their banks to apply the same treatment. In all other cases, the exposures are treated as corporate exposures<sup>188</sup>. It is unclear whether the new prudential framework for securities firms will meet this requirement, and, traditionally, liquidity has not been a major feature of such regulation given the assumed liquidity of trading positions<sup>189</sup>. A finding of equivalence may be even more challenging for insurance companies given the different regulatory frameworks world-wide for insurers.

## 4.8 Corporate Exposures

4.8.1 The risk weights for claims on corporates (including, most likely, insurance companies<sup>190</sup>) depend on whether the exposure is a general corporate exposure or constitutes “specialised lending” (e.g. project finance). Subordinated debt and equity holdings are excluded from the corporate asset class and subject to a bespoke treatment for equity exposures<sup>191</sup>.

### *General corporate exposures*

4.8.2 The regulatory capital treatment differs depending on whether the jurisdiction of incorporation permits the use of external credit ratings.

4.8.3 “Base” risk weightings for jurisdictions that *do* allow external ratings to be used are given below<sup>192</sup>.

External rating of counterparty	AAA to AA-	A+ to A-	BBB+ to BBB-	BB+ to BB-	Below BB-	Unrated
“Base” risk weight	20%	50%	75%	100%	150%	100%

4.8.4 As with other exposure classes, banks must perform due diligence that may result in the application of less favourable risk weights based on an assessment of the exposure having higher risk<sup>193</sup>.

4.8.5 Where the national supervisor does not allow the use of external ratings, then, as a general matter, a cross-the-board 100% risk weight applies<sup>194</sup>. A lower risk weighting may be applied to “investment grade” exposures (as follows)<sup>195</sup>. An exposure is treated as investment grade if the issuer has “adequate capacity to meet its financial commitments in a timely manner and its ability to do so is assessed to be robust against adverse changes in the economic cycle and business conditions”<sup>196</sup>. Investment grade borrowers must have securities (debt or equity) outstanding on a recognised securities exchange<sup>197</sup>. Exposures to investment grade borrowers attract a 65% risk weight<sup>198</sup>.

*Specialised lending*

- 4.8.6 This asset class covers corporate borrowers that possess some or all of the following characteristics, either in legal form or economic substance:
- (a) the exposure is not related to real estate and is either object finance, project finance or commodities finance;
  - (b) the exposure is typically to an entity (such as an SPV) specifically created to finance and/or operate physical assets;
  - (c) the borrower has few of no other material assets or activities, and therefore little or no independent capacity to repay apart from income received from the assets being financed; and
  - (d) the lender(s) has a substantial degree of control over the assets and the income generated<sup>199</sup>.
- 4.8.7 For these purposes, the following definitions apply:
- (a) **Project finance** is a method of funding in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the loan.
  - (b) **Object finance** refers to the method of funding the acquisition of equipment (e.g. ships, aircraft, satellites, railcars) where repayment of the loan is dependent on the cash flows generated by the specific assets financed and charged to the lender.
  - (c) **Commodities finance** refers to short-term lending to finance reserves, inventories or receivables of commodities traded on an exchange (e.g. oil, metals or crops), where the loan will be repaid from the proceeds<sup>200</sup>.
- 4.8.8 The risk weighting for rated issue-specific ratings (not issuer ratings) is the same as for general corporate loans *provided that* the relevant jurisdiction accepts the use of external ratings<sup>201</sup>. If no issue-specific rating is available, or if the relevant jurisdiction does not allow the use of external ratings, the following risk weights apply:
- (a) object and commodities finance exposures are risk-weighted at 100%;
  - (b) project finance exposures are risk-weighted at 130% during the pre-operational phase and 100% during the operational phase; and
  - (c) project finance exposures in the operational phase deemed to be “high quality” are risk-weighted at 80%<sup>202</sup>.
- 4.8.9 Project finance exposures are deemed to be “high quality” if the following criteria are met:
- (a) the borrower is able to meet its financial commitments in a timely manner and its ability to do so is robust against adverse changes in the economic cycle and business conditions;

- (b) the borrower may not act to the detriment of the creditors e.g. by issuing new debt without the consent of the creditors;
- (c) the borrower has sufficient reserves/other arrangements to cover contingency funding and working capital requirements;
- (d) the revenues are availability-based or subject to rate-of-return regulation;
- (e) the borrower's revenue depends on one main counterparty that is a sovereign, PSE or corporate with a risk-weight of 80% or lower;
- (f) the contractual documentation provides for a high degree of protection for creditors in a default (e.g. through extensive security);
- (g) the main counterparty, or other counterparties, will protect the creditors if the project is terminated;
- (h) all assets and contracts necessary to operate the project have been charged to the creditors to the extent permitted by applicable law; and
- (i) creditors may assume control of the borrower in case of its default<sup>203</sup>.

#### *Corporate SME lending*

4.8.10 A preferential risk weight is applied to corporate lending to small and medium sized companies (SMEs). The definition of an SME is sales of €50 million or less. Corporate SME lending that meets the criteria for retail SME lending is treated as retail SME lending and risk-weighted at 75%. Rated exposures to corporate SMEs where the national supervisor allows use of external ratings is treated as a general corporate exposure. Unrated exposures, where external ratings are permitted, and all exposures to corporate SMEs where use of external ratings is not permitted, attract an 85% risk weight<sup>204</sup>.

## **4.9 Subordinated Debt and other Capital Instruments**

4.9.1 The treatment of subordinated debt and holdings of capital instruments is a residuary category where another treatment prescribed by Basel III does not apply. In practice, this means the following:

- (a) where holdings of such instruments must be deducted from capital, no risk weight applies (to avoid double counting);
- (b) if a 250% risk weight applies under the "threshold" deductions approach considered in the previous chapter, then that risk-weight must be applied; and
- (c) if a 1250% risk weight for such investments applies as a significant holding in a commercial entity, then that risk-weight applies<sup>205</sup>.

4.9.2 Any holdings of subordinated debt or other capital instruments, whether issued by a bank, financial institution, or a corporate are subject to this treatment. It follows that for non-banks, the reference to capital instruments

means the equivalent for the relevant issuer<sup>206</sup>. This class also includes investments in TLAC that are not required to be deducted from regulatory capital<sup>207</sup>.

4.9.3 Equity investments in funds are treated as other fund exposures<sup>208</sup>.

#### 4.10 Equity Exposures

4.10.1 The definition of “equity” under the standardised approach is based on economic substance and not legal form, and comprises both direct and indirect investments. The definition of equity for this purpose is as follows:

- (a) it is irredeemable in that a return of the capital investment can only be achieved on sale or in a liquidation;
- (b) it does not embody an obligation on the part of the issuer<sup>209</sup>; and
- (c) it conveys a residual claim on the assets or income of the issuer<sup>210</sup>.

4.10.2 In addition to the above, the following instruments are classified as equity exposures (regardless of their form):

- (a) instruments with the same structure as Tier 1 capital of banks; and
- (b) instruments constituting an obligation of the issuer where any of the following conditions are met:
  - (i) the issuer may indefinitely defer settlement;
  - (ii) the obligation requires or permits the issuer to settle the obligation by a fixed number of shares;
  - (iii) the obligation requires or permits the issuer to settle the obligation by a variable number of shares; or
  - (iv) the holder may require settlement in shares (e.g. convertible debt), unless the relevant national supervisor is satisfied that the instrument should be treated as debt<sup>211</sup>.

4.10.3 The equity class also includes debt obligations structured with the intent of conveying the economic substance of equity. On the other hand, instruments that are legally considered to be equity, but are structured to convey the economic substance of debt, or a securitisation position, are not treated as equity<sup>212</sup>. An example might be a dated must pay preference share.

4.10.4 The risk weight for equity positions as defined above depends on whether the instrument is considered to be a speculative unlisted equity position or not. The definition of a speculative unlisted equity position is “equity investments in unlisted companies that are invested for short-term resale purposes or are considered venture capital or similar investments which are subject to price volatility and are acquired in anticipation of significant future capital gains”<sup>213</sup>. Long-term investments in unlisted equity of corporate clients, or debt-equity swaps acquired as a result of a restructuring are excluded<sup>214</sup>.



- 4.10.5 Speculative unlisted equity positions are risk-weighted at 400%. Subject to the next paragraph, all other equity positions attract a 250% risk weight<sup>215</sup>.
- 4.10.6 Basel III allows a lower - 100% - risk-weighting where the equity holding is acquired pursuant to a national programme set out in legislation that provides significant subsidies to equity investments and involves government oversight and restrictions on the investments. A 100% risk-weight is applied to holdings up to an aggregate amount of 10% of the investment bank's total capital (Tier 1 plus Tier 2)<sup>216</sup>.
- 4.10.7 For such investments, the risk-weight is 150%.

#### 4.11 Qualifying Holdings

- 4.11.1 A qualifying holding is defined as either a significant minority investment in a commercial (i.e. non-banking or other financial) entity, or a majority holding/control over such a commercial entity. It is unclear for this purpose whether significant investments in insurance companies are treated as financial or, as provided for in other parts of Basel III, corporate exposures.
- 4.11.2 Where a bank or banking group has such qualifying holdings then the following two materiality thresholds apply:
- (a) 15% of the bank's capital for any *individual* investment in a single entity; or
  - (b) 60% of the aggregate of the bank's capital for *all* such significant investments<sup>217</sup>.
- 4.11.3 It is implicit that the definition "total capital" means the sum of Tier 1 and Tier 2 capital of the investing bank.
- 4.11.4 If either of the thresholds is reached then the following treatment applies. All investments above the thresholds are subject to a risk weighting of 1250%<sup>218</sup>. With an 8% minimum capital ratio under Basel III this is the equivalent of requiring a deduction from capital. All investments below the thresholds set out above are treated as equity exposures described.

#### 4.12 Retail Exposures

- 4.12.1 Retail exposures *exclude* real estate exposures (i.e. retail mortgage lending)<sup>219</sup>. They are therefore composed of the following:
- (a) Exposures to an individual or individuals; and
  - (b) SME exposures (retail or corporate) that satisfy the definition of the "regulatory retail" portfolio (see below)<sup>220</sup>.
- 4.12.2 Retail exposures are, in turn, divided into three sub-categories:
- (a) The "regulatory retail" portfolio (other than exposures with "transactors");
  - (b) Exposures within the "regulatory retail" portfolio with "transactors"; and

- (c) All other retail exposures<sup>221</sup>.

#### *The regulatory retail portfolio*

- 4.12.3 A retail or SME exposure will only fall within the “regulatory retail” portfolio if *all* of the following criteria are met:
- (a) **Product criterion.** The exposure takes the form of: (i) revolving credits and lines of credit (including credit cards, charge cards and overdrafts); (ii) personal term loans and leases (e.g. instalment loans, auto loans and leases, student loans, personal finance); and (iii) small business facilities. Mortgage loans, derivatives, bonds and securities are expressly excluded;
  - (b) **Value.** The maximum aggregate exposure to one borrower cannot exceed €1 million; and
  - (c) **Granularity.** No individual obligor may exceed 0.2% of the overall regulatory retail portfolio<sup>222</sup>. For this purpose, *all* loans to an obligor are aggregated, whether they are “regulatory retail” exposures or not. Thus, any mortgage loans will be aggregated to determine whether this threshold is met. Equally, in the case of SME exposures, all lending to affiliates (such as other group companies) must be aggregated<sup>223</sup>.
- 4.12.4 Exposures to individuals and SMEs that fall within this category and are not with “transactors” (as to which, see below) receive a risk-weight of 75%<sup>224</sup>.

#### *Transactors*

- 4.12.5 This category is a subset of the “regulatory retail” portfolio of exposures. All of the requirements for an exposure to be allocated to the regulatory retail portfolio set out above must be met. In addition, the bank must classify the obligor as being a “transactor”. A “transactor” is an obligor of a facility such as a credit card or charge card where the full balance is repaid at each scheduled repayment date over the previous 12 months<sup>225</sup>. It follows that if there is a delay of one day in any monthly repayment, or if any part of the balance is rolled over from one month to another, this definition will not be met. In the case of overdrafts, a facility is treated as being with a “transactor” if there has been no drawdown over the previous 12 months<sup>226</sup>. As all of these exposures are revolving, it seems clear that only revolving exposures are eligible to be included within the specific treatment for “transactors”.
- 4.12.6 Exposures to transactors within the regulatory retail portfolio attract a risk weight of 45%<sup>227</sup>.

#### *Other retail exposures*

- 4.12.7 This is a residual class encompassing all retail exposures that do not satisfy the definition of the “regulatory retail” portfolio, and are not real estate exposures<sup>228</sup>. As SME exposures can only be treated as retail if they fall within the definition of “regulatory retail” exposures, it follows that this class is confined to exposures to individuals. An example would be an unsecured loan,

or a loan secured on securities or other financial instruments or commodities that exceeds €1 million.

4.12.8 The risk weight is 100%<sup>229</sup>.

#### 4.13 Real Estate Exposures

4.13.1 As real estate lending was at the heart of the 2007-9 financial crisis one might have expected major changes to the capital treatment. Although the treatment under Basel III is considerably more detailed and granular than its predecessor in Basel II, the main changes relate to the loan-to-value of mortgage loans. Relatively few changes have been made under the standardised approach to address the poor quality lending that manifested itself in the run-up to the crisis.

4.13.2 This class of exposures is sub-divided into the following three sub-portfolios:

- (a) the “regulatory real estate” portfolio;
- (b) the land acquisition, development and construction (ADC) portfolio; and
- (c) other real estate loans<sup>230</sup>.

4.13.3 A diagram at the end of this section summarises the relevant requirements and may be of assistance in following the description of the rules in this section.

4.13.4 Each of the three sub-portfolios will now be considered.

##### *The “regulatory real estate” portfolio*

4.13.5 This category seem inspired by the “regulatory retail” portfolio considered above. Under Basel III it is defined as consisting of:

- (a) “regulatory residential real estate” exposures that are not materially dependent on cash flows generated by the property;
- (b) “regulatory residential real estate” exposures that are materially dependent on cash flows generated by the property;
- (c) “regulatory commercial real estate” exposures that are not materially dependent on cash flows generated by the property; and
- (d) “regulatory commercial real estate” exposures that are materially dependent on cash flows generated by the property<sup>231</sup>.

4.13.6 It follows that in establishing the correct risk weight there are two relevant sub-divisions: one between residential and commercial real estate lending, and a second by whether or not the exposure is materially dependent on cash flows generated by the property charged to the lender.

4.13.7 All exposures within this class must satisfy the following criteria to be eligible as “regulatory” real estate lending:

- (a) **finished property.** The property must be fully completed (unless the loan is secured by forest or agricultural land). National supervisors may include within this category unfinished property under construction where: (i) the property is a one-to-four family residential housing unit that will be the primary residence of the borrower; or (ii) the national sovereign or a PSE have legal powers and an ability to ensure that the property is finished<sup>232</sup>. This seems a curious category as unless all the units in the building or development have been pre-sold how can the lender *know* that the purchasers will all be owner-occupiers? It is also unclear whether the units must all form part of the same building or can be separate houses or developments, although the latter would seem more logical. Why the size of the development is capped at four units is unclear. The second limb of the exception for uncompleted property refers to a sovereign or PSE having power to complete the development. Whilst a sovereign could certainly take powers to complete unfinished real estate as eminent domain, it seems unlikely that most governments would seek to engage in such activities. As for PSEs, again it seems unlikely that local governments would engage in such activity, although companies such as the US government-sponsored entities Fannie Mae and Freddie Mac might perhaps do so.
- (b) **legal enforceability.** The mortgage over the property must be legally enforceable in all relevant jurisdictions, and the lender must be able to realise its security interest within a reasonable period of time<sup>233</sup>. As land is immovable, the reference to “relevant” jurisdictions should, in almost all cases, mean the jurisdiction where the land is situated and where the charge can be enforced, although in some cases foreign registration laws may also be relevant e.g. for commercial secured property lending.
- (c) **claims over the property.** The lender must generally hold a first “lien”<sup>234</sup> over the property. However, “in jurisdictions where junior liens provide the holder with a claim for collateral that is legally enforceable and constitute an effective credit risk mitigant, junior liens held by a different bank than the one holding the senior lien may also be recognised”<sup>235</sup>. To be recognised “the national frameworks governing liens should ensure the following: (i) each bank holding a lien on a property can initiate the sale of the property independently from other entities holding a lien on the property; and (ii) where the sale of the property is not carried out by means of a public auction, entities holding a senior lien take reasonable steps to obtain a fair market value or the best price that may be obtained in the circumstances when exercising any power of sale on their own (i.e. it is not possible for the entity holding the senior lien to sell the property on its own at a discounted value in detriment of the junior lien”<sup>236</sup>. Whether these criteria can be satisfied under English law is unclear. Second (and subsequent) mortgages are legally enforceable provided that they are registered, and are therefore an effective risk mitigant to the extent that there is surplus equity after discharging any senior mortgage. However, the equitable doctrine of tacking, and the absence of any duty of care owed by senior lenders when exercising their power of sale to junior lenders<sup>237</sup> may prove problematic. A further potential difficulty (although without much practical relevance), is the remedy of foreclosure where the estate of the mortgagor and any subsequent mortgagees is extinguished, although a

junior mortgagee may seek to preserve its security interest through legal process by obtaining relief from forfeiture if it would thereby recover some or all of its loan;

- (d) **ability of the mortgagee to repay.** This requires that banks have underwriting policies with respect to the granting of loans that include assessment of the ability of the borrower's ability to repay<sup>238</sup>. National supervisors may provide guidance<sup>239</sup>;
- (e) **prudent valuation.** Specified valuation criteria (described below) must be met. Additionally, the value of the property must not depend materially on the performance of the borrower, which is hardly likely to be the case in respect of retail or normal corporate borrowing owing to the ability to sell the property; and
- (f) **required documentation.** All the information required at loan origination and for monitoring purposes must be properly documented, including on the ability of the borrower to repay<sup>240</sup>.

4.13.8 The requirements in respect of the ability of the borrower to repay and documentation seem quite limited. This seems to us surprising given that a failure to take account of the former, and the absence of proper documentation on the borrower's ability to repay, were major problems in the origination of sub-prime mortgages in the United States before 2007.

#### *Some definitions*

- 4.13.9 The "regulatory residential real estate" portfolio comprises exposures "secured by property that has the nature of a dwelling and satisfies all applicable laws and regulations enabling the property to be occupied for housing purposes (ie residential property)"<sup>241</sup>. This definition seems to include buy-to-let properties as well as owner-occupied properties as in both cases the property will be used as a residential home.
- 4.13.10 The "regulatory commercial real estate" portfolio comprises exposures "that [are] not a regulatory residential real estate exposure"<sup>242</sup>. It therefore covers any real estate exposures falling within the regulatory real estate category that is not a regulatory residential real estate exposure.
- 4.13.11 The next definition that is relevant is that for exposures materially dependent on cash flows generated by the property. This is defined as exposures "when the prospects for servicing the loan materially depend on the cash flows generated by the property securing the loan rather than on the underlying capacity of the borrower to service the debt from other sources"<sup>243</sup>. According to the Committee "[t]he distinguishing characteristics of these exposures compared to other regulatory real estate exposures is that both the servicing of the loan and the prospects for recovery in the event of default depend materially on the cash flows generated by the property" securing the exposure<sup>244</sup>. An example set out in Basel III of where the material dependence test is met is where more than 50% of the income of the borrower used in a bank's assessment of the borrower's ability to repay is derived from cash flows generated by the property<sup>245</sup>. Buy-to-let lending will therefore be subjected to higher risk weights where a bank considers that more than 50% of the

repayments will be dependent on rental income. For possible exceptions to this treatment see the next paragraph.

- 4.13.12 Exception to the definition of material dependence set out above are made in the following cases that are treated as not being materially dependent on cash flows generated by the property:
- (a) exposures secured on a property that is the borrower's primary residence;
  - (b) exposures secured by income-producing residential housing units to an individual who has mortgaged less than a specified number of properties or units specified by national supervisors;
  - (c) exposures secured by residential real estate to associations or co-operatives regulated under national law with the purpose of granting members the use of a primary residence; and
  - (d) exposures secured by residential real estate to public housing companies and associations that are not run to make a profit regulated under national law and which exist to serve social purposes<sup>246</sup>.

*Risk weights for the regulatory real estate portfolio*

- 4.13.13 The risk weights set out in this section are intended by the Basel Committee to be appropriate for jurisdictions where structural factors result in sustainably low credit losses. National supervisors must determine whether these risk weights are too low in their jurisdiction, and may increase them where appropriate based on an assessment of the risk of such lending<sup>247</sup>.
- 4.13.14 The risk weights are calculated based on the loan-to-value (LTV). This is the amount of the loan divided by the value of the property<sup>248</sup>. While the amount of the loan will be amortised over the repayment term (except for interest only mortgages), the value of the property is generally fixed at the time of origination, preventing the LTV being reduced by increases in property values. This requirement is clearly inspired by lending practices prior to the financial crisis where some lenders assumed that very poor credit quality lending, or undocumented loans, would not lead to losses as property prices would continue to increase for the duration of the loan or earlier refinancing.
- 4.13.15 Three exceptions exist where the value of the property may be adjusted<sup>249</sup>:
- (a) where national supervisors require the value of the property to be revised downward. In this case, the value may be adjusted upwards subsequently to an amount not more than the value at origination;
  - (b) an extraordinary and idiosyncratic event occurs resulting in a permanent reduction in the property's value. This could include cases such as the destruction of the unit or the creation of new transportation infrastructure (e.g. a motorway or high-speed rail line) near the property that materially reduces its value; and

- (c) modifications made to the property that unequivocally increase its value. An example might be an extension to a residential dwelling, or possibly planning permission to change the use of the property that results in a permanent increase in value.

- 4.13.16 A prescribed treatment applies to calculate the LTV for second and subsequent mortgages where there is a higher ranking mortgage held by a different lender<sup>250</sup>.
- 4.13.17 The value of the property must be appraised independently using prudent valuation criteria. National supervisors are tasked with issuing guidance on valuation<sup>251</sup>.
- 4.13.18 The eligibility of credit risk mitigation techniques (other than the mortgage) to reduce the risk weight for secured loans such as mortgage insurance or third party-provided guarantees or credit default swaps is described in the chapter on credit risk mitigation. However, such techniques, even if recognised, may not be used to reduce the LTV of the loan when calculating risk weights under Basel III<sup>252</sup>.

*Risk weights for regulatory residential real estate exposures not materially dependent on cash flows from the property*

- 4.13.19 There are two options at national supervisory discretion: a “whole loan” approach and a “loan splitting” approach. The former takes the LTV of the entire loan. The latter approach involves notionally splitting the loan into different buckets with different risk weights for both segments. Supervisors will decide the approach taken in their jurisdiction<sup>253</sup>.

Whole loan approach risk weights						
LTV	≤ 50%	50% < but ≤ 60%	60% < but ≤ 80%	80% < but ≤ 90%	90% < but ≤ 100%	> 100%
Risk weight	20%	25%	30%	40%	50%	70%

- 4.13.20 Under the loan-splitting approach the risk weight is calculated as follows. First, the amount of the loan equal to 55% of the value of the property is allocated a 20% risk weight. The portion of the loan (if any) above 55% of the value of the property is risk-weighted at 75% for individuals, 85% for SME borrowers and treated as unsecured for all other (e.g. corporate) borrowers and risk-weighted accordingly<sup>254</sup>. Where there is a senior mortgage then the calculations must be adjusted to take account of any higher ranking mortgages<sup>255</sup>, as must any *pari passu* ranking mortgages<sup>256</sup>.

*Risk weights for regulatory residential real estate exposures that are materially dependent on cash flows generated by the property*

- 4.13.21 The risk weights for these exposures are set out in the table below<sup>257</sup>.

Risk weights for regulatory residential real estate exposures that are materially dependent on cash flows						
LTV	≤ 50%	50% < but ≤ 60%	60% < but ≤ 80%	80% < but ≤ 90%	90% < but ≤ 100%	> 100%
Risk weight	30%	35%	45%	60%	75%	105%

4.13.22 For these exposures no loan splitting approach is permitted.

*Risk weights for regulatory commercial real estate exposures that are not materially dependent on cash flows generated by the property*

4.13.23 As with residential property, both a “whole loan” and a “loan splitting” approach are recognised, although the choice will be made by the national supervisor.

4.13.24 For the “whole loan” approach the risk weights are as follows<sup>258</sup>.

Whole loan risk weights for regulatory commercial real estate exposures not materially dependent on cash flows generated by the property		
LTV	≤ 60%	> 60%
Risk weight	Minimum of 60% or risk weight of counterparty if loan were not secured	Risk weight of counterparty

4.13.25 Under the loan splitting approach the portion of the loan exposure up to 55% of the value of the property receives the lower of 60% or the risk weight of the counterparty if the loan were treated as being unsecured. The residual exposure (if any) receives the risk weight of an unsecured loan<sup>259</sup>. Similar adjustments to those for residential loans are made to reflect any more senior mortgages<sup>260</sup>.

*Risk weights for regulatory commercial real estate exposures that are materially dependent on cash flows generated by the property*

4.13.26 Only a whole loan approach is available. The table below sets out the risk weights<sup>261</sup>.

Risk weights for regulatory commercial real estate exposures that are materially dependent on cash flows generated by the property			
LTV	≤ 60%	60% < but ≤ 80%	> 80%
Risk weight	70%	90%	110%

4.13.27 National supervisors may permit banks to apply the risk weights for regulatory commercial real estate exposures that are not materially dependent on cash flows generated by the property if the following two conditions are met:

- (a) overall losses stemming from commercial real estate lending up to 60% of the LTV do not exceed 0.3%; and



- (b) overall losses stemming from commercial real estate lending do not exceed 0.5% of the outstanding loans in any given year<sup>262</sup>.

4.13.28 The remaining treatments for real estate lending are more straightforward.

#### *ADC exposures*

4.13.29 This class of lending secured by real estate is defined as “loans to companies or SPVs financing any of the land acquisition for development and construction purposes, or development and construction of any residential or commercial property”<sup>263</sup>. Lending for the acquisition of forests and agricultural land where there is no planning consent for development, and no intention to apply for such permission, is not treated as an ADC exposure<sup>264</sup>. The ADC risk category is therefore intended to cover lending to finance large-scale property development, whether residential or commercial.

4.13.30 The base risk weight for ADC exposures is 150% reflecting their higher credit risk<sup>265</sup>. However, a preferential risk weight of 100% may be applied if the following criteria are met:

- (a) the lender applies prudent underwriting standards; and
- (b) pre-sale or pre-lease contracts amount to a significant portion of total contracts or substantial equity at risk<sup>266</sup>. The levels will be the subject of national guidance<sup>267</sup>.

#### *Other real estate*

4.13.31 This is a residual category comprised of secured lending that does not fall within either the regulatory real estate or the ADC categories<sup>268</sup>.

4.13.32 The risk weights depend on whether the exposure is materially dependent on the cash flows generated by the property.

4.13.33 If this is *not* the case the following risk weights apply:

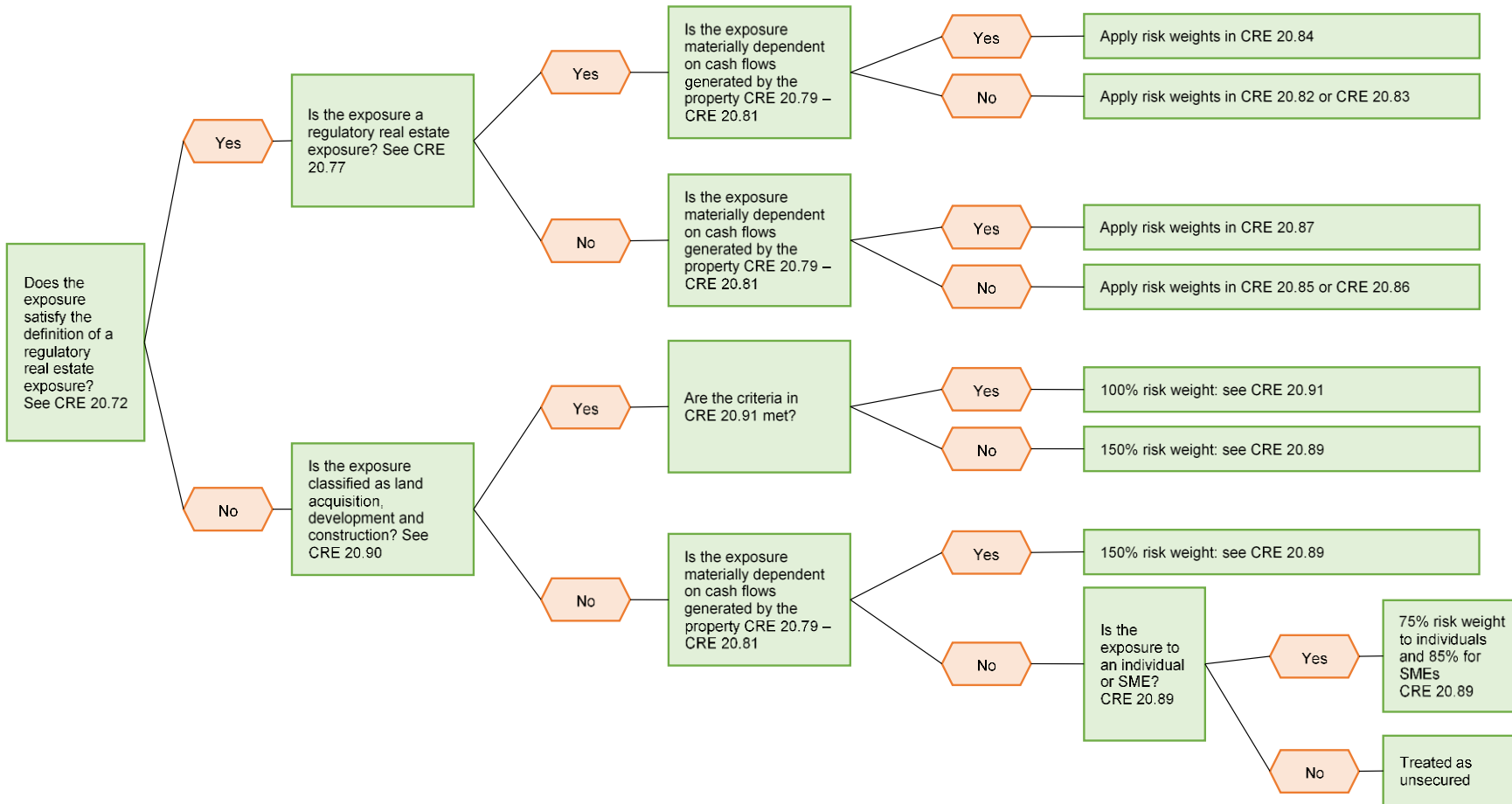
- (a) exposures to individuals are risk weighted at 75%;
- (b) exposures to SMEs are risk weighted at 85%; and
- (c) exposures to other counterparties (including corporates) are treated as being unsecured<sup>269</sup>.

4.13.34 Real estate exposures within this class that *are* materially dependent on the cash flows generated by the property receive a cross-the-board 150% risk weight<sup>270</sup>.

## 4.14 Summary

4.14.1 Given the complexity of this section we summarise the correct treatment of all real estate exposures in the diagram below with references to the relevant rules.

Treatment of Real Estate Exposures



#### 4.15 Risk Weight Multiplier for Exposures with a Currency Mismatch

4.15.1 This paragraph applies to certain unhedged retail lending and residential real estate loans made to individuals where there is a currency mismatch between the lending currency and the currency of the borrower's source of income. A multiplication factor of 1.5 applies to the risk weight, with the result that, for example, a 100% risk weight becomes 150%. A cap of 150% applies, so where the relevant risk weight is above 100% the adjusted risk weight is 150%. The classes of loans covered are: retail exposures and regulatory residential real estate exposures<sup>271</sup>. The types of hedges recognised are natural hedges and financial hedges. In either case, the hedge must cover at least 90% of the loan instalment<sup>272</sup>. The reason for the multiplier would seem inspired by the experience of foreign currency loans during the Eurozone crisis.

#### 4.16 Exposures Giving Rise to Counterparty Credit Risk

4.16.1 Exposures giving rise to counterparty credit risk arising from over-the-counter derivatives, long-settlement transactions and securities financing transactions are subject to the treatment set out in the chapter on counterparty credit risk and not to the rules described in this chapter<sup>273</sup>. The sale of credit derivative is described immediately below.

#### 4.17 Credit Derivatives

4.17.1 Where a bank sells credit protection on a first-to-default or second-to-default credit derivative the following treatment applies. For first-to-default credit derivatives, the risk weight of the assets included in the basket is aggregated up to a maximum of 1250% and multiplied by the nominal amount of the protection provided by the credit derivative to obtain the risk-weighted amount. The treatment for second-to-default credit derivatives is similar, but the asset with the lowest risk-weighted amount is disregarded. The same procedure is followed for nth-to-default credit derivatives with n-1 assets being excluded<sup>274</sup>.

#### 4.18 Defaulted Exposures

4.18.1 Under the standardised approach to credit risk an exposure is regarded as defaulted if it is past due for more than 90 days, or is an exposure to a defaulted borrower. A defaulted borrower is one in respect of which any of the following has occurred:

- (a) any material credit obligation is past due for more than 90 days. An overdraft is treated as defaulted if the customer has breached an advised limit, or been advised of a lower limit than current outstandings;
- (b) any material credit obligation is on non-accrued status;
- (c) a write-off or account-specific provision is made as a result of a significant perceived decline in credit quality;
- (d) any credit obligation is sold at a material credit-related economic loss;

- (e) a distressed restructuring takes place (i.e. a restructuring that may result in a diminished financial obligation caused by the material forgiveness, or postponement, of principal, interest or fees);
  - (f) the borrower is made bankrupt or a similar order has been filed<sup>275</sup>;
  - (g) the borrower has sought or been placed in bankruptcy or similar protection where this would avoid or delay repayment; or
  - (h) any other situation occurs where the bank considers that the borrower is unlikely to pay its credit obligations in full without recourse to actions such as realising security<sup>276</sup>.
- 4.18.2 The definition of default for retail exposures may be applied at the level of each facility, rather than at the level of the borrower<sup>277</sup>. This reflects the fact that defaults on some facilities (such as credit cards) are much more common than on others (e.g. mortgage loans).
- 4.18.3 The risk weights for defaulted exposures are set out below:
- (a) defaulted residential real estate exposures not materially dependent on cash flows generated by the property are risk weighted at 100% net of any specific provisions or write-offs<sup>278</sup>;
  - (b) other exposures where specific provisions are less than 20% of the outstanding amount of the loan attract a 150% risk weight; and
  - (c) other exposures where specific provisions are 20% or more of the outstanding amount of the loan attract a 100% risk weight<sup>279</sup>. At national discretion, this may be reduced to 50% where specific provisions are 50% or more than the outstanding amount of the loan<sup>280</sup>.
- 4.18.4 The different risk weights based on specific provisions reflect the fact that provisioning will reduce the aggregate loss as provisions are deducted from capital through the profit and loss account.

#### 4.19 Other Assets

- 4.19.1 Other assets that are deducted from capital (including assets above the “threshold” deduction treatment) are not risk weighted as the effect on capital has already been recognised. A 250% risk weight applies to assets within the thresholds of the threshold deduction regime<sup>281</sup>.
- 4.19.2 Any other assets held on a bank’s balance sheet for which a specific capital treatment has not been designated are risk-weighted at 100%, with the following exceptions:
- (a) cash<sup>282</sup> held at the bank or in transit is risk-weighted at 0%;
  - (b) gold bullion held at the bank or in another bank on an allocated basis<sup>283</sup>, to the extent that such assets are backed<sup>284</sup> by equivalent liabilities<sup>285</sup>; and

(c) cash items in the process of collection are ascribed a 20% risk weight<sup>286</sup>.

4.19.3 A right-of-use asset under a lease accounted for as such under applicable accounting standards is risk-weighted at 100% provided the asset being leased is tangible (e.g. a computer)<sup>287</sup>.

#### 4.20 Off-balance Sheet Items

4.20.1 Basel III retains the basic framework of Basel I under which off-balance sheet liabilities are converted into notional on-balance sheet exposures through multiplying the gross exposure by a credit conversion factor, although with more detail than under Basel II. The result is that the nominal off-balance sheet exposure is multiplied first by the credit conversion factor set out in this section and then in turn multiplied by the risk weight applicable to the counterparty. Unless the credit conversion factor is 100% the result will be a percentage of the risk weight for the counterparty in question. The purpose of the credit conversion factor is to measure, in a simplified fashion, the probability of the off-balance sheet exposure becoming an on-balance sheet exposure before the counterparty defaults.

4.20.2 Commitments are measured as the committed but undrawn exposure amount (drawn commitments result in an on-balance sheet loan)<sup>288</sup>. National supervisors may exempt certain arrangements for corporates and SMEs where those counterparties are closely monitored on an ongoing basis and the arrangement confers on the bank full discretion whether or not to advance a particular borrowing<sup>289</sup>. Basel III removes the 0% credit conversion factor (i.e. a 0% risk weight) available for commitments under Basel II for commitments that are unconditionally cancellable at any time by the bank, or are automatically cancelled in the event of a deterioration in the counterparty's creditworthiness<sup>290</sup>.

4.20.3 The remaining credit conversion factors are listed from 10% to 100%.

4.20.4 A 100% credit conversion factor applies to the following:

- (a) direct credit substitutes. This includes general guarantees of indebtedness, standby letters of credit serving as financial guarantees for loans and securities, and acceptances (including endorsements);
- (b) sale and repurchase agreements, and asset sales with recourse;
- (c) lending of securities or posting of collateral under repo-style transactions, including securities loans;
- (d) forward asset purchases, forward deposits and partly paid securities; and
- (e) off-balance sheet items that are credit substitutes not explicitly included in any of the preceding categories<sup>291</sup>.

4.20.5 All of the above expose the bank to the full risk of the exposure and are therefore treated in the same way as a direct loan.

4.20.6 A 50% credit conversion factor applies to the following:

- (a) note issuance facilities and revolving underwriting facilities, regardless of the maturity of the underlying facility; and
  - (b) certain transaction-contingent items (e.g. performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions)<sup>292</sup>.
- 4.20.7 A 40% credit conversion factor applies to commitments, regardless of the maturity of the underlying facility, unless a lower percentage is applicable under the following paragraphs<sup>293</sup>.
- 4.20.8 A 20% credit conversion factor applies to issuing and confirming banks of short-term self-liquidating trade letters of credit arising from the movement of goods with a maturity of below one year (such as documentary credits collateralised by the underlying shipment)<sup>294</sup>.
- 4.20.9 A 10% credit conversion factor applies to commitments that are unconditionally cancellable at any time by the bank without prior notice, or that effectively provide for an automatic cancellation due to a deterioration in a borrower's creditworthiness. Where the national supervisor considers the bank's ability to cancel to be constrained it may require a higher credit conversion factor to be applied<sup>295</sup>. Under Basel II, this was 0%.
- 4.20.10 Undertakings to provide a commitment on an off-balance sheet item are subject to the lower of the two relevant credit conversion factors<sup>296</sup>. Thus, a commitment to open a short-term trade letter of credit attracts a 20% credit conversion factor and not 40%. Equally, an unconditionally cancellable commitment to issue a direct credit substitute are subject to a 10% credit conversion factor and not 100%<sup>297</sup>.

#### 4.21 External Credit Assessment Institutions (Rating Agencies)

- 4.21.1 As has been mentioned, national supervisors may recognise or not the use of external credit ratings to calculate capital requirements. The following section is only relevant in those jurisdictions that permit this. Basel III provides that national supervisors are to determine those external credit assessment institutions (ECAIs) that are eligible to produce credit ratings that may be used by banks<sup>298</sup>. Basel III also sets out certain criteria, derived from Basel II, that must be met by ECAIs before they will be recognised. The eligibility criteria are as follows:
- (a) **objectivity.** The methodology for assigning ratings must be rigorous, systematic and subject to some form of validation based on historical experience;
  - (b) **independence.** The ECAI must be independent and should not be subject to political or economic pressures that may influence the rating;
  - (c) **international access/transparency.** The individual ratings, the key elements underlying the ratings assessment, and whether the issuer participated in the rating process must be publicly available;

- (d) **disclosure.** An ECAI should disclose its code of conduct, compensation arrangements, conflicts of interest, ratings' assessment methodology, default rates, etc.;
  - (e) **resources.** An ECAI should have sufficient resources to carry out high-quality ratings;
  - (f) **credibility.** Reliance on ratings by independent parties (investors, insurers, etc.) is evidence of credibility;
  - (g) **no abuse of unsolicited ratings.** ECAs may not abuse unsolicited ratings to put pressure on unrated entities to obtain solicited ratings; and
  - (h) **co-operation with the supervisor.** ECAs should notify supervisors of significant changes to methodologies and provide access to external ratings and other relevant data<sup>299</sup>.
- 4.21.2 The Committee has published further details on disclosure and compensation arrangements<sup>300</sup>. Basel III does not require regulation of rating agencies, unlike the EU.
- 4.21.3 National supervisors are responsible for mapping the ratings used by ECAs recognised by them to ensure consistency with the risk buckets set out in the text (which are based on Standard & Poor's ratings)<sup>301</sup>. When conducting this process supervisors should assess the size and scope of the pools of issuers covered, the range and meaning of the ratings and the definition of default<sup>302</sup>. Guidance has been published in the *Standardised Approach - Implementing the Mapping Process (2019)*<sup>303</sup>.
- 4.21.4 While supervisors will decide which ECAs may be used in their jurisdiction, banks may select which of the recognised ECAs they elect to use subject to the following criteria. Banks must use the chosen ECAs and their ratings consistently for all types of exposure, for both risk weighting and risk management purposes. Banks are not allowed to "cherry pick" the assessments provided by different ECAs or to arbitrarily change the use of ECAs<sup>304</sup>.

#### *Multiple assessments*

- 4.21.5 If there is a single rating for a particular exposure then that assessment must be used<sup>305</sup>. If there are two assessments, then the assessment that gives rise to the higher risk weight is applied<sup>306</sup>. Where there are three or more ratings, then the two assessments corresponding to the lowest risk weight will be used. If they give rise to the same risk weight, then that risk weight will apply. If they differ, then the rating giving rise to the higher risk weight of the two is used<sup>307</sup>.

#### *Issuer-specific and issue-specific ratings*

- 4.21.6 Where an issue-specific rating exists it must be used. If it does not then the following principles apply:

- (a) if there is issue-specific rating for an issued debt instrument, and the bank's unrated exposure is either senior or *pari passu* with the rated issue then the bank may use the rating. Otherwise, the exposure is treated as unrated;
- (b) if there is an issuer rating that applies to senior unsecured exposures, the bank can use this rating only if its exposure falls within that class. Other unrated exposures are treated as unrated;
- (c) if there is a low-quality issue or issuer rating (i.e. one attracting a higher risk weight than that applicable to unrated exposures), and the bank's unrated exposure ranks *pari passu* or junior to that exposure, it must be assigned the same rating;
- (d) if there is an issue rating that is high quality (i.e. attracts a lower risk weight), then a bank may only use the high quality rating if exposures fall within the relevant class<sup>308</sup>.

#### Short term assessments

4.21.7 Detailed rules govern the use of short term ratings (exposures of less than three months). Such ratings may not be used to assess other short-term exposures. Nor can a short-term rating be used to support a risk weight for unrated long-term exposures. Short-term ratings may only be used for short-term exposures against banks and corporates. The table below "provides a framework" for banks' exposure to specific short-term facilities such as commercial paper<sup>309</sup>.

Risk weight for specific short-term ratings (S&P, Moody's)				
External rating	A-1/P-1	A-2/P-2	A-3/P-3	Others
Risk weight	20%	50%	100%	150%

4.21.8 If a short-term rated facility attracts a risk weight of 50%, an unrated short-term exposure cannot be risk-weighted at less than 100%. If the rating of a short-term facility is rated 150% all short-term and long-term unrated exposures are risk-weighted at 150%, although this may be reduced by eligible credit risk mitigation<sup>310</sup>.

#### Corporate groups

4.21.9 An external rating for one entity within a corporate group cannot be used to risk-weight exposures to other group companies<sup>311</sup>.

#### Unsolicited ratings

4.21.10 As a general rule, banks should use solicited ratings. However, national authorities may allow banks to use unsolicited ratings, if they are satisfied that unsolicited ratings are not inferior in quality to solicited ratings<sup>312</sup>.



## 4.22 Transitional Arrangements for Equity Exposures

- 4.22.1 The Basel III text include a time-limited transitional provision for equity exposures under the standardised approach.
- 4.22.2 Speculative unlisted equity exposures are risk-weighted at 100% in 2023 increasing by 60 percentage points per year until 2027 (i.e. over a 5 year period).
- 4.22.3 All other equity exposures are risk-weighted at 100% increasing by 30 percentage points per year until 2027<sup>313</sup>.

## 5. INTERNAL RATINGS-BASED APPROACH TO CREDIT RISK (IRB)

### 5.1 Introduction

- 5.1.1 Allowing banks to use internal ratings to determine their capital requirements was the core of the Basel II capital accord. As will be seen, the financial crisis persuaded the Basel Committee to restrict the availability of this approach, which is detailed in this chapter.
- 5.1.2 There are generally two IRB approaches: a foundation IRB approach and an advanced IRB approach. Originally, the advanced IRB approach was expected to be applied only by a limited number of internationally-active banks, although that is not what happened. The reason for the restriction on the use of the advanced IRB approach under Basel III is the fact that many models performed poorly during the 2007-2009 financial crisis, and there was significant incommensurability of capital ratios between different banking groups, as such groups legitimately applied different risk weights to otherwise identical exposures based on their own data and loss experience.

#### *Outline of IRB*

- 5.1.3 Both the foundation and the advanced IRB approaches are based on six key principles:
- (a) the classification of each exposure by broad exposure type e.g. sovereign, corporate, retail, etc.;
  - (b) the identification , within certain exposure classes, of more granular “asset classes”;
  - (c) for each exposure type, the bank determines either one or all risk components using its own internal measurements;
  - (d) the bank then calculates a continuous risk weight function (which may vary depending on the type of exposure) and which provides risk weights (and therefore capital charges) for given sets of these components;
  - (e) the bank must comply with specified minimum requirements; and
  - (f) the bank must obtain the prior consent of its supervisor to apply either the foundation or the advanced IRB approach.
- 5.1.4 These elements will now be described in more detail. In this chapter it is assumed that the loan or exposure is not collateralised, and that the bank has not entered into a netting agreement, and does not benefit from a qualifying guarantee or credit derivative. The treatment of collateral, on-balance sheet netting, guarantees and credit derivatives is described in the next chapter on Credit Risk Mitigation.

- 5.1.5 The IRB approach distinguishes between exposures in five different portfolios, and a separate approach applies to each portfolio (although, as mentioned, individual portfolios may need to be broken down into asset classes). The portfolios are: (a) corporate exposures, (b) sovereign exposures, (c) inter-bank exposures, (d) retail exposures, and (e) equity exposures<sup>314</sup>. Equity exposures are, however, ineligible for any IRB treatment and must instead be risk-weighted under the standardised approach<sup>315</sup>. The corporate portfolio also includes five sub-classes of specialised lending: project finance (PF), object finance (OF), commodities finance (CF), income-producing real estate (IPRE) and high-volatility commercial real estate (HVCRE)<sup>316</sup>.
- 5.1.6 The capital charge for an exposure within an IRB portfolio depends on a set of risk components<sup>317</sup>. These components are intended to reflect the drivers of credit risk, and cover features that are borrower specific as well as transaction specific. By taking account of the characteristics of both the borrower and the transaction, the capital charge under the IRB approach is intended to be more closely related to the actual risk incurred by the bank, as well as banks' economic capital models.
- 5.1.7 Additionally, Basel III sets out risk-weight functions which are the means by which risk components are transformed into risk-weighted assets, and therefore capital requirements<sup>318</sup>.
- 5.1.8 A bank must meet minimum standards in order to be able to use its own calculations for each risk component<sup>319</sup>.
- 5.1.9 For some portfolios Basel III provides both a foundation and an advanced IRB approach. The difference between the two is that under the foundation IRB approach banks provide only one of the risk components (the probability of default or PD) using their internal measurements. The other risk components are calculated using supervisory estimates set out in Basel III. Under the advanced IRB approach, banks that meet additional requirements are permitted to apply their own internal estimates for the other risk components (loss given default or LGD, exposure at default or EAD, and Maturity or M)<sup>320</sup>.
- 5.1.10 The advanced IRB approach is *not* available for the following types of exposures (unlike Basel II):
- (a) corporate exposures (other than specialised lending) where the consolidated annual revenues of the group are greater than €500 million<sup>321</sup>, based on the consolidated group accounts calculated over a three year period<sup>322</sup>;
  - (b) exposures to banks and other financial institutions within the bank portfolio, regardless of size<sup>323</sup>; or
  - (c) equity exposures<sup>324</sup>.
- 5.1.11 The Basel Committee has removed these portfolios from the advanced IRB approach as it considers that banks were unable to accurately estimate LGD and EAD for such exposures, based on experience during the financial crisis.

- 5.1.12 The IRB approach is based on measurements of unexpected losses (UL) only<sup>325</sup>. Expected losses are subject to their own treatment<sup>326</sup>.

## 5.2 Roll Out of IRB across a Given Asset Class

- 5.2.1 Basel II required banks adopting an IRB approach, in principle, to roll out that approach across all asset classes. This has been abandoned under Basel III. Instead, the focus is now on individual asset classes and the rules on roll-out are firmly focussed on asset classes with no expectation that a bank will roll out a chosen IRB approach more widely.
- 5.2.2 An “asset class” is defined more granularly than a portfolio<sup>327</sup>. The following asset classes are set out in Basel III:
- (a) sovereign exposures;
  - (b) bank exposures;
  - (c) corporate exposures (excluding specialised lending and purchased receivables);
  - (d) specialised lending;
  - (e) corporate purchased receivables;
  - (f) qualifying regulatory residential exposures;
  - (g) retail residential mortgage exposures;
  - (h) other retail exposures (excluding purchased receivables); and
  - (i) retail purchased receivables<sup>328</sup>.
- 5.2.3 When a bank adopts an IRB approach for a particular asset class (defined above) within a business unit it should, in principle, extend it across all exposures falling within that asset class<sup>329</sup>. However, the Basel Committee recognises that for many banks it may not be practicable to implement an IRB approach across an entire asset class, and that there may be reasons, such as data limitations, that prevent a bank from adopting the advanced IRB approach to all exposures in a particular class, but in different business units<sup>330</sup>. Supervisors may therefore allow banks to adopt a phased roll-out including: (i) adoption of IRB across the asset class within the same business unit, (ii) adoption of IRB for the asset class across business units in the same banking group and (iii) a move from the foundation to the advanced IRB approach for certain risk components where an advanced approach is permitted<sup>331</sup>. When a bank adopts an IRB approach for an asset class within a particular business unit, it must apply that approach to all exposures within the class in that business unit<sup>332</sup>.
- 5.2.4 If a bank intends to adopt an IRB approach for a given asset class, it must produce an implementation plan specifying to what extent it intends to roll out the IRB approach within that asset class and individual business units. This plan should be realistic and must be agreed with the relevant national

supervisor. “Cherry picking” specific exposures within a given asset class is prohibited<sup>333</sup>. Immaterial exposures may be exempted with supervisory approval<sup>334</sup>.

- 5.2.5 A bank that adopts an IRB approach for a given asset class is expected to continue that approach for that asset class. A voluntary return to a less sophisticated approach is permitted only in extraordinary circumstances, such as divestiture of a large part of the bank’s credit-related business, and is subject to prior supervisory approval<sup>335</sup>.
- 5.2.6 Given data limitations in respect of specialised lending, a bank may move to the foundation or advanced IRB approach for a given class of such exposures, without doing so for other classes of specialised lending (e.g. applying an IRB approach for project finance but not for other forms of specialised lending). The exception is high-velocity commercial real estate, where adoption of an IRB approach requires adoption of the same approach to material income-producing real estate exposures<sup>336</sup>.

### 5.3 Risk Components

- 5.3.1 The risk components for the foundation and advanced IRB approaches are as follows<sup>337</sup>:
- (a) *Probability of default* (PD). PD measures the probability that a particular borrower will default. This depends on the characteristics of the borrower. All banks applying an IRB approach are required to determine the probability of default<sup>338</sup>. There is a limited exception in respect of the specialised lending sub-classes where banks that are unable to calculate PD owing to data limitations are able, or may be required, to use supervisory risk weights. All banks must have a meaningful distribution of exposures across borrower grades with no excessive concentrations<sup>339</sup>.
  - (b) *Loss given default* (LGD). LGD measures the extent of the loss that a bank will suffer if a particular borrower defaults (i.e. the “recovery rate”), measured in terms of the economic loss to the lender<sup>340</sup>. Unlike the probability of default, loss given default (LGD) is transaction specific as the size of the loss will depend on the characteristics of the particular exposure e.g. whether it is senior or subordinated, and whether the borrower has provided any collateral, or the bank benefits from other credit protection. Under the foundation IRB approach, Basel III specifies the loss given default. Under the advanced IRB approach, banks are permitted to use their own internal estimates of LGD<sup>341</sup>.
  - (c) *Exposure at Default* (EAD). EAD measures the size of a bank’s exposure on the default of a borrower. For on-balance sheet transactions, the exposure at default is normally the amount of the loan or exposure, although EAD may be reduced if a bank has in place a recognised netting agreement<sup>342</sup>. For off-balance sheet transactions the position is more complex. Banks are required to estimate the extent to which the bank is likely to be exposed if the counterparty defaults. Under the foundation IRB approach Basel III provides standard figures for EAD based on the credit conversion factors used in the standardised approach to convert

off-balance sheet liabilities to notional on-balance sheet amounts<sup>343</sup>. Under the advanced IRB approach banks are permitted to determine EAD themselves either through the committed undrawn amount multiplied by a credit conversion factor, or through direct estimation of total facility EAD<sup>344</sup>, provided that the facility is not subject to a 100% credit conversion factor under the standardised approach<sup>345</sup>. The definition of commitments under the standardised approach applies to the foundation and advanced IRB approaches<sup>346</sup>. Floors apply to own-estimates of EAD<sup>347</sup>.

- (d) *Maturity (M)*. M measures the contractual maturity of a bank's exposure to a borrower. The relevance of maturity is that, other factors being equal, a long term loan is more risky than a short term loan. Maturity is also relevant in respect of collateral, on-balance sheet netting, guarantees and credit derivatives if there is a mismatch between the underlying exposure and the hedge. This is considered further in the chapter on Credit Risk Mitigation.

- 5.3.2 Under the foundation IRB approach, transactions are assumed to have a maturity of two and a half years (except for repo-style transactions)<sup>348</sup>. However, national supervisors may require banks to measure the maturity of each transaction under the foundation IRB approach<sup>349</sup>. Banks using the advanced approach must take account of the maturity of individual exposures, although this may be fixed (at supervisory discretion) at two and a half years (the foundation IRB treatment) for facilities to smaller corporate borrowers<sup>350</sup>, reflecting their lower volatility of loss rates. Such fixing must apply to all banks using A-IRB in that jurisdiction, and cannot be applied on a bank-by-bank basis<sup>351</sup>.
- 5.3.3 The maximum maturity under IRB is five years<sup>352</sup>. There is a floor of one year<sup>353</sup>, although this does not apply to certain short-term exposures which are fully collateralised and are capital market driven (i.e. OTC derivatives, margin lending, repo-style transactions with an original maturity of less than one year)<sup>354</sup>. Nor does it apply to the following: (i) short-term self-liquidating trade transactions; (ii) issued and confirmed short-term letters of credit<sup>355</sup>; or (iii) other short-term exposures defined by national supervisors<sup>356</sup>. Instruments subject to a determined cash flow schedule have their maturity assessed using the exposures' effective maturity (a formula applies)<sup>357</sup>, unless this cannot be calculated, in which case a more conservative measure must be used, usually the contractual maturity<sup>358</sup>.

## 5.4 Minimum Requirements

- 5.4.1 Banks that use either the foundation or the advanced IRB approach must meet certain minimum requirements at the outset and on an ongoing basis<sup>359</sup>. These cover: (a) the composition of minimum requirements, (b) compliance with minimum requirements, (c) internal rating system design, (d) risk rating system operations, (e) corporate governance, (f) use of internal ratings, (g) validation of internal estimates, and (h) disclosure<sup>360</sup>. The overriding objective is that rating and risk estimation systems and processes provide for a meaningful assessment of borrower and transaction characteristics, a meaningful differentiation of risk, and reasonably accurate and consistent quantitative estimates of risk<sup>361</sup>.

- 5.4.2 The requirements are complex and may vary between the foundation and the advanced IRB approach. However, all banks applying an IRB approach must satisfy the following requirements:
- (a) The bank's rating system must have two separate dimensions covering (i) the risk of borrower default and (ii) transaction-specific factors<sup>362</sup>. Separate exposures to the same borrower must generally be allocated to the same borrower grade which measures the risk of the borrower defaulting<sup>363</sup>. The second dimension reflects transaction-specific factors such as collateral, seniority and product type<sup>364</sup>. An exception is for specialised lending, where banks may use a single rating system that measures expected loss or EL<sup>365</sup>.
  - (b) Internal estimates of PD and, where applicable, LGD and EAD, have to incorporate all relevant, material and available data. Both internal data and external (e.g. bought) data may be used<sup>366</sup>. Estimates must be grounded in historical experience and empirical evidence. Estimates based on purely subjective considerations are not accepted<sup>367</sup>.
  - (c) Banks may use multiple rating methodologies or systems e.g. middle market and large corporate, although where multiple systems are used the rationale for assigning a borrower to one system must be documented and not be driven by the desire to minimise regulatory capital requirements<sup>368</sup>.
  - (d) Internal ratings, and default and loss estimates, must play an essential role in the credit approval, risk management, internal capital allocation and corporate governance of IRB banks. Ratings that are developed solely for the purpose of determining regulatory capital requirements are not recognised<sup>369</sup>. Generally, banks must have been using an internal rating system broadly in line with the requirements of Basel III for three years prior to qualification<sup>370</sup> (although longer data sets of up to seven years apply for calculating LGD and EAD<sup>371</sup>).
  - (e) Banks must have independent credit risk control units that are responsible for the design or selection, implementation and performance of their rating systems<sup>372</sup>. Ratings assessments and reviews must be completed by a party not standing to benefit from the decision to extend credit<sup>373</sup>. Ratings must generally be reviewed at least on an annual basis<sup>374</sup>.
  - (f) All material aspects of the rating and estimation processes must be approved by the bank's board of directors (or a designated committee of directors), and by senior management. Directors and senior management must also have a general understanding of the bank's rating system and detailed comprehensive understanding of management reports<sup>375</sup>. Senior management must also have a good understanding of the design and operation of the system, and management must ensure that it operates properly<sup>376</sup>.
  - (g) The bank's rating system must be reviewed annually by the bank's internal audit function<sup>377</sup>.

- 5.4.3 The IRB approaches to corporate (other than specialised lending), sovereign, bank and investment firm portfolios are very similar. The approach for retail exposures differs owing to the different characteristics of retail lending.

## 5.5 No IRB Treatment

- 5.5.1 If no IRB treatment is specified for an asset class, the risk weight is 100% (except where a 0% risk weight applies under the standardised approach) and the resulting risk weighted assets are assumed to cover unexpected losses only<sup>378</sup>. Equity exposures must be risk-weighted using the standardised approach as no IRB approach may be used for equity exposures<sup>379</sup>.

## 5.6 Foundation IRB for Corporate Exposures

- 5.6.1 Corporate exposures are defined, in general, as the debt obligation of a corporation, partnership or proprietorship<sup>380</sup>. Banks are permitted to separate out exposures to small and medium-sized (SME) borrowers which attract a lower risk weight (and, hence, capital charge)<sup>381</sup>. The preferential treatment for SME lending applies where the reported sales for the borrower's consolidated group are less than €50 million<sup>382</sup> (or, at national discretion, where total assets are below €50 million, if total sales are not a meaningful indicator of firm size<sup>383</sup>).
- 5.6.2 Under the foundation IRB approach, banks are required to specify a number of grades for performing and non-performing loans. These grades should cover the spectrum from loans that are virtually risk-free to those that are in default. At a minimum, a bank is required to have seven grades for performing loans and one grade for non-performing loans<sup>384</sup>. A "grade" means an assessment of borrower risk on the basis of a specified and distinct set of rating criteria, and the intention is that each grade provides for a basically homogenous pool of exposures<sup>385</sup>. External ratings may be the primary factor in determining an internal rating, but banks must consider other available information<sup>386</sup>.
- 5.6.3 The bank then allocates each loan to a single grade. The bank determines for each grade the long-run average probability of default (PD) of all loans within that grade or pool over a one year time horizon<sup>387</sup>. Although the time period for calculating PD is one year, banks are expected to use a longer time frame when allocating specific borrowers to individual grades<sup>388</sup>. This is to counter the effect of the economic cycle on the calculation of capital charges, which would otherwise increase significantly as borrowers' creditworthiness deteriorated in an economic downturn<sup>389</sup>. The result is to give a single average PD figure for each borrower grade. For very high quality grades Basel III imposes a PD floor of 0.05% (up from 0.03% under Basel II)<sup>390</sup>. For defaulted assets the PD is 100%<sup>391</sup>. Three methods are permitted for the calculation of PD estimates: (i) data on internal default experience, (ii) mapping internal grades to the scale used by a ratings agency, and (iii) a simple average of default-probability estimates for borrowers assigned to a given grade<sup>392</sup>.
- 5.6.4 The next step involves the bank estimating the likely loss given default (LGD) for each exposure within each borrower grade. Under the foundation IRB approach, LGD is itself specified by Basel III and is 40% for senior claims (a reduction from Basel II)<sup>393</sup> and 75% for subordinated claims<sup>394</sup>. This reflects an



assumption that on average a bank will recover 60% in respect of senior claims and 25% for subordinated claims. A facility is treated as subordinated if it is expressly subordinated to another facility, although national supervisors may use a wider definition of subordination, including economic subordination<sup>395</sup>.

- 5.6.5 There is no express maturity adjustment under the foundation IRB approach. However, as mentioned above, national supervisors may require the effect of maturity to be taken into account under the foundation IRB approach.
- 5.6.6 The risk weight for on-balance sheet assets is calculated as a continuous function of the probability of default (PD) and the loss given default (LGD). The formula for determining the continuous risk weight function is set out in Basel III and produces a function that sets out, for each level of PD and LGD, a given risk weight<sup>396</sup>. As mentioned above, a downward adjustment is made in the case of exposures to SME borrowers. The amount of the adjustment depends on the total annual sales of the individual SME borrower<sup>397</sup>.

## 5.7 Risk weighted assets

- 5.7.1 As with the standardised approach, the capital charge under IRB is based on risk weighted assets. A risk weighted asset (RWA) is determined by multiplying the risk weight of the exposure (derived from the continuous risk function referred to above) by the bank's exposure at default (EAD).

$$\text{RWA} = \text{counterparty risk weight capital charge} \times 12.5 \times \text{EAD}^{398}$$

- 5.7.2 For loans and on-balance sheet items EAD is simply the nominal amount of the exposure. The overall capital charge is therefore equal to the sum of each risk weighted asset.
- 5.7.3 For off-balance sheet items (other than derivatives) the approach is similar to that for loans. The bank assigns the exposure to a PD grade as described above. In the case of a commitment, this will be the PD grade of the borrower. For a guarantee provided by a bank, the PD grade corresponds to that of the underlying obligor. The bank then calculates the loss given default (LGD) by applying either a 40% figure for senior commitments or a 75% figure for subordinated commitments. The counterparty risk weight is derived in exactly the same way as for on-balance sheet items through the continuous risk weight function referred to above. The counterparty risk weight is then multiplied by a credit conversion factor (CCF) to produce the capital charge. Under the foundation IRB approach, banks are required to apply the same credit conversion factors as under the standardised approach<sup>399</sup>.

## 5.8 Advanced IRB for Corporate Exposures

- 5.8.1 The advanced IRB approach is similar to the foundation IRB approach. The main difference is that banks are required, with the consent of their supervisor, to apply their own estimates in calculating the loss given default and the exposure at default<sup>400</sup>. The requirements in respect of banks' own estimates of LGD and EAD are set out in the Basel III text<sup>401</sup>. Additionally, there is an express maturity (M) dimension so that risk weights are calculated from a continuous function of the probability of default, the loss given default, the exposure at default and the maturity of exposures<sup>402</sup>. As with the foundation

IRB approach, a risk weighted asset is equal to the exposure at default multiplied by the applicable counterparty risk weight. For certain off-balance sheet items banks may apply their own internal models in place of the specified credit conversion factors provided the exposure is not subject to a credit conversion factor of 100% under the foundation IRB approach (in which case the bank must apply a 100% credit conversion factor)<sup>403</sup>. These are undrawn revolving commitments to extend credit, purchase assets or issue credit substitutes. For other off-balance sheet exposures standardised credit conversion factors must be used<sup>404</sup>. The capital charge under advanced IRB is equal to the sum of all risk weighted assets.

- 5.8.2 Banks must have been estimating and employing LGDs and EADs for at least three years prior to qualification in a manner broadly consistent with the Basel III standard<sup>405</sup>. Data sets must meet a longer time period<sup>406</sup>.
- 5.8.3 As mentioned above, the A-IRB approach is not available for exposures to large corporates.

## 5.9 Sovereign Exposures

- 5.9.1 The IRB portfolio for sovereign exposures covers exposures to sovereigns, central banks, public sector entities that are treated as sovereigns, specified international organisations<sup>407</sup>, and those multi-lateral development banks that meet the criteria for a 0% risk weight under the standardised approach<sup>408</sup>.
- 5.9.2 The determination of capital charges, including the calculation of PD, LGD and EAD, for sovereign exposures, follows a similar approach to that for corporate exposures, although under the foundation IRB approach the assumed LGD is 45%<sup>409</sup>. However, due to the credit risk free nature of many sovereigns, there is no floor to the minimum probability of default (PD)<sup>410</sup>, which for the best credit quality sovereigns may be 0%. Exposures to sovereigns with a 0% PD attract no capital charge.
- 5.9.3 Banks are able to apply both a foundation and an advanced IRB approach to the sovereign portfolio.

## 5.10 Exposures to Banks and certain Securities Firms

- 5.10.1 The IRB portfolio for banks applies to exposures to banks, certain securities and other financial firms and multi-lateral development banks that do not meet the requirements for a 0% risk weight under the standardised approach. Additionally, exposures to domestic public sector entities are treated as bank exposures if they are not expressly treated as sovereign exposures<sup>411</sup>. The same applies to covered bond exposures<sup>412</sup>. Securities and financial firms must be subject to prudential standards and a level of supervision equivalent to those applicable to banks (including capital and liquidity requirements)<sup>413</sup>. This has already been discussed in the context of the standardised approach.
- 5.10.2 Additionally, exposures to any of the previously listed entities which take the form of subordinated debt or regulatory capital instruments are also included within the IRB portfolio for banks<sup>414</sup> (e.g. Tier 2 capital issued by a bank). An exception exists for: (i) exposures that are treated as equity exposures under the IRB approach, (ii) exposures which are required to be deducted from

capital, (iii) exposures risk-weighted at 250% under the threshold deductions approach; or (iv) exposures risk-weighted 1250% under the standardised approach as they constitute a “material holding”<sup>415</sup>. The purpose of these qualifications is to ensure that where another, more onerous, treatment is specified elsewhere in the Basel III framework then that treatment applies to the exposure, and not the treatment under the IRB approach to bank exposures.

- 5.10.3 The determination of capital charges for bank exposures follows the same approach as that for corporate exposures (including the minimum 0.05% for PD<sup>416</sup>).
- 5.10.4 Exposures to regulated financial institutions (including insurers - presumably only when they are not subject to the framework for corporate exposures) whose total assets are equal to or more than US\$ 100 billion are subject to a multiplier of 1.25 (i.e. a 25% uplift)<sup>417</sup>. The reason is that failures of major financial firms were more common in the financial crisis than failures amongst diversified corporates. This reflected the greater correlation between defaults amongst such firms and other companies. The same uplift applies to unregulated financial institutions regardless of size<sup>418</sup>.
- 5.10.5 The assumed LGD under the foundation IRB approach is 45%<sup>419</sup>. Subordinated exposures attract an LGD of 75%<sup>420</sup>. The advanced IRB approach has been withdrawn for exposures in this portfolio<sup>421</sup>.

## 5.11 Retail Exposures

- 5.11.1 The IRB approach for retail exposures differs from the three portfolios referred to above because of differences in the risk characteristics of retail lending, and the way in which banks manage such exposures. The essential characteristic of retail lending is that it is a basically homogenous portfolio with a large number of small value loans.
- 5.11.2 There is no foundation approach for retail exposures. Banks are therefore required to calculate internal estimates for all risk components (i.e. PD, LGD and EAD)<sup>422</sup> including the effect of credit risk mitigation techniques in the retail portfolio<sup>423</sup>. Banks applying, or required to apply, the foundation IRB approach to corporate or bank exposures may apply the IRB treatment for retail exposures.
- 5.11.3 For any exposure to fall within the retail portfolio it must meet criteria relating to both the borrower and, in one case, the value of the exposure<sup>424</sup>. The retail portfolio is comprised of the following types of transactions (the definition has changed since Basel II):
  - (a) exposures to individuals not secured on real estate regardless of size (national supervisors may implement a size criterion to distinguish retail from corporate lending). Examples of exposures in this asset class are credit cards, overdrafts, retail facilities secured by financial instruments, personal loans, car loans, student loans and other exposures with similar characteristics<sup>425</sup>;

- (b) exposures to individuals secured by residential mortgages (including second and subsequent mortgages) regardless of size<sup>426</sup>;
  - (c) exposures to associations or co-operatives of individuals established for the sole purpose of enabling members to acquire a primary residence, regardless of size<sup>427</sup>; and
  - (d) SME loans<sup>428</sup> provided: (i) the loan is originated and managed as a retail exposure and (ii) the total amount lent is less than €1 million<sup>429</sup>. SME loans extended through, or guaranteed by, an individual are subject to the same treatment<sup>430</sup>. The first requirement excludes loans managed individually in a way comparable to corporate exposures<sup>431</sup>.
- 5.11.4 Supervisors have the discretion to restrict the eligibility of buy-to-let loans included in the retail portfolio where the individual has mortgaged more than a specified number of properties, in which case such lending must be treated as a corporate exposure<sup>432</sup>. Where a threshold applies on the loan amount (as is the case for SME lending, and may be required at national discretion for other retail loans) the Basel Committee invites supervisors to provide flexibility so that banks are not required to develop extensive new information systems<sup>433</sup>.
- 5.11.5 Banks are required to divide their retail portfolio into three separate asset classes: (a) residential mortgage lending, (b) “qualifying” revolving retail exposures and (c) all other retail exposures<sup>434</sup>.

#### *Residential mortgage sub-portfolio*

- 5.11.6 The residential mortgage portfolio consists of retail mortgage lending (including first and subsequent mortgages, term loans and revolving credits secured on mortgage)<sup>435</sup>.

#### *Qualifying revolving retail exposures*

- 5.11.7 Qualifying revolving retail exposures are defined as loans that meet the following criteria:
- (a) the exposures are revolving, unsecured and uncommitted, both contractually and in practice;
  - (b) the exposures are solely to individuals;
  - (c) the maximum exposure to any individual in the sub-portfolio is €100,000 or less;
  - (d) the portfolio has a low volatility of loss rates relative to average loss rates;
  - (e) data on loss rates are retained to allow analysis of loss rate volatility; and

(f) the national supervisor agrees with the bank that treatment as a qualifying revolving retail exposure is consistent with the underlying risk characteristics of the included loans<sup>436</sup>.

5.11.8 The final requirement is curious as elsewhere where supervisory consent is required under Basel III (such as to use an IRB approach) the intention is that the bank must demonstrate to its supervisor that it meets the relevant quantitative and qualitative requirements. It seems difficult to believe that national supervisors will independently decide whether particular exposures included in this sub-portfolio are eligible as they lack the resources to make such judgments. In practice, we expect banks will be required to show that such loans meet the relevant requirements and, possibly, that application of this treatment is prudent.

5.11.9 Segmentation at country level (or below) should be the general rule<sup>437</sup>.

5.11.10 Further, exposures included within the qualifying revolving retail exposure sub-portfolio are further divided into exposures to “transactors” and “revolvers”. The definition of “transactor” is identical to that used under the standardised approach<sup>438</sup>. In summary, it consists of: (i) credit/charge cards where the balance is repaid in full at each payment date, (ii) overdrafts where there has been no drawing over the past 12 months, and (iii) exposures with less than 12 months of repayment history<sup>439</sup>. Any exposure to a person that is not a transactor is an exposure to a revolver.

#### *Other retail exposures*

5.11.11 The “other retail” sub-portfolio consists of all retail exposures that do not fall within the two previous categories. It is therefore a residuary category.

#### *Capital requirements*

5.11.12 Banks are required to identify, in accordance with their internal model, distinct pools of retail exposures for each asset class. For each pool the bank is required to provide quantitative measures of PD, LGD and EAD in respect of that pool<sup>440</sup>. There is no obligation, therefore, to determine the LGD and EAD for individual exposures within a pool. This reflects the homogenous nature of such lending.

5.11.13 The minimum PD for retail lending is either 0.10% (qualifying revolving retail exposures to “revolvers”) and 0.05% for all other retail exposures (including qualifying revolving retail exposures to “transactors”)<sup>441</sup>. The minimum LGD for residential mortgages is fixed at 5% irrespective of the collateral provided<sup>442</sup>. The Basel III text also sets out LGD floors for different types of retail exposure (see below)<sup>443</sup>.

5.11.14 The number of exposures in each pool must be sufficient to allow for a meaningful differentiation of risk and provides for a grouping of sufficiently homogenous exposures, and allows for accurate and consistent estimates of loss characteristics at pool level<sup>444</sup>. When assigning exposures to a pool, banks are required to consider:

(a) borrower characteristics (borrower type, demographics);

- (b) transaction characteristics (whether the bank possesses security, seniority of the security, any guarantees, etc.); and
  - (c) whether the exposure is performing or in default<sup>445</sup>.
- 5.11.15 Banks must review the loss characteristics and status of each pool at least on an annual basis. They must also review the status of individual borrowers within each pool to ensure that the underlying borrowers continue to be assigned to the correct pool. However, this requirement can be met through the review of a representative sample of exposures<sup>446</sup>.
- 5.11.16 Once banks have identified the pools, they are required to calculate the probability of default (PD) for each pool of loans. The bank will also determine the LGD for each pool<sup>447</sup>.
- 5.11.17 The PD and LGD figures are then fed into the supervisory formulae to determine the risk weights. There are three separate formulae<sup>448</sup> for: (i) residential mortgages<sup>449</sup>, (ii) qualifying revolving retail exposures<sup>450</sup> and (iii) all other retail exposures<sup>451</sup>. For LGD the following floors apply. Retail mortgages attract a minimum 5% LGD. For qualifying revolving retail exposures, the figure is 50%. For other retail exposures, the minimum LGD on unsecured exposures is 30% and between 0% and 15% for secured exposures, depending on the type of collateral provided<sup>452</sup>.
- 5.11.18 The bank then multiplies the capital charge for each pool of assets by the exposure at default multiplied by 12.5 to determine the RWA for that pool<sup>453</sup>. For on-balance sheet exposures EAD is the current drawn amount. Off-balance sheet items are converted into notional on-balance sheet exposures using the bank's own estimates of the credit conversion factors for undrawn revolving commitments to extend credit, purchase assets or issue credit substitutes, provided the exposure does not attract a 100% credit conversion factor under the standardised approach. All other items (e.g. undrawn non-revolving commitments) attract the credit conversion factors specified under the standardised approach<sup>454</sup>. A floor also applies to the use of own estimates of EAD<sup>455</sup>. For retail exposures with uncertain future drawdown (e.g. credit cards), banks are required to take into account the history and/or expectation of additional drawings prior to default. This may be done through an adjustment to either the LGD or EAD figures<sup>456</sup>.
- 5.11.19 If a bank provides foreign exchange or interest rate commitments to a retail customer, it is not permitted to use its internal model to determine the capital charge and is, instead, required to apply the capital charge under the standardised approach<sup>457</sup>.

## 5.12 Common Definition of Default

- 5.12.1 The risk components used under the IRB approaches (PD, LGD and EAD) are all based on the default of the borrower. In order to ensure consistency between banks that apply IRB, Basel III sets out a common reference definition of default. All banks are required to use this definition in determining PD and, for banks that use the advanced IRB approach, LGD and EAD as well. This definition is not intended to affect a bank's legal rights or the way in which a loan is accounted for. However, there may be practical benefits for banks to

ensure that their loan documentation is consistent with the reference definition of default as this will govern the capital treatment.

- 5.12.2 Where a bank relies on collateral, guarantees or credit derivatives to reduce the credit risk on an exposure, the circumstances in which the bank may resort to the collateral, or draw on the guarantee or credit derivative, must be compatible with the definition of default to attract capital relief.
- 5.12.3 A default is considered to have occurred when either or both of the following events take place:
- (a) the bank considers that the obligor is unlikely to pay its credit obligations to the banking group in full, without recourse by the bank to actions such as realising security (if held); and/or
  - (b) the obligor is past due more than 90 days on any material credit obligation to the banking group. Overdrafts are considered to be past due if the customer has breached an advised limit or has been advised of a limit smaller than current outstandings<sup>458</sup>.
- 5.12.4 In the case of exposures to public sector entities, and retail exposures, national supervisors may substitute a 180 day period for the 90 day reference period<sup>459</sup>.
- 5.12.5 The elements taken as indications of unlikelihood to pay include:
- (a) the bank puts the credit obligation on non-accrued status;
  - (b) the bank makes a charge-off or account-specific provision resulting from a significant perceived decline in credit quality subsequent to the bank taking on the exposure;
  - (c) the bank sells the credit obligation at a material credit-related economic loss;
  - (d) the bank consents to a distressed restructuring where this is likely to result in a diminished financial obligation caused by the material forgiveness, or postponement, of principal, interest or fees;
  - (e) the bank has filed for the borrower's bankruptcy, or a similar order, in respect of the obligor's credit obligation to the banking group; or
  - (f) the borrower has sought or has been placed in bankruptcy or similar protection where this would avoid or delay repayment of the credit obligation to the banking group<sup>460</sup>.
- 5.12.6 National supervisors are required to provide appropriate guidance as to how these elements must be implemented and monitored in each jurisdiction<sup>461</sup>.
- 5.12.7 For retail exposures, the definition of default may be applied at the level of a particular facility, rather than at the level of the obligor. As such, default by a borrower on one obligation does not require a bank to treat all other

obligations as defaulted<sup>462</sup>. This reflects the fact that default is much more common in certain facilities (e.g. credit cards) than others (e.g. mortgages).

### 5.13 Corporate Specialised Lending

- 5.13.1 Basel III makes provision for five separate sub-classes of specialised lending<sup>463</sup>. These are sub-classes of the corporate portfolio, although owing to the greater risks involved, and concerns as to the accuracy of banks' internal models and data, they are subject to additional requirements, or supervisory estimates. In respect of all sub-classes banks may apply both the foundation or advanced IRB approach if they can satisfy the requirements for the calculation of PD and the other risk components<sup>464</sup>. If they are unable to do so (e.g. because of a lack of data), there exist standard supervisory risk weights that apply to banks that otherwise use an IRB approach to corporate exposures<sup>465</sup>. This is referred in Basel III as the "supervisory slotting" criteria approach<sup>466</sup>, and requires banks to map their own internal risk grades to five supervisory categories, each of which is assigned a specific risk weight<sup>467</sup>.
- 5.13.2 Specialised lending is considered to involve the following characteristics, either in legal form or economic substance:
- (a) the exposure is typically to an entity (such as an SPV) that was specifically created to finance and/or operate physical assets;
  - (b) the borrowing entity has little or no other material assets or activities, and therefore little or no independent capacity to repay the obligation, apart from the income received;
  - (c) the terms of the obligation give the lender a substantial degree of control over the assets and the income that they generate; and
  - (d) as a result of the foregoing, the primary source of repayment is the income generated by the assets<sup>468</sup>.
- 5.13.3 The general restriction on using the advanced IRB approach for large corporate exposures (i.e. group revenues of more than €500 million) does not apply to specialised lending<sup>469</sup>.

#### *Project finance*

- 5.13.4 This is a method of funding in which the lender looks primarily to the revenues generated by a single project, both as the source of repayment and as security for the exposure. This type of financing is commonly employed for large, complex and expensive installations including, for example, power plants, chemical processing plants, mines, transportation, environment and telecommunications infrastructure<sup>470</sup>.
- 5.13.5 Banks that are able to meet the requirements for calculating PD may use the general foundation approach for corporates to derive the appropriate risk weights (see above). Advanced IRB banks that are able to calculate PD, LGD and EAD may use the advanced approach for corporate exposures.



- 5.13.6 Banks that cannot meet the requirements for calculating PD are required instead to map their internal ratings to five supervisory categories to determine the risk weights. The supervisory categories and risk weights for unexpected losses are as follows<sup>471</sup>:

Strong	Good	Satisfactory	Weak	Default
70%	90%	115%	250%	0%
BBB- or better	BB+ or BB	BB- or B+	B to C-	N/A

- 5.13.7 Banks are required to map their exposures to the five categories. The ratings broadly correspond to the categories<sup>472</sup>, and as such cannot be used as a substitute for express allocation of exposures to the categories. The mapping process must be carried out in accordance with the Basel III text and not by directly relying on the ratings in the table above<sup>473</sup>.
- 5.13.8 A 0% figure applies to defaulted assets<sup>474</sup> as by this time there should be no unexpected loss and the expected loss triggers a separate capital charge.
- 5.13.9 At national discretion, supervisors may allow banks to assign preferential risk weights of 50% to “strong” exposures and 70% to “good” exposures provided they have a remaining maturity of less than two and a half years or if the supervisor determines that the banks’ underwriting and other risk characteristics are substantially stronger than those specified in the relevant risk category<sup>475</sup>. It seems that this discretion must apply to all banks in the relevant jurisdiction.
- 5.13.10 The capital charge for unexpected loss equals the risk weight set out above multiplied by the exposure at default multiplied by 8%<sup>476</sup>.
- 5.13.11 The capital charge for expected losses under the supervisory slotting approach is as follows<sup>477</sup>.

Strong	Good	Satisfactory	Weak	Default
5%	10%	35%	100%	625%

- 5.13.12 Where a national supervisor allows a preferential risk weight for exposures that are “strong” or “good” for unexpected losses then a corresponding preferential treatment is available for expected losses of 0% and 5% respectively<sup>478</sup>.

#### *Object finance*

- 5.13.13 Object finance is a method of funding the acquisition of physical assets (e.g. ships, aircraft, railway carriages or fleets) where repayment is dependent on the cash flows generated by the specific assets that have been financed and pledged or assigned to the lender. A primary source of cash flows might be rental or lease contracts with third parties. If the loan is to a borrower whose financial condition and debt servicing capacity enables it to repay the debt without undue reliance on the specifically pledged assets it should be treated as a collateralised corporate exposure<sup>479</sup>.

- 5.13.14 Banks that are able to calculate PD under the corporate IRB approach may apply the foundation IRB approach for corporate exposures. Banks that can calculate LGD and EAD as well may apply the advanced approach.
- 5.13.15 Banks that are not able to determine PD must map their object finance exposures to the five supervisory categories (see above). Requirements in respect of the mapping process are set out in the text of Basel III<sup>480</sup>.

#### *Commodities finance*

- 5.13.16 This category consists of short-term lending to finance reserves, inventories or receivables of exchange-traded commodities (e.g. crude oil, metals, crops) where the exposure will be repaid from the proceeds of the sale of the commodity and the borrower has no independent capacity to repay<sup>481</sup>. The structured nature of this type of finance compensates for the weak credit quality of the borrower<sup>482</sup>. Such lending can be distinguished from lending financing the reserves, inventories or receivables of other more diversified corporate borrowers where the value of the commodity serves as a risk mitigant rather than as the primary source of repayment<sup>483</sup>.
- 5.13.17 The capital treatment is exactly the same as for project finance and object finance (see above) with mapping to the five supervisory categories as set out in the Basel III text<sup>484</sup>.

#### *Income producing real estate*

- 5.13.18 This exposure class encompasses lending in respect of real estate, offices-to-let, retail space, multi-family residential buildings, industrial and warehouse space and hotels where the prospects for repayment and recovery depend primarily on cash flows generated by the asset. The primary source of repayment will therefore be lease or rental payments, or the sale of the asset. The borrower is generally (but not necessarily) an SPV, an operating company focused on real estate construction or holdings, or an operating company with other sources of income<sup>485</sup>. The distinguishing feature of this type of lending (as compared with collateralised real estate lending) is the strong positive correlation between the prospects for repayment of the loan and recovery in default, with both depending primarily on the cash flows generated by the property<sup>486</sup>.
- 5.13.19 The capital treatment (with mapping to the five supervisory categories for banks that cannot calculate PD<sup>487</sup>) is the same as for the three previous specialised lending categories.

#### *High volatility commercial real estate*

- 5.13.20 The final category of specialised lending is the financing of commercial real estate that exhibits higher loss rate volatility (i.e. higher asset correlation) compared with other types of specialised lending. It includes:
- (a) commercial real estate exposures secured by properties categorised by the national supervisor as sharing higher volatilities in portfolio default rates;

- (b) loans financing the acquisition, development and construction (ADC) of properties of those types in such jurisdictions; and
- (c) loans financing ADC of other properties where the source of repayment is either the future uncertain sale of the property or cash flows whose source of repayment is substantially uncertain, unless the borrower has substantial equity at risk<sup>488</sup>. Where there is such equity the loan may be exempted from the high volatility commercial real estate category, but does not benefit from any preferential risk weights for certain exposures<sup>489</sup>.

5.13.21 It is for each national supervisor to determine which loans fall into the high volatility commercial real estate category in their jurisdiction. Banks in other jurisdictions are required to apply the same treatment to such loans that they have in that jurisdiction<sup>490</sup>.

5.13.22 National supervisors determine whether or not to permit banks to apply the foundation or advanced IRB approach to high volatility commercial real estate<sup>491</sup>. Banks that are allowed to apply the foundation or advanced IRB approach use a modified formula in calculating the risk weights, to reflect the higher degree of risk in such lending<sup>492</sup>. If the banking supervisor does not permit banks to apply an IRB approach, or if a bank is unable to calculate PD, then the risk weights for unexpected loss in the high volatility commercial real estate category are as follows<sup>493</sup>:

Strong	Good	Satisfactory	Weak	Default
95%	120%	140%	250%	0%

5.13.23 Once again, requirements for the mapping process are set out in Basel III<sup>494</sup>.

5.13.24 As with other specialised lending sub-classes (but not for exempt high volatility commercial real estate) national supervisors may reduce the risk weight for “strong” and “good” exposures that meet certain criteria to 70% and 95% respectively<sup>495</sup>.

5.13.25 The capital charge is determined in exactly the same way as for the other categories of specialised lending using the different risk weights<sup>496</sup>.

5.13.26 The risk weights for expected losses are set out in the following table<sup>497</sup>.

Strong	Good	Satisfactory	Weak	Default
5%	5%	35%	100%	625%

5.13.27 There is no preferential treatment available for expected losses in this class<sup>498</sup>.

## 5.14 Defaulted Exposures

5.14.1 The capital requirement for a defaulted exposure is equal to the greater of zero and the difference between its loss given default (LGD) and the bank’s best estimate of expected loss (EL). The risk-weighted asset amount for the defaulted exposure is the product of the capital charge multiplied by 12.5 multiplied by the exposure at default<sup>499</sup>.

## 5.15 Equity Exposures

- 5.15.1 The equity portfolio comprises exposures to equities based on the economic substance of the instrument. The following criteria apply (which are identical to the definition under the standardised approach):
- (a) the instrument is irredeemable;
  - (b) it does not embody an obligation on the part of the issuer; and
  - (c) it conveys a residual claim on the assets or income of the issuer<sup>500</sup>.
- 5.15.2 Regardless of whether this definition is met or not, the following instruments are automatically classified as equity exposures:
- (a) instruments with the same structure as those permitted as Tier 1 capital (e.g. some preference shares and perpetual subordinated debt); and
  - (b) instruments that embody an obligation on the part of the issuer and meet any of the following conditions:
    - (i) the issuer may indefinitely defer settlement;
    - (ii) the obligation permits or requires settlement by a fixed number of ordinary shares;
    - (iii) the obligation permits or requires settlement by a variable number of ordinary shares; or
  - (c) the holder has the option to require settlement in ordinary shares unless the supervisor considers this treatment not to be appropriate<sup>501</sup>; and
  - (d) securities structured with the intent of conveying the economic substance of equity holdings<sup>502</sup>.
- 5.15.3 Unlike the position under Basel II, there is no IRB approach to equity exposures. The purpose of this definition is therefore an exclusionary one as any equity exposures must be risk-weighted under the standardised approach<sup>503</sup> (unless they are equity investments in funds, for which the specific rules on funds apply). Application of the definition set out in the standardised approach is therefore entirely logical.

## 5.16 Purchased Receivables

- 5.16.1 The rules for purchased receivables distinguish between corporate receivables and retail receivables<sup>504</sup>. Purchased retail receivables are eligible for the top-down approach<sup>505</sup>. For corporate receivables Basel III generally requires such exposures to be treated as corporate exposures under the IRB approach applicable to that portfolio. However, the top-down approach may be used instead where it would be unduly burdensome for a bank to comply with the general IRB corporate approach. According to Basel III the top-down approach is mainly intended for receivables that are purchased for inclusion in asset-backed securitisation structures, but can be used for appropriate on-balance

sheet exposures with supervisory permission that share the same features<sup>506</sup> (presumably, such as warehousing).

#### *Corporate receivables*

- 5.16.2 To be eligible for the top-down treatment, corporate receivables must satisfy the following conditions:
- (a) the receivables are purchased from unrelated third party sellers, and the bank must not have directly or indirectly originated them;
  - (b) the receivables are generated on an arm's-length basis. Intra-group receivables are accordingly ineligible;
  - (c) the purchasing bank has a claim on all proceeds from the pool (or a pro-rata share if it does not purchase the whole pool); and
  - (d) the pool meets concentration requirements to prevent an undue concentration of risk to a few counterparties. These limits are set by national supervisors<sup>507</sup>.
- 5.16.3 Where a bank purchases a claim on a tranche of receivables, the securitisation framework applies<sup>508</sup>.
- 5.16.4 For corporate exposures there is both a foundation and an advanced IRB approach, although the advanced IRB approach can only be used for purchased receivable from corporates in respect of which the advanced IRB approach is permitted to be used (i.e. smaller companies and specialised lending). For purchased retail receivables only the advanced IRB approach is available, in line with the treatment of retail exposures under Basel III<sup>509</sup>.
- 5.16.5 There are IRB capital charges for both default risk and dilution risk<sup>510</sup>.

#### *Default risk*

- 5.16.6 Receivables that belong only to one asset class (as defined in the Basel III standard) receive a risk weight for default risk based on the risk weight appropriate for that asset class<sup>511</sup>. In other cases, different rules apply. Thus, if a bank cannot meet the requirements for qualifying revolving retail exposures for purchased receivables in that class, it must use the risk-weight function for other retail exposures. Hybrid pools attract the highest capital requirements of any of the exposures in that pool<sup>512</sup>.
- 5.16.7 Generally, a bank must use the standard IRB approach for purchased corporate receivables. However, with supervisory approval, a bank may use the following top-down approach. The bank will estimate the one-year expected loss (EL) for default risk in the pool. This is an estimate of the percentage of the overall nominal amount in the pool anticipated to default over the next year. Given the expected loss, the risk weight for the pool is determined by using the risk weight function for corporate exposures. The precise method of calculating the risk weight function depends on whether the bank applies the foundation or the advanced IRB approach, and whether the bank can decompose EL into its PD and LGD components<sup>513</sup>.

- 5.16.8 Banks that are able to estimate PD will determine the risk weight in the same way as for other corporate exposures<sup>514</sup>.
- 5.16.9 If the bank is unable to decompose EL into PD and LGD components then the risk weight is determined as follows. If the pool consists solely of senior claims an LGD of 40% is used. PD is determined by dividing EL by this LGD. EAD is the outstanding amount less the capital charge for dilution prior to application of any credit risk mitigants. EAD for a revolving purchase facility is the current nominal amount plus 40% of any undrawn purchase commitments less the dilution amount<sup>515</sup>.
- 5.16.10 Otherwise, where the pool consists of both senior and subordinated receivables, PD is the bank's estimate of EL. In this case the LGD is 100% and EAD is the outstanding amount less the capital charge for dilution. EAD for a revolving purchase facility is the sum of the current amount of receivables purchased plus 40% of any undrawn commitment less the capital charge for dilution<sup>516</sup>.
- 5.16.11 Under the advanced approach, banks can either estimate the pool's default-weighted average loss rates given default, or average PDs<sup>517</sup>. Banks may use either an appropriate PD estimate to infer the long-run default-weighted average loss rate or use a long-run default-weighted average loss rate to infer PDs. Banks will then use the PD and LGD figures to calculate the risk weight function applying the formula for corporate exposures. The EAD for purchased corporate receivables is the nominal amount less the capital charge for dilution (see above)<sup>518</sup>. For revolving purchased facilities EAD is calculated in the same way as for foundation IRB banks (i.e. the nominal amount plus 40% of any undrawn purchase commitments less the dilution amount). Banks on the advanced approach are not permitted to apply their own estimates of EAD<sup>519</sup>. As with other advanced IRB portfolios, the bank must then apply a maturity adjustment<sup>520</sup>.

#### *Retail receivables*

- 5.16.12 The IRB treatment for retail receivables is similar to the advanced approach to corporate receivables (although, of course, the relevant retail risk weight functions apply and not the corporate risk weight function).
- 5.16.13 The bank calculates the PD and LGD (or EL) for each of the three sub-classes of retail exposures (mortgages, qualifying revolving retail exposures and other exposures). External and internal data may be used, and the estimates for PD and LGD, or EL, must be calculated without any assumption of recourse from the seller<sup>521</sup>. Specific rules apply to the calculation of  $M$ <sup>522</sup>.

#### *Dilution risk for both corporate and retail exposures*

- 5.16.14 Dilution is the risk that the amount received from a debtor is reduced through cash or non-cash payments to, or set-off against, the original creditor. Examples include goods returned to seller, disputes regarding product quality, promotional discounts offered by the original creditor, and set-offs between the borrower and the creditor<sup>523</sup>. Unless a bank can demonstrate to its supervisor that the risk of dilution is immaterial, it must make an adjustment to the value of exposures in the pool to reflect this risk<sup>524</sup>.

- 5.16.15 Banks are required to calculate the one year expected loss (EL) from dilution. This may be determined using both external and internal data<sup>525</sup>. Either a top-down (whole pool) or a bottom-up (individual exposures) approach may be used. The amount is determined as follows. The expected loss is used as the PD figure in the corporate risk weight function, and a LGD of 100% is assumed (these will be actual losses). The amount is then subject to an appropriate maturity adjustment. If the maturity risk is appropriately monitored and able to be resolved within one year, a one year maturity applies<sup>526</sup>.
- 5.16.16 This treatment for dilution risk applies regardless of whether the receivables are corporate or retail<sup>527</sup>.

*Purchase price discounts and credit risk mitigation*

- 5.16.17 Where receivables are purchased at a discount, and the discount serves to provide “first loss” protection against default and dilution losses, the purchasing bank may recognise this. Refundable purchase price discounts may be treated as first loss protection under the Basel III framework for securitisation. Non-refundable purchase price discounts do not affect the EL provision or the calculation of risk weighted assets<sup>528</sup>. Collateral and guarantees providing first loss protection may also be recognised under the securitisation framework<sup>529</sup>.

## 5.17 Treatment of Expected Losses

- 5.17.1 At a late stage before the final text was published, Basel II was amended to adopt a more refined treatment of expected losses. Unexpected losses are taken account of through the IRB capital charge for credit risk. Expected losses, on the other hand, are measured against provisions with any additional losses subject to a deduction from capital.
- 5.17.2 The rules on expected losses therefore require banks to calculate both losses and provisions.

*Expected losses*

- 5.17.3 Banks must sum the expected loss amount for all exposures subject to the IRB treatment. This is equal to EL multiplied by EAD. EL amounts attributable to securitisation exposures are excluded from this calculation<sup>530</sup>.
- 5.17.4 For sovereign, bank, corporate and retail exposures not in default expected losses equal PD multiplied by LGD. For exposures in default, banks must either use supervisory LGD estimates (foundation IRB approach) or their best estimate of expected loss (advanced IRB). Specialised lending exposures are subject to the supervisory slotting approach<sup>531</sup>.

*Provisions*

- 5.17.5 Total eligible provisions are all provisions (specific provisions, partial write-offs, portfolio-specific general provisions, provisions for country risk, etc.) attributed to exposures under the IRB approach. Discounts on defaulted assets may also be included. However, specific provisions for securitisation exposures must be excluded<sup>532</sup>.

- 5.17.6 Where a bank applies both the standardised approach and an IRB approach to credit risk, provisions must be separately allocated on a pro rate basis to cover expected losses on loans subject to the standardised approach and those using an IRB approach<sup>533</sup>. At national discretion, banks using both the standardised and one or more IRB approaches may rely on internal methods for allocating general provisions<sup>534</sup>. Prior supervisory approval is required.

#### *Capital charges*

- 5.17.7 Banks must deduct the total EL amount from the total of eligible provisions<sup>535</sup>.
- 5.17.8 If the EL amount exceeds eligible provisions then this is deducted from common equity Tier 1 capital<sup>536</sup>.
- 5.17.9 If the EL amount is less than total eligible provisions then banks may recognise the excess provisions as Tier 2 capital up to a maximum of 0.6% of credit risk weighted assets. Supervisors may set a lower limit as a national discretion under Basel III<sup>537</sup>. Supervisors must consider whether the expected loss figure fully reflects the conditions in the market in which banks operate before allowing the difference to be included in Tier 2 capital. If specific provisions exceed expected losses on defaulted assets then the same assessment must also be made<sup>538</sup>.

#### *Securitisation*

- 5.17.10 Expected losses on securitisation positions are excluded from the above treatment<sup>539</sup>. However, originator banks can offset 1250% risk-weighted securitisation exposures by the amount of specific provisions on the underlying securitised assets and non-refundable purchase discounts<sup>540</sup>.

### **5.18 Transitional Arrangements for Equity Exposures subject to an IRB treatment under Basel II**

- 5.18.1 Basel III contains limited transitional provisions addressing the withdrawal of any IRB approach to equity exposures on 1 January 2023. No transitional provisions apply to the withdrawal of the advanced IRB approach to bank, securities firm and large corporate exposures.
- 5.18.2 The requirement to use the standardised approach to all equity exposures is subject to a five year linear phase-in arrangement from 1 January 2023. During the phase-in period the risk weight for equity exposures is the greater of:
- (a) the risk weight calculated using the IRB approach applied to equity exposures before 1 January 2023; and
  - (b) the risk weight applicable under the transitional arrangements for the treatment of equity exposures under the standardised approach<sup>541</sup>. For ease of understanding this will be repeated below.
- 5.18.3 Speculative unlisted equity exposures are risk-weighted starting at 100% increasing by 60 percentage points at the end of each year until year 5 (i.e. 2028).



- 5.18.4 All other equity exposures are risk-weighted at 100% increasing by 30 percentage points until year 5<sup>542</sup>.
- 5.18.5 National supervisors may require banks to apply the fully phased-in standardised treatment from 1 January 2023<sup>543</sup>.

## 6. CREDIT RISK MITIGATION

### 6.1 Introduction

- 6.1.1 Credit risk mitigation refers to certain techniques which banks can use to reduce the credit risk on their loans or other portfolios of exposures, for example, by taking collateral, purchasing credit protection under a credit derivative, receiving a guarantee, or entering into an on-balance sheet netting agreement. Credit risk mitigation plays an important role in reducing a bank's exposure on the default of a counterparty or borrower. The rules set out in Basel III apply to credit risk mitigation techniques used in a bank's banking book.
- 6.1.2 There are three different regimes for credit risk mitigation, and the rules applicable to a bank depend on whether it applies the standardised approach, the foundation IRB approach or the advanced IRB approach (where the advanced approach is permitted).
- 6.1.3 All banks that use credit risk mitigation techniques to reduce their capital requirements are required to make certain disclosures under Pillar 3 (market disclosure). Banking supervisors are also empowered to take account of risks inherent in credit risk mitigation (e.g. legal, operational, liquidity and market risks) under Pillar 2. This is because although such techniques may reduce credit risk they may simultaneously increase other risks. Banks are therefore required to employ robust procedures and processes to address these risks, including strategy, consideration of the underlying credit, valuation and control of roll-off risks (where the risk mitigation technique has a shorter maturity than the exposure)<sup>544</sup>.
- 6.1.4 Banks that use credit risk mitigation techniques are not required to hold more capital against an exposure than had no such techniques been used<sup>545</sup>. Further, credit risk mitigation must not be double counted, meaning that where such techniques are already taken into account in determining the risk weight, no additional reduction in capital charges is allowed<sup>546</sup>.
- 6.1.5 Where a bank has multiple credit risk mitigation techniques covering a single exposure (e.g. collateral and a credit derivative) the bank is required to divide the exposure into portions notionally covered by each type of technique, calculating the risk weight on each such notional exposure. The same applies where the techniques used have different maturities<sup>547</sup>.

### 6.2 Legal Certainty

- 6.2.1 For all types of credit risk mitigation banks must ensure that the documentation used is binding on all parties and is enforceable in all relevant jurisdictions. Basel III requires banks to have conducted sufficient legal review to verify this, and to have a well-founded basis to reach this conclusion. Banks must periodically review the legal position to ensure continuing enforceability<sup>548</sup>. Given that Basel III does not require an external

legal opinion, banks may determine how to satisfy this (subject to any additional requirements imposed by their supervisor).

### 6.3 Credit Risk Mitigation under the Standardised Approach

- 6.3.1 The standardised approach distinguishes between collateral, on-balance sheet netting, guarantees and credit derivatives. The credit risk mitigation technique must not bear a material positive correlation with the credit quality of the counterparty, or the resulting residual risks<sup>549</sup>. An example would be taking as collateral securities issued by the debtor, or a guarantee by the obligor of its own debt.

#### *Collateral*

- 6.3.2 A collateralised transaction is where a bank has a credit exposure, or potential credit exposure, and this is hedged by collateral posted by the counterparty, or by a third party on its behalf<sup>550</sup>.
- 6.3.3 Before capital relief will be granted in respect of collateral, a bank must satisfy the following conditions:
- (a) Firstly, the bank must have a right to liquidate or take legal possession of the collateral, in a timely manner, on the default of the counterparty (including on its insolvency) and (where applicable) of the custodian holding the collateral<sup>551</sup>.
  - (b) Secondly, banks must take all steps necessary to obtain and maintain an enforceable security interest under the law applicable to the bank's interest in the collateral (e.g. complying with any applicable registration requirements, such as a filing in respect of security granted by an English company)<sup>552</sup>.
  - (c) Thirdly, there must not be a positive correlation between the value of the collateral and the credit quality of the obligor<sup>553</sup>. Unless this is the case, the collateral will provide little protection against the default of the obligor.
  - (d) Fourthly, a bank must have clear and robust procedures for the timely liquidation of collateral to ensure that any legal conditions in respect of a declaration of default of the borrower are observed, and the collateral can be liquidated promptly<sup>554</sup>.
  - (e) Fifthly, where a bank holds collateral through a custodian it must take reasonable steps to ensure that the custodian segregates the collateral from its own assets<sup>555</sup>.
- 6.3.4 No collateralised claim should result in a higher capital requirement than an otherwise identical claim for which there is no collateral<sup>556</sup>. Where the effect of collateral has already been taken into account in determining the rating applicable to an exposure (e.g. in a securitisation tranche or retail mortgage lending under the standardised approach), then any collateral provided will not further reduce the capital charge<sup>557</sup>.

- 6.3.5 Basel III sets out both a simple approach and a comprehensive approach to collateral. Banks may choose which approach to use<sup>558</sup>, but may not use both<sup>559</sup>. For collateralised OTC derivative transactions, exchange traded derivatives and long settlement transactions banks may use either the standardised approach for counterparty credit risk or an internal models approach<sup>560</sup>.

#### *Eligible assets*

- 6.3.6 Under the simple approach the following assets are eligible as collateral:

- (a) cash on deposit with the lending bank (including certificates of deposit, or comparable instruments)<sup>561</sup>;
- (b) gold;
- (c) (where external ratings are permitted to be used) securities rated BB- and above issued by sovereigns and public sector entities treated as sovereigns under the standardised approach;
- (d) (where external ratings are permitted to be used) securities issued by banks, securities firms and corporates that are rated BBB- and above;
- (e) (where external ratings are permitted to be used) short-term debt instruments rated A-3/P-3 or better;
- (f) certain listed liquid unrated senior bank debt where all rated debt is investment grade (conditions apply);
- (g) (in jurisdictions that do not allow the use of external ratings) equivalent securities to the last four points where issued by a sovereign, a bank assigned to grade A under the standardised approach, debt securities treated as “investment grade” under the standardised approach, and securitisation exposures with a risk weight of less than 100% under the securitisation standardised approach;
- (h) equities and convertible bonds included in a main index; and
- (i) interests in mutual funds and UCITS that are publicly quoted daily and limited to investing in any of the foregoing<sup>562</sup>.

- 6.3.7 Equities and convertible bonds not included in a main index, but traded on a recognised exchange (and UCITS/mutual funds which include such equities), may be used as collateral under the comprehensive approach<sup>563</sup>.

- 6.3.8 Re-securitisation exposures (such as collateralised debt obligations) are not eligible financial collateral<sup>564</sup>.

#### *The simple approach to collateral*

- 6.3.9 The simple approach is primarily intended for banks that engage only to a limited extent in collateralised transactions, and for whom applying the more detailed rules under the comprehensive approach would be unduly

burdensome. As the approach is less accurate, the capital charges for banks applying the simple approach are generally higher than under the comprehensive approach. The approach taken is a substitution approach so the effect of a bank holding collateral is to substitute an exposure to the issuer of the collateral for the original counterparty exposure<sup>565</sup>. A corporate loan fully secured with government securities will therefore be treated as an exposure to the relevant government subject to the capital floor of 20% (see below).

- 6.3.10 Under the simple approach, collateral must be pledged for at least the life of the exposure, and must be marked to market and revalued at least every six months. No capital relief will be provided in respect of collateral provided for a period shorter than the life of the exposure. The risk weight applicable to collateralised claims is equal to the risk duration of the collateral instrument. This is subject to a floor of 20%, so that under the simple approach banks are required to hold capital against one fifth of the exposure (which is assigned the risk weight of the bank's underlying counterparty)<sup>566</sup>. Thus for the hypothetical corporate loan secured by government securities the bank must hold capital equal to 20% of the value of the original loan. Currency mismatches are disregarded under the simple approach due to the 20% floor<sup>567</sup>.

#### *Exceptions to the 20% floor*

- 6.3.11 There is an exception to the 20% floor for certain repo-style transactions that are either (i) overnight or (ii) marked-to-market and re-margined on a daily basis. These receive a counterparty risk weight of either 0% or 10%. Both the exposure and the collateral must be cash or zero risk-weighted government or public securities. The exposure and the collateral must be denominated in the same currency. The transaction is required to settle across a settlement system proven for the type of transaction and to meet various documentation requirements. Upon a default, the bank must have an unfettered enforceable right to seize and liquidate the collateral<sup>568</sup>.
- 6.3.12 If the transaction is entered into with a "core market participant" it receives a 0% risk weight. Otherwise the transaction is risk weighted at 10%<sup>569</sup>. The definition of "core market participant" is determined by the relevant supervisor. It may include sovereigns and central banks, banks and securities firms, other financial firms eligible for a 20% risk weight, regulated mutual funds, regulated pension funds and certain central counterparties<sup>570</sup>.

#### *Specific collateralised transactions*

- 6.3.13 OTC derivative transactions that are subject to daily marking-to-market, which are cash collateralised and where there is no currency mismatch, are risk-weighted at 0%. If the exposure is collateralised by government or public securities qualifying for a 0% risk weight then the risk weight for the transaction is 10%.
- 6.3.14 A 0% risk weight may also be applied to the collateralised part of transactions where the exposure and the collateral are denominated in the same currency and either:

- (a) the collateral consists of cash on deposit; or
- (b) the collateral consists of government or public sector securities eligible for a 0% counterparty risk weight *and* the market value of the collateral has been discounted by 20%<sup>571</sup>.

#### *The comprehensive approach to collateral*

- 6.3.15 The comprehensive approach seeks to achieve a more accurate measurement of the effect of collateral in reducing risk. The comprehensive approach is based on the fact that where a bank holds collateral against an exposure, it is exposed to additional risks than simply the default of the issuer of the collateral. For example, if the collateral is only revalued periodically the market value of the collateral, when the bank comes to sell it, may have fallen below the level of the exposure. Equally, by that time the size of the exposure may have increased (e.g. on a securities loan). Where the collateral and the exposure are denominated in different currencies, the bank is exposed to foreign exchange risk. When a bank seeks to realise its security interest, it may also find that it lacks good title (for example, because the collateral agreement is unenforceable) or that the collateral is economically worthless. For these reasons a straightforward substitution approach does not capture all the risks arising out of such transactions<sup>572</sup>.
- 6.3.16 Basel III seeks to take account of these additional risks through applying various “haircuts” (i.e. reductions) to the value of collateral to recognise the risk that the collateral may not fully cover the exposure on a counterparty’s default.

#### *“Haircuts”*

- 6.3.17 Firstly, under the comprehensive approach banks are required to apply a “haircut” to the value of the collateral. This is to protect the bank against the risk of changes in the value of the collateral.
- 6.3.18 Secondly, a “haircut” is applied to the collateral in respect of the underlying exposure. This catches the risk that the size of the exposure may itself change over time. No “haircut” is applied to the exposure itself.
- 6.3.19 Where the collateral is denominated in a currency other than that of the exposure, a third “haircut” is applied<sup>573</sup> to the collateral to take account of possible foreign exchange movements<sup>574</sup>.
- 6.3.20 The size of the haircut depends on the prescribed holding period i.e. the assumed period of time over which exposure or collateral values are assumed to move before the bank can close out the transaction<sup>575</sup>. This varies depending on the type of instrument, type of transaction, residual maturity and frequency of marking-to-market and re-margining<sup>576</sup>. The exposure amount after risk mitigation is then multiplied by the risk weight of the counterparty to obtain the risk-weighted asset amount for the collateralised transaction<sup>577</sup>.
- 6.3.21 The comprehensive approach consists of a set of different “haircuts” depending on whether the national supervisor does<sup>578</sup> or does not<sup>579</sup> allow use

of external credit ratings. For repo-style transactions, other capital market transactions and secured lending there are prescribed holding periods<sup>580</sup>. If the frequency of re-margining or revaluation is longer than the minimum, the haircut is scaled upwards<sup>581</sup>.

- 6.3.22 Under Basel II it was possible to use (with supervisory approval) own estimates of “haircuts”, as well as VaR models, to calculate credit risk on certain transactions. These options have now been removed for banks applying the standardised approach.
- 6.3.23 The carve-out for certain repo-style transactions in government securities (with no floor and no “haircuts”) referred to above in connection with the simple approach is also available under the comprehensive approach to collateral<sup>582</sup>.

#### *Master netting agreements*

- 6.3.24 Bilateral master netting agreements covering securities financing transactions may be recognised provided that the agreements are legally enforceable in each relevant jurisdiction upon a default. The agreement must (i) provide the non-defaulting party the right to terminate and close-out all transactions, (ii) provide for the netting of gains and losses and (iii) allow the prompt liquidation or set-off of collateral following default<sup>583</sup>. Transactions may be netted across the banking and trading books provided all transactions are marked-to-market daily and the collateral is recognised as eligible financial collateral in the banking book<sup>584</sup>. A formula is used to calculate the counterparty credit risk requirement based on the current exposure, an amount for the idiosyncratic exposure of the securities based on the gross exposure, and an amount for currency mismatches<sup>585</sup>.

#### *On-balance sheet netting*

- 6.3.25 A bank may use on-balance sheet netting agreements to reduce its exposure to a counterparty. The effect of a netting agreement is that (subject to a “haircut” where there is a currency mismatch) the bank is required to hold capital against the net, as opposed to the gross, exposure to that counterparty. Under Basel III, a bank may net loans and deposits to or from a single counterparty<sup>586</sup>. Netting agreements relating to assets other than loans and deposits, and multi-lateral netting agreements, are not recognised for regulatory capital purposes as their legal enforceability is not considered to be sufficiently well established.
- 6.3.26 For a netting agreement to be recognised, the following requirements must be met:
  - (a) the bank has a well-founded legal basis for concluding that the netting or offsetting agreement is enforceable in each relevant jurisdiction (including on insolvency);
  - (b) the bank is able at any time to determine the assets and liabilities with the same counterparty that are subject to the netting agreement;
  - (c) the bank monitors and controls roll-off risks; and

(d) the bank monitors and controls the relevant exposures on a net basis<sup>587</sup>.

6.3.27 On-balance sheet netting is treated as a collateralised transaction with loans classified as exposures and deposit as liabilities<sup>588</sup>. No haircuts are made except where a currency mismatch exists<sup>589</sup> with the result that capital will be required against the net exposure only.

#### *Guarantees and credit derivatives*

6.3.28 Guarantees (which include insurance<sup>590</sup>) and credit derivatives are recognised under Basel III as techniques that reduce a bank's credit risk. Basel III sets out certain requirements that are common to both guarantees and credit derivatives, and also specified operational requirements. Only protection provided by guarantors and credit protection sellers with a lower risk weight than the underlying counterparty lead to capital reductions<sup>591</sup>. The effect of a bank purchasing eligible credit protection is to substitute the risk weight applicable to the guarantor/protection provider for that of the counterparty for the covered exposures<sup>592</sup>.

6.3.29 Guarantees and credit derivatives are only recognised if provided by:

(a) sovereigns<sup>593</sup>, public sector entities, multi-lateral development banks, banks, securities firms and other prudentially regulated financial institutions<sup>594</sup> (such as insurance companies) with a lower risk weight than the counterparty;

(b) (in jurisdictions allowing the use of external ratings) other entities with a better external risk weighting than the counterparty. For securitisation exposures, the credit protection provider must additionally have been rated A- or better when the credit protection contract was provided and still be rated BBB- or better;

(c) (in jurisdictions that do not allow the use of external ratings) the guarantor/credit risk provider is treated as "investment grade" and (for corporates) has securities outstanding on a recognised securities exchange<sup>595</sup>.

6.3.30 Sovereign (or central bank) guarantees denominated in the domestic currency may attract a lower risk weight (at national discretion) provided that the guaranteed exposure is denominated in that currency<sup>596</sup>.

6.3.31 Sovereign counter-guarantees (i.e. where the sovereign guarantees payment by a third party guarantor) may be treated as sovereign guarantees if the counter-guarantee covers all credit risk elements of the exposure, both the initial guarantee and the counter-guarantee meet all operational requirements and the relevant national supervisor is satisfied that the cover is robust and the counter-guarantee is effectively equivalent to a direct sovereign guarantee<sup>597</sup>.

6.3.32 Parental and other group company guarantees are recognised for regulatory capital purposes subject to the rules above. Where external ratings are not permitted to be used, intra-group protection must not be positively correlated



with the credit risk of the exposures for which credit protection is provided<sup>598</sup>, and the credit risk of the whole group must be taken into account<sup>599</sup>.

- 6.3.33 The following general requirements apply to both guarantees and credit derivatives:
- (a) the guarantee/credit derivative must represent a direct claim on the protection provider;
  - (b) the credit protection is explicitly referenced to specific exposures or a pool of exposures so the extent of cover is clearly defined and incontrovertible;
  - (c) other than non-payment by the protection purchaser, it must be irrevocable;
  - (d) there is no clause in the contract permitting the guarantor/seller of credit protection to unilaterally cancel the cover, change the maturity of cover or to increase the effective cost of cover as a result of a deterioration in the credit quality of the hedged exposure;
  - (e) there is no clause in the protection contract outside of the bank's direct control that could prevent the protection provider being obliged to pay in a timely manner if the underlying counterparty defaults; and
  - (f) payment is unconditional<sup>600</sup>.

#### *Guarantees*

- 6.3.34 In respect of guarantees, Basel III sets out four specific requirements. Firstly, on default/non-payment the bank must have the right to pursue the guarantor in a timely way without having to bring legal action against the obligor first<sup>601</sup>. Secondly, the guarantee must be an explicitly documented obligation assumed by the guarantor. Thirdly, the guarantee must cover all types of payments that the underlying counterparty is expected to make under the documentation governing the transaction. Finally, if the guarantee covers principal only, interest and other uncovered payments must be treated as an unsecured amount<sup>602</sup>.

#### *Credit derivatives*

- 6.3.35 Only credit default swaps and total return swaps that provide credit protection equivalent to guarantees<sup>603</sup> are eligible. An exception to eligibility exists where a bank buys credit protection through a total return swap and records the net payments under the swap as income but does not record offsetting deterioration in the value of the asset that is protected which are not recognised as being eligible<sup>604</sup>. This is because there can be no certainty as to the value of the protection purchased.
- 6.3.36 Basel III also specifies minimum credit events for a credit derivative to be eligible. These include:

- (a) a failure to pay the amounts due (with any grace period being in line with that of the underlying obligation);
  - (b) bankruptcy, insolvency or inability to pay its debts; and
  - (c) restructuring of the underlying obligation involving forgiveness or postponement of principal, interest or fees that results in a credit loss event<sup>605</sup>.
- 6.3.37 If restructuring is not covered by the credit derivative, partial recognition is allowed. If the amount of credit protection is less than or equal to the underlying exposure then 60% of the exposure will be treated as hedged. If the credit protection exceeds the exposure, the hedge is capped at 60%<sup>606</sup>.
- 6.3.38 The credit derivative must not terminate before the expiry of any grace period required for default on the underlying obligation<sup>607</sup>. If the credit derivative requires physical settlement (i.e. transfer of the reference obligation to the protection seller for settlement) then the terms of the underlying obligation must provide that any required consent to transfer may not be unreasonably withheld<sup>608</sup>. If the credit derivative provides for cash settlement then there must be a robust valuation process in place (including a specified period for obtaining post-credit event valuations) to determine the amount of loss<sup>609</sup>. Further, the party responsible for determining whether a credit event has occurred must be clearly defined, and it cannot be the sole responsibility of the protection seller i.e. the protection buyer must have the right/ability to inform the protection seller (or any determinations committee<sup>610</sup>) of the occurrence of a credit event<sup>611</sup>.
- 6.3.39 There are also specific requirements in respect of asset mismatches (i.e. a mismatch between the underlying obligation and the reference obligation under the credit derivative). Generally, the reference obligation must rank *pari passu* to or be junior to the underlying obligation<sup>612</sup>.

#### *Capital treatment*

- 6.3.40 Where an exposure is guaranteed, or is covered by a credit derivative, the capital charge in respect of the part of the exposure covered by the credit derivative or guarantee is assigned the risk weight of the protection provider. Any materiality thresholds on payment are treated as first loss positions and are assigned a risk weight of 1250% by the bank purchasing the credit protection<sup>613</sup> (i.e. are treated as effectively deducted from capital).
- 6.3.41 Where losses are shared on a *pro rata* basis between the bank and the guarantor, capital relief is recognised on a proportional basis, meaning that the protected portion receives the treatment applicable to the protection provider, whilst the rest of the exposure is treated as unsecured<sup>614</sup>.
- 6.3.42 Tranched protection (i.e. where a bank transfers a portion of the credit risk to a protection provider and the risk retained and transferred are of different seniority) is subject to the securitisation approach<sup>615</sup>.
- 6.3.43 First-to-default and nth-to-default credit derivatives are not recognised for regulatory purposes as a risk mitigant<sup>616</sup>. These are contracts providing credit

protection on a basket of reference entities where the first or nth to default leads to a payment by the protection seller and the termination of the contract. The absence of capital relief is a reflection of the fact that such transactions provide no determinable credit protection against individual exposures.

- 6.3.44 Currency mismatches give rise to a haircut on the protection provided<sup>617</sup>.

#### *Maturity mismatches*

- 6.3.45 Basel III has specific rules in respect of maturity mismatches (i.e. when residual maturity of the credit protection is less than that of the underlying exposure)<sup>618</sup>. In determining whether an exposure is mismatched, a bank is required to apply a “worst case” scenario comparing the longest possible scheduled maturity of the underlying exposure (taking into account any applicable grace period) with the earliest possible effective maturity of the hedge (including embedded options or calls that enable the seller to terminate the cover, or contain a positive incentive for the bank to exercise a call e.g. step-ups)<sup>619</sup>.
- 6.3.46 For financial collateral, any maturity mismatch will not be allowed if the bank uses the simple approach to collateral<sup>620</sup>. In other words, if the duration of the hedge is less than that of the exposure, the exposure is treated as uncollateralised.
- 6.3.47 For banks that use other approaches to financial collateral, partial recognition is given to maturity mismatches. The original maturity of the hedge must originally have been one year or more, and the residual maturity must equal or exceed three months<sup>621</sup>. If either of these conditions is not met the exposure is regarded as unhedged. Where they exist then a simple formula determines the amount of protection that may be recognised<sup>622</sup>.

#### *Pools of credit risk mitigation techniques*

- 6.3.48 Where a bank has multiple credit risk mitigation techniques covering a single exposure (e.g. a bank takes both collateral and a guarantee), it is required to subdivide the exposure into notional portions covered by each type of credit risk mitigant (e.g. the part covered by a guarantee, the part covered by collateral). The risk weight is then calculated separately for each notional part of the exposure so covered<sup>623</sup>.
- 6.3.49 If credit protection is provided by a single entity, but with different maturities, the bank must also subdivide the exposure into separate parts<sup>624</sup>.

## **6.4 Credit Risk Mitigation under IRB**

- 6.4.1 For banks that apply the foundation IRB approach the rules on credit risk mitigation follow closely those applicable under the standardised approach. However, there are two significant differences. Firstly, the effect of credit risk mitigation techniques is on the IRB risk components as opposed to on risk weighted assets directly, as under the standardised approach. The second difference with the standardised approach is that a wider range of credit risk mitigation techniques is allowed. However, the range of techniques is

narrower than that available under the advanced IRB approach (where available).

- 6.4.2 Under both the foundation and the advanced IRB approaches, the effect of a bank holding collateral is to reduce the loss given default (LGD) as the bank is able to resort to the collateral if its counterparty defaults, thus reducing the amount of its loss. Guarantees and credit derivatives are treated as reducing the probability of default (PD) through reducing the probability that a bank will suffer loss as it has a claim on the protection provider as well as on the obligor in the event of a default or the loss given default (LGD) of the transaction with the LGD applicable to the guarantee. On-balance sheet netting is treated as reducing a bank's exposure at default (EAD) as it reduces the extent to which the bank is exposed on the default of a counterparty.
- 6.4.3 Under the foundation IRB approach the minimum standards that a bank must meet are generally the same as those for the standardised approach. Thus the bank will need to satisfy the requirements of legal certainty, low correlation with the exposure and robust internal risk management. Banks on the foundation IRB approach may use any of the forms of credit risk mitigation available under the standardised approach. In addition, banks are allowed to use additional assets as collateral.

#### *Collateral under the foundation IRB approach*

- 6.4.4 Banks using the foundation IRB approach are able to use both financial collateral and eligible IRB collateral. Financial collateral is any collateral eligible under the standardised approach (see above). Eligible IRB collateral consists of real estate, specified receivables and other physical collateral meeting specified minimum requirements<sup>625</sup>.

#### *Financial collateral*

- 6.4.5 The treatment of financial collateral closely follows that applicable under the comprehensive approach to collateral for banks on the standardised approach. Banks that use an IRB approach are not able to apply the simple approach to collateral<sup>626</sup>. Under Basel III, a bank is required to calculate the adjusted value of the collateral through applying haircuts to the gross value of the collateral<sup>627</sup>.

#### *Financial receivables*

- 6.4.6 Financial receivables are eligible as collateral provided that they have an original maturity of one year or less and repayment occurs through commercial or financial flows related to the underlying assets of the borrower. Receivables associated with securitisations, sub-participations and credit derivatives are expressly excluded<sup>628</sup>. Banks must have an enforceable security interest over the receivables<sup>629</sup> and the bank must have a sound process for determining credit risk in the receivables<sup>630</sup>.

#### *Commercial and residential real estate*

- 6.4.7 Commercial and residential real estate is eligible as collateral for IRB banks provided that:

- (a) repayment of the secured loan by the borrower is dependent not on the performance of the underlying property or project, but rather on the underlying capacity of the borrower to repay the debt from other sources; and
  - (b) the value of the collateral is not materially dependent on the performance of the borrower<sup>631</sup>.
- 6.4.8 Income producing real estate that falls within the specialised lending sub-class of corporate exposures is specifically excluded<sup>632</sup>. *A fortiori* this applies to high-velocity commercial real estate.
- 6.4.9 In exceptional circumstances, for well-developed and long-established markets, secured commercial real estate lending may be treated as collateral in the corporate exposure portfolio. Two tests must be fulfilled: (i) losses stemming from commercial real estate lending up to 50% of the market value or 60% of the LTV must not exceed 0.3% of the outstanding loans in any given year; and (ii) overall losses stemming from commercial real estate lending must not exceed 0.5% of the outstanding loans in any given year<sup>633</sup>.
- 6.4.10 Commercial and residential real estate is eligible for recognition as collateral only if:
  - (a) any collateral taken is legally enforceable in all relevant jurisdictions, and the bank perfects its security interest in accordance with applicable law;
  - (b) the collateral must be valued at or less than the current fair value under which the property could be sold to an arms' length purchaser;
  - (c) the bank monitors the value of the collateral on a frequent basis and at a minimum once per year; and
  - (d) (in the case of second and subsequent mortgages) there is no doubt that the security interest is legally enforceable and constitutes an effective credit risk mitigant<sup>634</sup>.
- 6.4.11 Collateral management requirements are as follows:
  - (a) the types of commercial and residential real estate collateral accepted by the bank, and its lending policies, are clearly documented;
  - (b) the bank takes steps to ensure that the property is adequately insured;
  - (c) the bank monitors on an ongoing basis the extent of any prior claims on the property (e.g. tax); and
  - (d) the bank appropriately monitors the risk of environmental liability, such as presence of toxic waste<sup>635</sup>.

*Other physical collateral*

- 6.4.12 National supervisors may allow the recognition in their jurisdictions of certain other physical collateral if:
- (a) the bank demonstrates that there are liquid markets for disposal of the collateral in an expeditious and economically efficient manner; and
  - (b) there are well established, publicly available market prices for the collateral<sup>636</sup>.
- 6.4.13 Examples could be aircraft, ships, cars, traded commodities and raw materials.
- 6.4.14 The following requirements apply:
- (a) the bank has a first mortgage over the collateral;
  - (b) the loan agreement includes detailed descriptions of the collateral and the right to examine and revalue the collateral;
  - (c) the types of physical collateral accepted by the bank, and policies and practices in respect of the appropriate amount of each type of collateral, are clearly documented;
  - (d) bank credit policies address appropriate collateral requirements, the ability to liquidate the collateral, to establish a price or market value, and the volatility of the value of the collateral; and
  - (e) in case of inventories (e.g. raw materials, work-in-process, finished goods or dealers' inventories of cars) and equipment, the periodic revaluation process includes physical inspection of the collateral<sup>637</sup>.
- 6.4.15 Basel III does not continue the approach under Basel II of requiring a "meaningful" amount of collateral to be taken. Instead, a formula applies<sup>638</sup>. However, the distinction may be more apparent than real given the application of haircuts to all collateral limiting the ability of such collateral to reduce the exposure amount. Nonetheless, there is no current requirement to hold a minimum amount of collateral.
- 6.4.16 For each collateralised exposure the bank determines the amount that is considered to be fully collateralised. The LGD of a collateralised exposure is the exposure-weighted average of the LGD applicable to the unsecured part of an exposure under a formula<sup>639</sup>.
- 6.4.17 The following table applies<sup>640</sup>.

Type of collateral	LGD for the collateralised part of the exposure	Haircut
Financial collateral	0%	As determined in accordance with the comprehensive

Type of collateral	LGD for the collateralised part of the exposure	Haircut
		approach to collateral under the standardised approach
Eligible receivables	20%	40%
Eligible commercial and residential real estate	20%	40%
Other eligible physical collateral	25%	40%
Ineligible collateral	N/A	100% (i.e. no recognition)

- 6.4.18 In cases of a currency mismatch the haircut for each currency is that applicable under the standardised approach<sup>641</sup>.
- 6.4.19 If an exposure is secured by a pool of collateral that includes both financial collateral and other eligible IRB collateral then the exposure is notionally split up into a part secured by financial collateral and the remainder secured by other form(s) of eligible IRB collateral (receivables, real estate, other collateral). The part secured by eligible IRB collateral is then subject to the above treatment<sup>642</sup>.

## 6.5 Other Credit Risk Mitigation Techniques under the Foundation IRB Approach

- 6.5.1 On-balance sheet netting reduces a bank's exposure at default (EAD). The requirements for on-balance sheet netting under the foundation IRB approach are identical to those under the standardised approach<sup>643</sup>.
- 6.5.2 In respect of guarantees and credit derivatives, the foundation IRB approach closely follows the standardised approach. The minimum conditions and operational requirements are identical<sup>644</sup>. Credit protection is recognised from the same entities (sovereigns, public sector entities, banks and corporates) except that unrated companies that are internally rated are also eligible as credit protection providers<sup>645</sup>. The bank then assigns to the guaranteed exposure the PD grade of an exposure to the guarantor<sup>646</sup>. It then uses this PD grade to calculate the risk weight of the exposure using the risk weight function appropriate to the guarantor (sovereign, bank or corporate as the case may be)<sup>647</sup>.
- 6.5.3 As an alternative, banks may, instead of modifying the PD, use the LGD of the guarantee (as opposed to the LGD of the underlying transaction), taking into account the seniority of the guarantee and any collateral provided to support the guarantee<sup>648</sup>.
- 6.5.4 Any uncovered portion of the exposure is assigned the risk weight appropriate to the underlying counterparty<sup>649</sup>. Currency mismatches and partial coverage are treated in the same way as under the standardised approach<sup>650</sup>.

*Maturity mismatches*

6.5.5 The treatment of maturity mismatches is the same as that under the standardised approach<sup>651</sup>. Mismatched hedges with a residual maturity of less than one year are not recognised. Hedges of over one year receive proportional recognition.

**6.6 Credit Risk Mitigation under Advanced IRB**

6.6.1 Under the advanced IRB approach for eligible portfolios banks directly estimate the probability of default (PD), the loss given default (LGD) and the exposure at default (EAD) of their exposures. In calculating PD, LGD and EAD banks are generally permitted to use their own internal estimates of the effect of credit risk mitigation techniques. As the advanced IRB approach provides much greater risk sensitivity, through assessing the effect of such arrangements on each of the drivers of credit risk, a greater range of credit risk mitigants is recognised.

6.6.2 The effect of collateral being provided is to reduce the loss given default. Banks must therefore be able to calculate both the LGD and EAD. Banks unable to do so may not use the advanced IRB approach<sup>652</sup>. Where they can the advanced IRB approach may be used.

6.6.3 The following floors apply to banks' internal calculation of the effect of fully collateralised corporate exposures under Basel III<sup>653</sup>. They do not apply to the sovereign asset class<sup>654</sup> and banks may not use the advanced IRB approach for bank exposures, or any IRB approach to equity exposures. A separate set of rules is applicable to retail transactions. The effect of the floor is to prevent a bank from applying a lower LGD to fully collateralised transactions than that set out below<sup>655</sup>.

LGD floors for corporate exposures		
Unsecured	Secured	
25%	Financial collateral	0%
	Receivables	10%
	Commercial or residential real estate	10%
	Other physical collateral	15%

6.6.4 Where an exposure is partially collateralised, then a formula determines the floor based on a weighted average of the unsecured LGD floor and the LDG floor for the collateralised corporate exposure<sup>656</sup>.

6.6.5 If a bank is able to use own estimates of LGD for a given pool of exposures, and takes collateral against one of these exposures, but is unable to model the effects of the collateral, it may apply the foundation IRB formula provided that the collateral is eligible under the foundation IRB approach<sup>657</sup>.

6.6.6 Subject to meeting specified minimum standards, there are no specific restrictions on the types of collateral (including real estate) that a bank may



use for regulatory capital purposes, or on the range of providers of guarantees or credit derivatives. In particular, banks are not required to follow the “haircuts” approach to financial collateral. Instead, the focus is on ensuring that the bank’s internal figures are reliable<sup>658</sup>.

- 6.6.7 Where collateral is recognised, banks must establish internal requirements for collateral management, operational procedures, legal certainty and risk management processes that are generally consistent with those under the foundation IRB approach<sup>659</sup>.
- 6.6.8 The treatment of on-balance sheet netting is the same as under the foundation IRB approach (although banks will need directly to estimate the effect of netting in reducing the exposure at default for each facility)<sup>660</sup>.
- 6.6.9 In respect of guarantees and credit derivatives, banks must assess directly the effect of the guarantee or credit derivative in reducing the probability of default of the borrower through a reduction in the PD or LGD figures<sup>661</sup>. This requires banks to assign an internal grade to both the borrower and to the guarantor. As stated above, there is no restriction on the identity of guarantors, although the set of minimum requirements must be satisfied<sup>662</sup>. Further, banks applying the advanced IRB approach may recognise guarantees that only cover loss remaining after the bank has first pursued the original obligor and has completed the workout process<sup>663</sup>. Banks apply their own estimates as to the extent of risk transfer. No recognition is given to the “double default” effect of guarantees and credit derivatives (i.e. the fact that a bank will only suffer loss if *both* the underlying obligor *and* the protection provider default)<sup>664</sup>.
- 6.6.10 Banks are permitted under the advanced IRB approach to adjust the LGD grade. There are two alternatives. The first is based on the foundation IRB approach and involves the bank replacing the LGD of the underlying transaction with the LGD applicable to the guarantee. The second option involves the bank making an adjustment to its own LGD estimate of the exposure to reflect the presence of the guarantee or credit derivative<sup>665</sup>. In this case, there is no limit on the range of eligible guarantors<sup>666</sup>. First-to-default, but not other nth-to-default, credit derivatives may be recognised under the advanced IRB approach<sup>667</sup>.

## 6.7 Credit Risk Mitigation for Retail Exposures

- 6.7.1 There is no foundation IRB approach for retail exposures. Banks are therefore required to provide their own internal estimates of the effect of credit risk mitigation in determining both the probability of default and the loss given default. As has been mentioned, there are floors for both PD and LGD estimates<sup>668</sup>. The risk-reducing effect of guarantees and credit derivatives is effected either through an adjustment to the PD or the LGD estimate<sup>669</sup>, although adjustments must be done in a consistent manner<sup>670</sup>. Netting is recognised subject to the same conditions as under the standardised approach<sup>671</sup>.

## 6.8 Purchased Receivables

- 6.8.1 Credit risk mitigation in the form of guarantees and credit derivatives is recognised in the same way as under the foundation or advanced IRB approach. In particular, guarantees provided by the seller covering either default risk, dilution risk, or both are recognised<sup>672</sup>. The following treatment applies. If the guarantee covers both default risk and dilution risk then the bank should substitute the risk weight of the exposure for that of the guarantor. If it covers only one of these elements, then the substitution approach applies to that capital charge, and the normal charge for the other is added<sup>673</sup>. Proportional and tranching cover is addressed in the same way as under the normal IRB approach<sup>674</sup>. At national discretion, unrated guarantors internally rated and associated with a PD equivalent to A- may be recognised under the foundation IRB approach<sup>675</sup>. This seems an anomalous survival of the Basel II IRB approach which has not been carried forward elsewhere in the Basel III text for guarantors and providers of credit protection.

## 7. SECURITISATION

Securitisation was at the heart of the global financial crisis and it was therefore inevitable that it would see urgent reform in its aftermath. The process for developing a new capital framework for securitisations was begun soon after the crisis with the so-called Basel 2.5 package of reforms, while the Committee decided how to replace the Basel II securitisation framework. The new framework came into force in 2018, although further refinements apply from 1 January 2023. This reflects the iterative process followed by the Basel Committee in first addressing, on an interim basis, certain clear failings in the Basel II securitisation framework, whilst then developing and refining a new standard under Basel III. This chapter accordingly describes the fully developed securitisation framework applicable from 2023, without considering intermediate approaches. Given that the Basel III framework bears little comparison with the Basel II approach, only limited discussion of changes will be given.

The securitisation standard differentiates between so-called simple, transparent and comparable (STC) securitisations, and other securitisations when applying risk weights. Non-STC securitisations are further divided into ordinary securitisations and re-securitisations, the latter being a securitisation of a pool of assets, at least one of which is itself a securitisation. Securitisations of securitisations (such as the now notorious collateralised debt obligations, or CDOs) were involved in a significant part of the losses suffered by banks in the global financial crisis.

### 7.1 Introduction

7.1.1 Companies and banks may securitise assets for a variety of purposes. These include reducing their regulatory capital requirements through transferring assets off their regulatory balance sheet, obtaining additional funding, improving financial ratios, managing portfolio risk and diversifying their portfolio.

7.1.2 Banks may become involved in a securitisation at different stages of the process. Firstly, the bank may act as an originator. In this case, the bank transfers assets off its own balance sheet to a SPV (traditional securitisation) or purchases eligible credit protection (synthetic securitisation). Additionally, an originator may provide credit enhancements or liquidity facilities to the SPV. Secondly, a bank may be an investor in the securitisation by purchasing asset-backed securities or credit-linked notes issued by the SPV. Thirdly, a bank may act as sponsor. In this case the bank may provide credit enhancements and/or liquidity facilities to the SPV. The bank may also assist in marketing the securities to investors. Fourthly, a bank may be a servicer if it manages the underlying credit exposures of a securitisation on a day-to-day basis through collecting principal and interest and paying it to investors. These categories are not mutually exclusive and a bank may, for example, act as both an originator and a servicer.

### 7.2 Background

7.2.1 The December 2012 consultative document published by the Basel Committee identified the following deficiencies in the Basel II framework:

- (a) mechanistic reliance on external ratings;
- (b) too low risk weights for highly-rated securitisations;
- (c) too high risk weights for low-rated securitisations; and
- (d) cliff-effects in capital requirements following a deterioration in credit quality of the underlying pool<sup>676</sup>.

7.2.2 Basel III is based on a pre-defined hierarchy of methods. At the top of the pyramid is the securitisation internal ratings-based approach, that a bank must use if able. If not, there is a securitisation external ratings-based approach that must be used by banks in jurisdictions that permit the use of external ratings. Below this is the securitisation standardised approach.

7.2.3 This chapter will firstly set out the differences between STC securitisations, other securitisations and re-securitisations. The second category is residual in that it encompasses any securitisation that is neither an STC securitisation nor a re-securitisation. Then it will describe the standardised approach, the external ratings-based approach and the internal ratings-based approach. This is for ease of understanding. However, it must be stressed that the actual hierarchy under Basel III is the opposite, so a bank that can use either the internal ratings-based approach or the external ratings-based approach must use those approaches in preference to the standardised approach<sup>677</sup>. Any securitisation exposure to which a bank cannot apply any of the foregoing approaches is assigned a 1250% risk weighting (equivalent to a deduction from capital)<sup>678</sup>.

### 7.3 Types of Securitisations

7.3.1 There are three types of securitisations under the Basel III framework: STC securitisations, re-securitisations and other securitisations. Both re-securitisations and other securitisations may take the form of either a traditional securitisation or a synthetic securitisation (synthetic securitisations are expressly excluded from the definition of an STC securitisation).

7.3.2 Banks must use the securitisation framework for determining regulatory capital requirements on exposures arising from all securitisations, as well as other tranching exposures. As securitisations may be structured in different ways, Basel III requires the capital treatment to be determined based on its economic substance and not legal form. Banks that are in doubt whether a particular transaction is a securitisation are encouraged to consult with their national supervisors<sup>679</sup>.

7.3.3 Securitisation exposures can include asset-backed securities, mortgage-backed securities, credit enhancements, liquidity facilities, interest rate or currency swaps, credit derivatives and tranching cover. Reserve accounts, such as cash collateral accounts, recorded as an asset by the originating bank must also be treated as securitisation exposures<sup>680</sup>.

### *Traditional securitisations*

7.3.4 A traditional securitisation is a structure where the cash flow from an underlying pool of exposures is used to service at least two different stratified risk positions or tranches reflecting different degrees of credit risk. Payments to the investors depend upon the performance of the specified underlying exposures. The tranching structure that characterises traditional securitisations differs from ordinary senior/subordinated debt instruments in that junior tranches absorb losses without interrupting contractual payments to more senior tranches, whereas subordination is only applicable in a winding up<sup>681</sup>.

### *Synthetic securitisations*

7.3.5 A synthetic securitisation is a structure with at least two different stratified risk tranches that reflect different degrees of credit risk where the credit risk of an underlying pool of exposures is transferred, in whole or in part, through the use of funded (e.g. credit-linked notes) or unfunded (e.g. credit default swaps) credit derivatives or guarantees that hedge the credit risk on the portfolio<sup>682</sup>.

### *Re-securitisations*

7.3.6 A re-securitisation is a securitisation exposure in which the risk associated with an underlying pool of exposures is tranching and at least one of the underlying exposures is itself a securitisation exposure. In addition, an exposure to one or more re-securitisation exposures is also a re-securitisation exposure. However, the re-tranching of a securitisation exposure does not make the exposure into a re-securitisation exposure if the bank is able to demonstrate that the cash flows to and from the bank could be replicated in all circumstances by an exposure to the securitisation of a pool of assets that contains no securitisation exposures<sup>683</sup>.

## 7.4 Definitions

7.4.1 The following definitions apply under the Basel III framework:

- (a) An **originator** is a bank if it acts in one of the following two ways:
  - (i) it originates, directly or indirectly, underlying exposures included in the securitisation; or
  - (ii) it is the sponsor of an asset-backed commercial paper (ABCP) conduit or similar programme that acquires exposures from third party entities. A bank is treated as a sponsor if it manages or advises the programme, places securities into the market, or provides liquidity facilities or credit enhancements<sup>684</sup>.
- (b) An ABCP programme predominantly issues commercial paper to third-party investors with an original maturity of one year or less, and is backed by assets or other exposures held in a bankruptcy-remote, special-purpose entity<sup>685</sup>.

- (c) A **credit enhancement** is a contractual arrangement in which the bank or other entity retains or assumes a securitisation exposure and, in substance, provides some degree of added protection to other parties to the transaction<sup>686</sup>.
- (d) A **credit-enhancing interest-only strip (I/O)** is an on-balance sheet asset that represents a valuation of cash flows related to future margin income and is subordinated<sup>687</sup>.
- (e) A **liquidity facility** is undefined in the Basel III framework. The Basel II definition was, basically, an arrangement under which a bank provided short term liquidity to an SPV to facilitate the payment of interest to investors. This corresponds with market practice and would seem to continue to apply under Basel III. However, it should be stressed, that the beneficial treatment of certain liquidity facilities under Basel II has been withdrawn.
- (f) A **clean-up call** is an option that permits the securitisation exposures to be called before all of the underlying exposures, or securitisation exposures, have been repaid. In the case of traditional securitisations, this is generally accomplished by repurchasing the remaining exposures once the pool balance or outstanding securities have fallen below a specified level. For synthetic securitisations it can take the form of a clause that extinguishes the credit protection<sup>688</sup>.
- (g) An **early amortisation provision** is a mechanism that, once triggered, accelerates the reduction of the investor's interest in the underlying exposures of a securitisation of revolving credit facilities, and allows investors to be paid out prior to the original maturity of the securities issued<sup>689</sup>.
- (h) A securitisation of **revolving credit facilities** is a securitisation in which one or more underlying exposures represents, directly or indirectly, current or future drawings on revolving credit facilities. Examples include securitisations of credit cards, home equity lines of credit, commercial lines of credit and other lines of credit<sup>690</sup>.
- (i) The **express spread** (or future margin income) is defined as gross finance charge collections and other income received by the SPV less interest, servicing fees, charge-offs and other senior expenses<sup>691</sup>.
- (j) **Implicit support** arises when a bank provides support to a securitisation in excess of its predetermined contractual obligation<sup>692</sup>. Common examples include repurchasing exposures from the pool above current market value to protect investors in the securities from losses, or providing additional credit support after the inception of the securitisation.
- (k) A tranche is considered to be **senior** if it is effectively backed or secured by a first claim on the entire amount of the assets in the underlying securitised pool. While this generally includes only the most senior position within a securitisation transaction, in some instances there may be other claims that are senior in the waterfall e.g. a claim under a swap.

Where several tranches have different maturities, but share pro rata loss allocation without affecting their seniority, then they may be treated as being of the same seniority<sup>693</sup>. While these clarifications are welcome, the effect is that in any securitisation, only the most senior tranche (which may be an unrated super-senior tranche) will count as being senior with all other tranches regarded as subordinated.

7.4.2 Basel III provides the following illustrations of this:

- (a) in a traditional securitisation with all tranches above the first loss piece being rated, only the most highly rated position qualifies as the senior tranche<sup>694</sup>;
- (b) in a synthetic securitisation, an unrated tranche is treated as the senior tranche provided that all the conditions for inferring a rating from a lower tranche that meets the definition of a senior tranche are met<sup>695</sup>; and
- (c) a liquidity facility supporting an ABCP programme is treated as senior if it covers all losses on the underlying receivables pool that exceed the amount of overcollateralisation/reserves provided by the seller if it is sized to cover all of the outstanding commercial paper and other senior debt supported by the pool, so that no cash flows from the underlying pool could be transferred to the other creditors until any liquidity facilities were repaid in full<sup>696</sup>.

#### *Exposures*

7.4.3 Basel III applies capital charges to exposures. In calculating the size of an exposure banks must determine the sum of the on-balance sheet exposure, or carrying value, taking into account purchase discounts, write-downs, specific provisions and the off-balance sheet exposure (if relevant)<sup>697</sup>.

7.4.4 Off-balance sheet exposures are determined as follows:

- (a) for credit risk mitigants sold or purchased by a bank the treatment is as for credit risk mitigation (see below)<sup>698</sup>;
- (b) other facilities are subject to a 100% credit conversion factor;
- (c) in the case of servicer cash advances, the undrawn portion that is unconditionally cancellable without prior notice receives the credit conversion factor for unconditionally cancellable facilities under the standardised approach<sup>699</sup>. This is 10%<sup>700</sup>.

7.4.5 An SPV (the actual term used in the Basel III text is an SPE or special purpose entity) is a corporation, trust or other entity organised for a specific purpose, the activities of which are limited to those appropriate to accomplish the purpose of the SPV, and the structure of which is intended to isolate the SPV from the credit risk of an originator or seller of exposures<sup>701</sup> i.e. it is bankruptcy remote.

7.4.6 **Maturity** is the tranche's remaining effective maturity in years. Basel III allows banks to measure maturity in either of the following two ways, with a floor of one year and a cap of five years<sup>702</sup>:

- (a) the weighted average<sup>703</sup> of the contractual cash flows of the tranche calculated as follows:

$$M_T = \frac{\sum_t t \cdot CF_t}{\sum_t CF_t}$$

Where  $M_t$  is the maturity of the tranche and  $CF_t$  denotes the cash flows (principal, interest and fees) payable by the borrower in period  $t$ . Where unconditional conditional payment dates are unavailable the final legal maturity must be used<sup>704</sup>; or

- (b) on the basis of the final legal maturity of the tranche:

$$M_T = 1 + 80\% (M_L - 1)$$

where  $M_L$  is the final legal maturity of the tranche<sup>705</sup>.

7.4.7 When determining the maturity of a securitisation exposure, banks should take into account the maximum period of time they are exposed to potential losses from the securitised assets. Where a bank provides a commitment, the bank should calculate the maturity of the exposure as the sum of the contractual maturity of the commitment and the longest maturity of the assets that might be added during the revolving period, as opposed to that of the assets currently in the pool<sup>706</sup> (i.e. in a worst case scenario).

7.4.8 The same treatment applies to other instruments where the risk of the commitment/protection provider is not limited to losses realised until the maturity of the instrument (e.g. total return swaps)<sup>707</sup>. Credit protection only exposed to losses occurring up to the maturity of the instrument can be limited to the maturity of the contractual instrument without regard to the maturity of the protected position<sup>708</sup>.

## 7.5 Operational requirements for the recognition of a securitisation

7.5.1 The requirements differ depending on whether the securitisation is a traditional or a synthetic securitisation.

7.5.2 An originator (including persons treated as an originator under the securitisation framework) must satisfy all of the following in order for the securitisation to be recognised for regulatory capital purposes as a **traditional securitisation**:

- (a) significant credit risk is transferred to third parties (the amount of which is undefined, unlike in EU law);
- (b) the transferor does not maintain effective or indirect control over the transferred exposures. A bank is deemed to have retained effective control if:



- (i) it is able to repurchase previously transferred exposures in order to realise their benefits; or
- (ii) it is required to retain the risk of transferred exposures;
- (c) the exposures are legally isolated from the transferor in a way that puts the exposures beyond the reach of the transferor and its creditors. Basel III refers to both a sale of the assets and a sub-participation, although under English law a sub-participation only transfers the economic interest and provides no protection in the event of the transferor's insolvency. For this reason, securitisations are not commonly structured in England as a sub-participation;
- (d) the bank obtains a legal opinion confirming a true sale. Under Basel III this can be either an external legal opinion, or written advice from an in-house lawyer;
- (e) the securities are not obligations of the transferor;
- (f) the transferee is an SPV and the holders of the beneficial interests in the SPV have the right to pledge or exchange those interests without restriction (save in the case of mandatory risk retention requirements). In England, an SPV is commonly a bankruptcy-remote entity, separate from the originating bank, but not owned by the holders of the securities who have a proprietary interest instead in the transferred pool of exposures (e.g. it may be owned by a charitable trust);
- (g) any clean-up calls meet specified criteria (see below);
- (h) there are no clauses in the securitisation documentation that:
  - (i) require the originating bank to alter the pool of underlying exposures to improve the credit quality of the pool;
  - (ii) allow for increases in any retained first loss position or credit enhancements provided by the originating bank after the inception of the securitisation; or
  - (iii) increase the yield payable to other parties (such as investors in the securities sold, or third party providers of credit enhancements) in response to a deterioration in the credit quality of the pool of exposures.

(All of these constitute implicit support prohibited under Basel III); and

- (i) there are no termination options or triggers except permitted clean-up calls, tax or regulatory calls, or permitted early amortisation provisions<sup>709</sup>.

### 7.5.3 The requirements for a **synthetic securitisation** are the following:

- (a) the credit protection satisfies the requirements for a credit derivative or a guarantee under the standardised approach to credit risk mitigation

- (unfunded credit protection) or collateral (funded credit protection, such as credit-linked notes);
- (b) eligible providers of credit protection are limited to those recognised under the standardised approach i.e. sovereigns, public sector entities, multi-lateral development banks, banks, securities firms, other prudentially regulated firms, corporates meeting certain criteria, and other group companies;
  - (c) collateral is limited to that recognised under the simple approach to collateral (including such collateral if provided by the SPV);
  - (d) significant credit risk (which is undefined) is transferred to third parties;
  - (e) the securitisation documentation contains no clauses that limit the amount of credit risk transferred, such as any of the following (the list is non-exhaustive):
    - (i) clauses that materially limit the credit protection or credit risk transferred. Basel III gives the following examples:
      - (A) early amortisation provisions that effectively subordinate the bank's interest;
      - (B) significant materiality thresholds below which the credit protection cannot be triggered if a credit event occurs; or
      - (C) clauses that allow for the termination of the credit protection if the credit quality of the pool of exposures deteriorates;
    - (ii) clauses that require the originating bank to alter the underlying pool of exposures to improve the pool's credit quality;
    - (iii) clauses that increase the bank's cost of credit protection in response to a deterioration in the credit quality of the pool;
    - (iv) clauses that increase the yield payable to third parties, such as investors or providers of credit enhancements, if the credit quality of the pool deteriorates; or
    - (v) clauses that provide for increases in a retained first-loss position or credit enhancement provided by the originating bank after the inception of the securitisation;
  - (f) the bank obtains a legal opinion that confirms the enforceability of the credit protection contract; and
  - (g) any clean-up calls satisfy the requirements set out below<sup>710</sup>.

*Early amortisation provisions*

- 7.5.4 There are detailed rules to address risks arising out of early amortisation provisions. This is in response to evidence obtained by the Basel Committee that securitisations of revolving exposures with both “controlled” and “uncontrolled” early amortisation provisions (under the Basel II framework) typically result in very limited, if any, transfer of credit risk to investors. Basel III therefore treats certain revolving securitisations with early amortisation provisions as automatically on-balance sheet for regulatory purposes, as well as setting out operational requirements for early amortisation provisions if a securitisation is to be recognised for regulatory capital purposes.
- 7.5.5 A securitisation is automatically deemed to fail to meet the requirements for traditional or synthetic securitisations (and therefore will not be recognised for regulatory purposes) if:
- (a) the securitisation is of one or more revolving credit facilities; and
  - (b) there is an early amortisation or other similar provision which, if triggered, would:
    - (i) subordinate the bank’s senior or *pari passu* interest in the underlying credit facilities to the interests of other investors;
    - (ii) subordinate the bank’s subordinated interest to an even greater degree relative to the interests of other parties; or
    - (iii) in other ways, increase the bank’s exposure to losses associated with the underlying credit facilities<sup>711</sup>.
- (All of these examples involve the provision of credit enhancements to investors).
- 7.5.6 Securitisations that are not specifically excluded by the preceding paragraph, and which meet all the other criteria for a traditional or a synthetic securitisation, may attract regulatory capital relief if they contain an early amortisation provision, and the securitisation falls within one of the following categories:
- (a) replenishment structures where the exposures do not revolve, and early amortisation ends the ability of the bank to add new exposures;
  - (b) securitisation structures of revolving credit facilities containing an early amortisation provision that mimic term structures (i.e. where the risk on the underlying revolving credit facilities does not return to the bank) and where the early amortisation provision does not effectively result in subordination of the originator’s interest;
  - (c) structures where a bank securitises one or more revolving facilities and where investors remain fully exposed to future drawdowns by borrowers after the early amortisation event occurs; or

- (d) the early amortisation provision is triggered solely by events not related to the performance of the underlying assets or the selling bank e.g. a material change in tax law<sup>712</sup>.

7.5.7 In all of these cases the early amortisation provision does not have the economic effect of accelerating the reduction of the investors' interest in the securitised pool allowing investors to be repaid prior to the original maturity of the securities.

#### *Clean-up calls*

7.5.8 A clean-up call is a call option that permits securitisation exposures to be called before all of the underlying exposures or securitisation exposures have been repaid. In a traditional securitisation, this is normally done by repurchasing the remaining assets in the pool, or the outstanding securities, once the pool size or outstanding securities falls below a specified amount. In the case of a synthetic securitisation, it may take the form of a clause extinguishing the credit protection<sup>713</sup>. In both cases the intention is to mitigate the costs of retaining a securitisation in place where this is no longer economically viable as the size of the pool, or outstanding securities, is simply too small.

7.5.9 Where a securitisation includes a clean-up call the following conditions apply. If they are not met, no regulatory capital recognition will be given to the securitisation (i.e. it is treated as unsecuritised)<sup>714</sup>. Firstly, the exercise of the call must not be mandatory, but at the discretion of the originating bank. Secondly, the clean-up call must not be structured to avoid allocating losses to investors, providers of credit enhancements or otherwise improve the position of third parties. Thirdly, the clean-up call can only be exercised when 10% or less of the original portfolio or securities remains outstanding (traditional securitisation, or credit-linked notes) or when 10% or less of the original reference portfolio remains (synthetic securitisation)<sup>715</sup>.

7.5.10 Clean-up calls that, when exercised, provide credit support are treated as the provision of implicit support. This would seem to cover any case where there has been a deterioration in the credit quality of the remaining pool since inception where a clean-up call is actually exercised<sup>716</sup>. Whether this is intended to be assessed fully on an *ex post facto* basis is unclear and national supervisors are responsible for implementation of this provision.

## 7.6 Due Diligence

7.6.1 Given the role of securitisation in the global financial crisis, inevitably new rules would be promulgated on due diligence, and the consequence of not (or being unable to) perform such due diligence. Under Basel III if the following requirements are not met then all exposures of a bank attract a 1250% risk weight<sup>717</sup>, which is calibrated to equate to a deduction from capital.

7.6.2 Banks must, as a general rule, have a comprehensive understanding of the risk characteristic of individual securitisation exposures, whether on- of off-balance sheet, as well as of the pools underlying those exposures<sup>718</sup>. Greater understanding is therefore required of the bank's own exposures than the underlying assets that are securitised reflecting inherent data limitations on

pool exposures. That said, the requirements on originators imposed by Basel III are intended to ensure that market practice develops so that non-regulated originators will be unable to sell/transfer securitisation exposures to regulated entities as a result of the 1250% risk weight.

- 7.6.3 Banks must be able to access performance information on the underlying pools of exposures on an on-going basis in a timely manner. As appropriate, this may include exposure type, percentage of loans 30, 60 and 90 days past due, default rates, pre-payment rates, loans in default, type of property, etc.<sup>719</sup>. In the case of re-securitisations (such as CDOs) the bank must have information not only on the underlying securitisation exposures, but also on the characteristics and performance of the asset pools underlying those securitisations<sup>720</sup>. This reflects the fact that the performance of a CDO is dependent both on the characteristics of the securitisation exposures as well as the assets underlying those securitisations. Logically, exposures to a CDO squared should require the bank to understand the characteristics, etc. of both levels of securitisation, as well as the asset pools.
- 7.6.4 Banks must have a thorough understanding of all structural features of a securitisation exposure that would materially impact the performance of the exposures, including the contractual waterfall, waterfall-related triggers, credit enhancements, liquidity enhancements, market value triggers and deal-specific definitions of default<sup>721</sup>.

## 7.7 Capital Requirements

- 7.7.1 Banks must hold capital against risks in all securitisation-related exposures. These can include retained tranches, investments in asset-backed securities, provision of credit enhancements or of a liquidity facility. Where a bank purchases securitisation exposures securitised by it, it must treat such exposures as retained securitisation exposures<sup>722</sup> as there is no risk transfer.
- 7.7.2 Risk-weighted assets on a securitisation exposure are calculated by multiplying the exposure amount by the appropriate risk weight determined by the hierarchy of approaches (IRB, ERBA and SA), applying applicable caps on exposures (see below)<sup>723</sup>.

### *Caps on securitisation exposure capital charges*

- 7.7.3 This section sets out capital adequacy caps applicable to securitisation exposures. The intention is to avoid any unduly onerous capital treatment as a result of the application of the securitisation framework in specific situations. It does not apply to re-securitisations owing to the greater risks in such securities.
- 7.7.4 The stated purpose of these caps is to continue the Basel II treatment that a bank should not have to hold more capital against a securitisation exposure than it would have had to do had the exposures not been securitised. As the December 2013 consultation document *Revisions to the Securitisation Framework* put it:

“An originator can view securitisation as similar to credit risk mitigation, as at least some of the risk of the underlying exposure(s) is transferred to

another party. On this view, it would be inappropriate for a bank to be compelled to hold more capital after securitisation than before. Supporting this concept is the operational requirement that significant risk be transferred in order to recognise any benefits from a securitisation for originators and sponsors.

Following this rationale, the Committee initially proposed to apply an overall cap to capital requirements not only to IRB banks ..., but also to all originators and sponsors, even if they cannot calculate IRB inputs for the underlying pool.

The Committee proposes that the overall cap be applicable regardless of the approach that is applied: Internal Ratings-Based Approach, External Ratings-Based Approach or Standardised Approach.

In the case mixed pools it would be inappropriate for a bank to be compelled to hold more capital after securitisation than before, as its risk should be reduced through the process of securitisation, subject to the significant risk transfer requirement. The implication is that the overall cap should be calculated by adding up the capital before securitisation; that is, by adding up the capital required under the general credit risk framework for the IRB and SA part of the pool<sup>724</sup>.

- 7.7.5 In the case of “senior” securitisation exposures (which, basically, means only the most senior tranche in the waterfall) banks are allowed to apply a “look through” approach under which the securitisation exposure receives a capital charge applicable to exposure weighted-average risk weight applicable to the underlying exposures, provided the bank has knowledge of the composition of the underlying exposures at all times. An example would be an originating bank that retains a super-senior tranche ranking higher than any sold and rated tranches.
- 7.7.6 In this case the risk weight under the IRB approach must be calculated after taking into account expected losses. If a bank uses exclusively the standardised approach or the IRB approach then the cap for senior exposures is the exposure-weighted average risk weight applicable to exposures under the standardised or IRB framework, as applicable. Where there are “mixed pools”, the IRB portion of the pool receives the IRB risk weight and the standardised pool the SA risk weight<sup>725</sup>. The Basel III text does not mention either the ERBA or SEC-IAA approaches, although it would be logical to apply these methods, where available, and relevant to determine the capital charge.
- 7.7.7 If the risk weight derived from applying the cap is less than that from the 15% floor (see below) then the risk weight deriving from the cap applies<sup>726</sup>.
- 7.7.8 If a bank uses the IRB approach under the hierarchy of methodologies then the bank is able to cap its capital charge for its exposures to a securitisation (including expected losses) at the IRB capital charge had the exposures not been securitised<sup>727</sup>.
- 7.7.9 If a bank uses the ERBA or SA approach to a securitisation exposure, then the maximum capital charge is equal to that applicable to the underlying exposures had they not been securitised.

- 7.7.10 For “mixed pools”, the same approach applies. A bank is not required to apply a capital charge for a securitisation exposure that is higher than the applicable capital charge before securitisation calculated under the standardised and IRB approaches. The IRB portion must include expected losses<sup>728</sup>. In respect of mixed pools applying both the ERBA and SA approaches the Basel III text caps the capital charge at that calculated under the IRB and SA approaches<sup>729</sup>.
- 7.7.11 The maximum aggregated capital charge for a bank’s securitisation exposures in the same transaction is equal to  $K_p \times P$ . For this purpose  $K_p$  equals the capital charge for an underlying pool of exposures, and  $P$  is the largest proportion of interest that a bank holds for each tranche of any given pool.
- 7.7.12 The following clarifications apply:
- (a) For a bank that has one or more securitisation exposure(s) that are in a single tranche of a given pool,  $P$  is equal to the proportion (as a percentage) that the bank holds in that tranche calculated as the total nominal amount of the bank’s exposures in the tranche, divided by the nominal amount of the tranche<sup>730</sup>.
  - (b) For a bank that has securitisation exposures that are in different tranches of a given securitisation,  $P$  equals the maximum proportion of interests across tranches<sup>731</sup>.
  - (c) The capital charge for the underlying pool ( $K_p$ ) is determined as follows. For an IRB pool, it is the capital charge had the IRB pool not been securitised ( $K_{IRB}$ ). For a pool under the standardised approach it is the capital charge under the standardised approach ( $K_{SA}$ )<sup>732</sup>. The ERBA and SEC-IAA approaches are not mentioned.
  - (d) The treatment of mixed pools is based on an exposure-weighted average of the capital charge under the ERBA and SA approaches<sup>733</sup>. It is unclear whether the exclusion of the SEC-IAA approach is intended or accidental.
  - (e) In applying the capital charge cap, the entire amount of any gain on sale and credit enhancing interest-only strips is deducted<sup>734</sup>.

## 7.8 Hierarchy of Methods

- 7.8.1 Unlike Basel II, Basel III now has a prescriptive hierarchy. A bank must use the IRB approach to securitisation exposures of an IRB pool unless instructed otherwise by its supervisor<sup>735</sup>. If a bank is unable to use the IRB approach (e.g. if it does not have permission to use an IRB approach), it must use the securitisation external ratings-based approach, if its national supervisor allows the ERBA approach to be used, and if there is an external rating that meets the operational requirements<sup>736</sup>. If the national supervisor allows the use of external ratings, an internal assessment approach (SEC-IAA) is also available for unrated exposures to a pool within a rated ABCP programme. This may be relevant for unrated credit enhancements and liquidity facilities. A precondition of using the SEC-IAA is that the bank has supervisory approval to use an IRB approach for non-securitisation exposures<sup>737</sup>.

- 7.8.2 Banks that cannot use the IRB, ERBA or SEC-IAA must use the standardised approach (SEC-SA)<sup>738</sup>. If they cannot, then a 1250% risk weight applies<sup>739</sup>.
- 7.8.3 If a bank cannot apply the IRB approach to 95% of all the underlying exposures, then the normal (non-IRB) hierarchy applies (ERBA/SEC-IAA, SA or 1250% risk weight)<sup>740</sup>.

#### *Overlapping exposures*

- 7.8.4 A specific treatment applies to so-called “overlapping” exposures. Exposures A and B overlap if and only if the performance by the bank of its obligations in respect of exposure A will preclude in all circumstances a loss on exposure B. An example is a bank providing credit support to a tranche of notes and holding some of the notes. In this case, if the bank performs its obligations there will be no loss on its own holding of the notes. In this case only exposure A is risk-weighted and exposure B is disregarded<sup>741</sup>.
- 7.8.5 In identifying overlaps, banks are allowed to split or expand exposures to notionally derive an overlap<sup>742</sup>. Splitting means dividing up the actual exposure to two notional ones, one that is treated as overlapping, in the sense referred to above, and the other as not overlapping. An exposure may be “expanded” by assuming the exposure is larger than it contractually is, such as by expanding notionally the trigger events or the size of the credit enhancements or liquidity facility provided, when determining the capital treatment<sup>743</sup>.
- 7.8.6 An example of this is given in Basel III. A liquidity facility may not contractually cover defaulted assets, or may not fund an ABCP programme in certain circumstances. For regulatory capital purposes this would not constitute an overlap with notes held by the bank issued by the ABCP conduit. However, a bank may calculate the capital charge for the liquidity facility as if it were expanded to cover defaulted assets, to preclude losses on the notes, and then only calculate a capital charge on the facility (and not the notes held)<sup>744</sup>.
- 7.8.7 A bank may recognise overlaps between the trading and banking books, provided the bank can calculate the relevant capital charges and compare them<sup>745</sup>.

### **7.9 Re-securitisation Exposures**

- 7.9.1 The Basel Committee determined that as a result of the financial crisis neither external ratings nor an IRB approach could be used for re-securitisation exposures as neither could accurately address the risks in such complex transactions. As a result, only the standardised approach may be used, although adjustments apply to take account of the higher risks on such exposures<sup>746</sup>.

### **7.10 Non-Performing Securitisations**

- 7.10.1 A bespoke capital treatment applies to securitisations of non-performing loans (see below).



## 7.11 Implicit Support

- 7.11.1 Implicit support arises when a bank provides support to a securitisation exposure beyond its contractual obligations after the inception of the securitisation. Basel III requires capital to be held against all of the underlying exposures associated with the securitisation as if they had not been securitised<sup>747</sup>.

## 7.12 Recognition of Credit Risk Mitigation

- 7.12.1 Under all approaches credit risk mitigation may be recognised.
- 7.12.2 If the bank applies the IRB approach then collateral recognition limited to that available under the foundation IRB approach<sup>748</sup>. Guarantees and credit derivatives must comply with the standardised approach to credit risk mitigation<sup>749</sup>. Advanced IRB collateral, or IRB-recognised sellers of credit protection may not be recognised. A partial exception to this allows collateral pledged by SPVs to be recognised<sup>750</sup>.
- 7.12.3 For banks applying the standardised approach, understandably, only collateral and credit derivatives/guarantees recognised under the standardised approach are eligible<sup>751</sup>.
- 7.12.4 Where a bank provides full, or pro rata, credit protection to a securitisation exposure, it is treated as directly holding the securitisation exposure for which it provides credit protection for regulatory capital purposes<sup>752</sup>.
- 7.12.5 Where a bank purchases credit protection then it may recognise this protection under the credit risk mitigation framework (i.e. the standardised and foundation IRB approaches)<sup>753</sup>.
- 7.12.6 Tranched credit protection is notionally split into protected and unprotected sub-tranches. The protection provider calculates its capital requirement on the basis of a direct exposure to the particular sub-tranche in accordance with the hierarchy set out in the next paragraph. Credit protection buyers determine their capital requirement in accordance with the credit risk mitigation framework for the protected sub-tranche, and as normal under the specified hierarchy of approaches for unprotected exposures<sup>754</sup>.
- 7.12.7 The hierarchy of approaches is as follows. If the bank is required to use the IRB approach, or the standardised approach, then that approach must be used<sup>755</sup>. Where the ERBA approach is used the sub-tranche of highest seniority attracts the risk weight applicable to the original securitisation exposure. Lower-ranking tranches receive the risk-weight applicable from an inferred rating if this is possible. Otherwise, the standardised approach applies with modified parameters<sup>756</sup>. A lower ranking sub-tranche is always regarded non-senior even if the original tranche was senior<sup>757</sup>.

## 7.13 Simple, Transparent and Comparable (STC) Securitisations

- 7.13.1 This category of securitisations benefits from lower capital charges as securitisations falling within the definition of STC securitisations are considered to present less risk. There are therefore significant potential

advantages of structuring a securitisation as being simple, transparent and comparable (STC), where possible. However, some structures (such as synthetic securitisations) can never be a STC securitisation, and in other cases there may be commercial considerations that preclude the securitisation from being an STC securitisation. Apart from conferring regulatory capital benefits, all the other rules applicable to securitisations continue to apply in full.

- 7.13.2 STC securitisations include both non-ABCP traditional securitisations that meet specified criteria and ABCP conduits and/or transactions financed by such conduits that meet certain criteria<sup>758</sup>. The criteria differ, although there is a degree of overlap.
- 7.13.3 Originators or sponsors of a STC securitisation must reveal to investors “all necessary information” to enable investors to determine whether or not the securitisation is STC compliant. Investor banks are then required to make their own assessment of whether the securitisation is compliant<sup>759</sup>. This is important as the STC requirements apply to all securitisations, regardless of whether the originator/sponsor is a bank, corporate or other entity<sup>760</sup>. However, where a bank acts as the originator and retains certain tranches of the securitisation, then the originator will determine whether or not the securitisation is an STC securitisation<sup>761</sup>.
- 7.13.4 In principle, the STC criteria must be met at all times, although the nature of the criteria is such that some will only need to be checked at origination. Investors are expected to take into account developments that might invalidate a compliance assessment<sup>762</sup>, such as failure to provide investor reports, or changes to the underlying documentation that make the securitisation non-STC compliant<sup>763</sup>.
- 7.13.5 It will be seen that many of the Basel III STC criteria are either qualitative or open-textured and incapable of precise definition. It follows that in some cases it may prove difficult to assess whether a given securitisation is or is not STC compliant. In this case it may fall to national supervisors when providing guidance to assess whether a particular securitisation is STC compliant. A further aspect of the criteria requiring experience with securitisations may exclude new entrants for a period of time from being able to apply the STC risk weights regardless of whether or not the securitisation would otherwise have been STC compliant.

#### *Criteria for traditional securitisations*

- 7.13.6 **Homogeneity.** The assets underlying the securitisation should be credit claims or receivables that are homogenous. In making this assessment, consideration should be given to asset type, jurisdiction, legal system and currency. The assets should have contractually identified periodic payment streams, and interest payments should reference commonly encountered market interest rates<sup>764</sup>.
- 7.13.7 In assessing homogeneity, the following principles should be applied:
- (a) the asset pool should be such that investors do not need to analyse and assess materially different legal and/or credit risk factors;

- (b) the assessment of homogeneity should be based on common risk drivers;
- (c) claims or receivables should have standard obligations that result in a periodic and well-defined stream of payments to investors; and
- (d) the repayment of securities should rely mainly on the proceeds of the securitised assets, as opposed to refinancing or resale of assets in the pool<sup>765</sup>.

7.13.8 **Asset performance history.** Verifiable loss performance data, such as defaults, should be available for assets<sup>766</sup> with substantially similar risk characteristics to those being securitised for a sufficient period of time to permit meaningful evaluation. The minimum performance history required is five years for retail securitisations and seven years for all other securitisations<sup>767</sup>. The sources of, and access to, data should be made available to all market participants<sup>768</sup>. Investors should also consider the performance history of the parties involved with a securitisation e.g. originator, sponsor, etc.<sup>769</sup>. The originator/sponsor, as well as the original lender (if different) should have sufficient experience in originating the type of assets being securitised<sup>770</sup>.

7.13.9 **Payment status.** None of the assets in the pool may be delinquent or in default at the inception of the securitisation<sup>771</sup> (subsequent defaults do not render the securitisation non-STC compliant as defaults are inevitable). The following detailed requirements apply:

- (a) the underlying obligors have not been subject to insolvency proceedings or debt restructuring within three years of exposures being included in the securitisation;
- (b) none of the underlying obligors has an adverse credit history in any public credit registry;
- (c) the current credit rating or credit score of the obligors in the pool is not associated with a significant risk of default; and
- (d) there is no dispute between the obligors and the original lender in respect of the loan<sup>772</sup>.

7.13.10 In addition, at the time of inclusion in the pool all obligors must have made one payment unless the terms of the loan requires discharge in a single instalment at maturity of the facility<sup>773</sup>.

7.13.11 Many of these criteria seem vague. In particular, it is not obvious what an “adverse credit history” or a “significant risk of default” really means. In the absence of guidance from their supervisor, it seems likely that different banks or groups will take different approaches.

7.13.12 The assessment of compliance is made 45 days or less from the closing date<sup>774</sup>.

7.13.13 **Underwriting standards.** Originators must demonstrate to investors that any exposures in the pool was originated in the ordinary course of business in accordance with non-deteriorating underwriting standards. Changes to

underwriting standards must be disclosed, and the standards applied to securitised exposures must be as robust as in respect of assets retained on the originator's balance sheet. The originator must ensure before granting a loan that the borrowers have the ability and will to make timely payments under the loan<sup>775</sup>. All credit claims and receivables must be originated in accordance with sound and prudent underwriting criteria<sup>776</sup>. Where claims are acquired from a third party vendor for securitisation, the purchaser must review the underwriting standards applied by the original lender before securitising them, including an assessment of the willingness and ability of the borrowers to repay<sup>777</sup>. These requirements seem inspired by certain poor origination practices prior to the financial crisis, where some lenders failed to follow prudent practices when making loans as the loans would be securitised and therefore removed from their balance sheet.

- 7.13.14 **Asset selection.** The performance of the securitisation should not rely on the selection of assets through active management on a discretionary basis. Obligations forming part of the pool of assets should be transferred on the basis of clearly defined eligibility criteria. Any replenishments of the pool must be made based on objective criteria and not "cherry picked"<sup>778</sup>.
- 7.13.15 **Credit quality.** At the portfolio cut-off date all exposures must have the following risk weights or lower (after applying any available credit risk mitigation) under the standardised approach to credit risk and credit risk mitigation:
- (a) 40% for exposures in the regulatory residential real estate sub-portfolio;
  - (b) 50% for exposures in the regulatory commercial real estate sub-portfolio;
  - (c) 50% for exposures in the other real estate sub-portfolio;
  - (d) 50% for exposures in the ADC sub-portfolio;
  - (e) 75% for exposures in the regulatory retail sub-portfolio; and
  - (f) 100% for other exposures<sup>779</sup>.
- 7.13.16 **Granularity.** At the portfolio cut-off date no single exposure may exceed 1% of the exposure value of all exposures in the pool<sup>780</sup>. In jurisdictions with structurally concentrated corporate loan markets this figure may be increased to 2%, with prior supervisory consent, provided that the originator or sponsor retains subordinated tranches which cover at least 10% of losses. These retained tranches are ineligible for STC treatment<sup>781</sup>.
- 7.13.17 **Transfer.** The transfer of exposures must be by way of a true sale. The following requirements must be met before a true sale will be recognised:
- (a) the claims/receivables must be enforceable against the underlying obligors<sup>782</sup>, and the securitisation documentation must include representations and warranties to this effect;

- (b) the claims/receivables are beyond the reach of the seller, its creditors or any liquidator, and are not subject to material re-characterisation risk or clawback<sup>783</sup>;
- (c) the securitisation is not effected by derivatives or guarantees (i.e. it is a traditional securitisation);
- (d) there is effective recourse to the underlying obligors;
- (e) the transaction is not a re-securitisation; and
- (f) a third party provides an independent legal opinion on the foregoing<sup>784</sup>.

7.13.18 It is not possible for external lawyers to ascertain the enforceability of each obligation in the pool. Nor can an external legal opinion address questions of fact, such as whether there are re-securitisation exposures in the securitised pool, as opposed to advising on compliance of the legal documentation with the aforementioned rules. We assume that external lawyers will not be expected to go beyond normal practice in issuing legal opinions.

7.13.19 In some jurisdictions, it may be possible to transfer credit claims other than through a true sale, where there are material obstacles to achieving a true sale<sup>785</sup>. Examples given in the Basel III text are equitable assignments and a perfected contingent transfer<sup>786</sup>.

7.13.20 **Initial and on-going data.** Investors must be provided before pricing of a securitisation with sufficient loan-level data or (in the case of granular pools) summary stratification data on the risk characteristics of the pool. The originator must publish quarterly reports on loan-level data or (in the case of granular pools) stratification data to facilitate the trading of securities in the secondary market. Prior to the inception of the securitisation the conformity of the initial pool of exposures with the contractual eligibility requirements must be reviewed by an independent third party e.g. an accountant or the calculation agent<sup>787</sup>. This may take the form of a review of a representative sample. The report need not be disclosed, but its results must be disclosed in the initial offering documentation<sup>788</sup>.

7.13.21 **No reliance on sale or refinancing of exposures.** The securitisation structure should not rely on the sale or refinancing of underlying credit claims or receivables in order to repay the securities issued. The sale or refinancing of underlying exposures may be permitted if the pool is sufficiently granular and has a sufficiently differentiated repayment profile<sup>789</sup>.

7.13.22 **Interest rate and currency mismatches.** Interest rate and currency mismatches must be appropriately mitigated. This does not require a matching hedge. Any swaps should be documented in industry-standard master agreements (e.g. ISDA master agreements). Derivatives are only allowed under the STC framework if entered into for genuine hedging purposes<sup>790</sup>.

7.13.23 **The waterfall.** The priority of payments for all liabilities must be clearly defined at the inception of the securitisation. This must be verified by a legal opinion confirming the enforceability of the contractual waterfall<sup>791</sup>.

Presumably, this is directed at preferred creditors under applicable insolvency laws as well as general contractual enforceability. Basel III prohibits junior liabilities having payment preference over senior liabilities, or so-called “reverse” cash flow waterfalls. All triggers affecting the cash flow waterfall, payment profile or priority of payments must be fully disclosed in offering documents and investor reports. Investor reports must also allow investors to monitor over time the evolution of indicators subject to triggers<sup>792</sup>. A cash flow model, or information on the waterfall allowing its modelling, must be made available to investors both before pricing and on an on-going basis<sup>793</sup>. Any debt forgiveness, forbearance, payment holidays, restructuring and asset performance remedies must be clearly identified on an on-going basis in the periodic reports<sup>794</sup>.

- 7.13.24 Securitisations with a replenishment period must include either early amortisation provisions and/or triggers terminating the replenishment period including in the event of:
- (a) a deterioration in the credit quality of the underlying exposures;
  - (b) a failure to acquire new underlying exposures of similar (or better) credit quality; and
  - (c) the insolvency of the originator or servicer<sup>795</sup>.
- 7.13.25 Following the occurrence of an event of default, an acceleration event or a trigger, the securitisation positions must be repaid in order of seniority, and there must not be provisions in the documentation requiring the immediate realisation of all the underlying assets at market value<sup>796</sup>.
- 7.13.26 **Voting and enforcement rights.** If the originator or sponsor becomes subject to insolvency proceedings, then all voting and enforcement rights must be transferred to the securitisation (presumably, the SPV). These rights must be clearly defined<sup>797</sup>.
- 7.13.27 **Documentation and legal review.** Sufficient initial offering (e.g. draft offering circular, draft offering memorandum or red herring) and draft underlying documentation (e.g. asset sale agreement, servicing and back-up servicing agreement, administration and cash management agreement, trust deed, security deed, agency agreement, bank account agreements, inter-creditor agreement, master trust, swap documentation, liquidity facilities and legal opinions) must be made available to investors, and potential investors, on a continuous basis either prior to pricing or when legally permissible to provide full disclosure of legal information, commercial information and risk factors. Final offering documents must be available from closing, and all documentation shortly thereafter. An independent legal practice (law firm) must review the documentation, e.g. lawyers instructed by the arranger or trustee<sup>798</sup>.
- 7.13.28 **Alignment of interest.** Originators and sponsors must retain a material net economic exposure (which is undefined) to the pool of securitised assets, and demonstrate a financial incentive in the performance of the assets after securitisation<sup>799</sup>. This is to try to ensure that the interests of the originator/sponsor are aligned with those of investors, in order to prevent

securitisation of poor quality assets, such as occurred in the run-up to the financial crisis.

- 7.13.29 **Servicers.** Servicers must have expertise in the servicing of the underlying claims or receivables, supported by a management team with extensive industry experience. A servicer must act in accordance with reasonable and prudent standards. Policies, procedures and risk management controls must be well documented, and follow good market practice. There must be strong systems and reporting capabilities<sup>800</sup>.
- 7.13.30 **Trustees/fiduciaries.** Such parties must act on a timely basis in the best interests of the noteholders, and the initial offering documentation and all underlying documentation (see above) must contain provisions facilitating the resolution of conflicts between different classes of noteholders by the trustee<sup>801</sup>. It should be noted that under English law a trustee's duty of care is not regarded as a fiduciary duty. Fiduciary duties are confined to those duties specific to fiduciaries and trustees<sup>802</sup> e.g. the "no conflict" rule (a fiduciary must not allow a conflict to exist between his own interest and that of his client, or between two clients)<sup>803</sup> and the "no profit" rule (a fiduciary must not make a profit at the expense of his client)<sup>804</sup>. Basel III adds that the trustee/fiduciary must demonstrate sufficient skills and resources to comply with its duty of care in performing its role in the securitisation. Remuneration must be sufficient to incentivise these parties to meet their responsibilities in full and in a timely way<sup>805</sup>. This sits slightly incongruously with English law as a trustee's duty of care is not fiduciary (see above) and a fiduciary is only normally entitled to remuneration if expressly agreed by the beneficiaries. The rationale is, however, clear: to ensure the trustee acts carefully in discharging its responsibilities under the securitisation and has an economic incentive to do so.
- 7.13.31 **Transparency.** The contractual obligations, duties and responsibilities of all key parties must be clearly defined in the initial offering and all underlying documentation. There must be provisions addressing the replacement of servicers, bank account providers, swap counterparties and liquidity providers in the event of non-performance, insolvency or a deterioration in their creditworthiness (e.g. a ratings downgrade below a specified threshold)<sup>806</sup>. Reports to investors must disclose income and disbursements (including deferment, forbearance and repurchases<sup>807</sup>), such as principal, interest payments, restructured obligations and credit events in the underlying portfolio<sup>808</sup>.

#### *Criteria for ABCP short-term securitisations*

7.13.32 The following definitions apply to ABCP STC securitisations:

- (a) An "ABCP conduit" is an SPV which issues commercial paper.
- (b) An "ABCP programme" is a programme of commercial paper issued by an ABCP conduit.
- (c) "Assets" or an "asset pool" are the credit claims or receivables underlying a transaction in which a conduit holds a beneficial interest.

- (d) “*Investors*” are holders of the commercial paper issued under an ABCP programme, or any type of exposure to the conduit representing a liability of the conduit e.g. a loan.
- (e) An “*obligor*” is the borrower underlying a credit claim or receivable that forms part of an asset pool.
- (f) A “*seller*” is the party that: (i) originated the credit claims or receivables, or (ii) purchased the claims from the original lender, and (iii) (in either case) transfers those credit claims or receivables to the ABCP conduit.
- (g) A “*sponsor*” is the sponsor of an ABCP conduit.
- (h) A “*transaction*” is the transaction in which the ABCP conduit holds a beneficial interest<sup>809</sup>.

7.13.33 Compliance with the STC criteria depends on the level of the exposure. If the exposure is at the level of the transaction, then the transaction will qualify for STC treatment if the criteria are complied with at the level of the transaction<sup>810</sup>. If, however, the exposure is at the conduit level then the STC criteria must be complied with both at the transaction level and at the conduit level<sup>811</sup>.

7.13.34 **Nature of assets.** The assets underlying the transaction must be homogenous in terms of asset type with contractually identified payment streams. Securitisation exposures are expressly excluded<sup>812</sup> (although programme-wide credit enhancements do not make a conduit ineligible)<sup>813</sup>. The sponsor must make representations and give warranties to the investors in the securitisation documentation.<sup>814</sup> Provided that each individual underlying exposure is homogenous in terms of asset type, a conduit can be used to finance transactions of different asset types<sup>815</sup>.

7.13.35 The following criteria apply when determining if a pool is homogenous:

- (a) there must be no need to analyse and assess materially different legal or credit risk factors when carrying out due diligence;
- (b) the pool must have common risk drivers, including similar risk factors and profiles;
- (c) the obligors must have standard features which result in a periodic stream of payments to investors; and
- (d) repayment of securities issued must not rely on refinancing or resale of the assets in the pool, although partial reliance is permitted providing refinancing or resale is sufficiently distributed within the pool and the residual values on which the transaction relied are sufficiently low<sup>816</sup>.

7.13.36 **Asset performance history.** The sponsor must make available to investors sufficient stratified loss performance data, such as delinquencies/defaults for a time period long enough to permit meaningful evaluation<sup>817</sup>. A sponsor must obtain from the original lender sufficient data to permit meaningful assessment<sup>818</sup>.



- 7.13.37 The sponsor must have sufficient experience in risk analysis with exposures similar to those being securitised. It must also have well documented procedures and policies regarding the underwriting of transactions and the on-going monitoring of the performance of securitised exposures. The original lender must also have sufficient experience in underwriting the underlying loans. Responsibility for this is placed on the sponsor, and the management of the originator must also have such experience. Investors will request confirmation from the sponsor that the performance history of the originator has at least three years' experience for retail claims, and five years for other exposures<sup>819</sup>.
- 7.13.38 **Asset quality.** The sponsor is required to make representations and warranties to investors that each individual transaction is not, at the time of acquisition, in default or delinquent, or subject to a material risk of increase in expected losses. This is required based on representations made by the seller(s)<sup>820</sup>. Further, the original seller or sponsor must verify that in respect of each obligation in the pool: (a) the obligor has not been subject to insolvency or debt restructuring in the last three years, (b) the obligor is not recorded on a public credit registry of persons with an adverse credit history, (c) the obligor does not have an external credit rating or credit score indicating a significant risk of default, and (d) the credit claim is not subject to a dispute<sup>821</sup>. This must be assessed no earlier than 45 days before the acquisition by the conduit<sup>822</sup>. The qualitative nature of such criteria has already been remarked on.
- 7.13.39 **Underwriting standards.** The conduit must represent to investors that:
- (a) (save as set out below) it has taken steps to verify that the transactions in the conduit, and any underlying credit claims and receivables have been originated subject to consistent underwriting standards;
  - (b) explain how this is the case; and
  - (c) disclose any material changes to underwriting standards, as well as the timing and purpose of such changes<sup>823</sup>.
- 7.13.40 Sponsors must also inform investors of the material selection criteria used in selecting sellers<sup>824</sup>. Sponsors are also required to ensure that the seller(s) (as original lender):
- (a) originated any credit claims or receivables in the ordinary course of business subject to non-deteriorating underwriting standards; and
  - (b) assessed the obligors as being able and willing to repay the obligation<sup>825</sup>.
- 7.13.41 Presumably, this is to be effected through representations and warranties, together with adequate due diligence, by the sponsor or by an independent third party. Basel III states that the sponsor must “review the underwriting standards (i.e. to check their existence and assess their quality) ... and to ascertain that [originators] have assessed the obligors’ ‘ability and volition to make timely payments’ on their obligations”<sup>826</sup>. Although it is not stated, we assume this will be possible to satisfy based on an analysis of a representative

sample, as it would be impractical to carry out due diligence on a transaction-by-transaction basis.

- 7.13.42 At conduit level, the sponsor must:
- (a) give representations and warranties about the checks it has carried out on the enforceability of the underlying assets; and
  - (b) disclose to investors the representations and warranties received by it from the seller(s) that the underlying obligations in the pool(s) are not subject to any condition that would adversely affect their enforceability<sup>827</sup>. This clearly places an obligation on the sponsor to obtain such representations and warranties from the seller.
- 7.13.43 **Asset selection and transfer.** Sponsors must also ensure that any credit claims or receivables satisfy clearly defined eligibility criteria and are not actively selected after the closing date, actively managed, or otherwise subject to discretionary cherry-picking<sup>828</sup>. The last requirement is not breached by replenishment of the asset pool provided it is effected on a non-discretionary basis<sup>829</sup>.
- 7.13.44 The transactions with the conduit must be a true sale. Basel III specifically requires that the underlying assets must:
- (a) be enforceable against the obligor;
  - (b) be placed beyond the reach of the seller, its creditors or insolvency official, and must not be subject to material re-characterisation or claw-back risks;
  - (c) not be effected through credit derivatives or guarantees (i.e. a synthetic securitisation), but by a transfer of the credit claims; and
  - (d) have recourse to the obligor<sup>830</sup>.
- 7.13.45 This is a somewhat rag-bag list. Only the second point is relevant to a true sale (which requires a legally enforceable transfer of the obligations and is a *sine qua non* of a traditional securitisation). Enforceability of underlying obligations is clearly important for the obligations being valuable as collateral, but can only ever be assessed on a portfolio-basis as an assessment of compliance of lending with applicable laws on a transaction basis (including consumer protection laws) is likely to be impractical in many cases as it is fact specific. The exclusion of securitisation and re-securitisation positions, or credit derivatives, follows from the definition of an STC securitisation. As with other STC securitisations, conduits may use “other means” where a true sale faces material obstacles<sup>831</sup>.
- 7.13.46 Basel III seems to require an in-house or external legal opinion, that: (i) the underlying credit claims or receivables are enforceable against the obligor, and (ii) are beyond the reach of the seller<sup>832</sup>. Whilst the latter should not present any real difficulty (subject to customary assumptions, reservations and exclusions), it seems hard to see how lawyers could opine on the enforceability of the underlying obligations given the fact-sensitive nature of

the inquiry (legal opinions never address matters of fact as they cannot be known by the lawyer giving the opinion). Admittedly, it would be possible (but very difficult) to review all of the underlying documentation, but it is hard to see what practical benefit would be obtained, as defaults on retail and some corporate exposures are only loosely related to defects in legal enforceability i.e. many/most obligors that can pay will pay even if the underlying credit exposure is unenforceable under applicable laws due to technical deficiencies in compliance.

- 7.13.47 It is not clear, however, whether Basel III requires this, as the requirement in CRE 40.122 which cross-refers to CRE 40.118(1) refers to it being met at the level of the “true sale and the transfer of assets”, whereas CRE 40.118(1) refers to the underlying credit claims or receivables being enforceable against the obligor. If Basel III merely requires enforceability of the *transaction* with the conduit, as opposed to the underlying obligors, then this requirement should present no real difficulty. Hopefully, national supervisors, in implementing the Basel standards, will make clear that only transaction documentation enforceability is required. Where there is an external rating, the ratings agency is likely to carry out some due diligence on the underlying obligors as part of its internal processes in assigning a rating.
- 7.13.48 **Data and disclosure requirements.** Sponsors are required to disclose certain data to investors, both at the outset and on an on-going basis<sup>833</sup>. Standardised investor reports with specified information must also be provided<sup>834</sup>.
- 7.13.49 **Liquidity and credit facilities.** Sponsors are required to provide liquidity facilities and any credit enhancements for an ABCP programme issued by a conduit<sup>835</sup>. Such support must be provided either at the level of the programme as a whole, or at the level of transactions within an overall programme<sup>836</sup>. Such facilities must enable investors to rely on the sponsor to receive timely and full repayment of commercial paper issued by the conduit<sup>837</sup>. Investors should also be fully protected against credit, liquidity, and dilution risks<sup>838</sup>, as well as other risks<sup>839</sup>. Further “[t]he full support provided should be able to irrevocably and unconditionally pay the ABCP liabilities in full and on time”<sup>840</sup>. Disclosure requirements apply<sup>841</sup>.
- 7.13.50 However, these requirements cannot be taken to mean that investors in commercial paper cannot suffer an unexpected credit-related loss if the pool of assets falls in value, or becomes worthless, as if this were the case there would be no transfer of credit risk to investors.
- 7.13.51 Where there is more than one sponsor, then the majority of support (in terms of coverage) must be provided by a single sponsor, the main sponsor<sup>842</sup>. There are specific requirements where the sponsor suffers a ratings downgrade (increasing the credit risk to investors in the commercial paper issued by the conduit), or where a funding commitment is not renewed. In this case, the sponsor is required to collateralise its commitments in cash<sup>843</sup>.
- 7.13.52 **Redemption cash flow.** Unless the underlying pool is sufficiently granular with sufficiently distributed repayment profiles at transaction level, repayment must depend on the general ability and willingness of the obligor to repay, as opposed to refinancing or selling the collateral, or drawing on liquidity facilities provided by the sponsor(s)<sup>844</sup>. It follows that a sponsor

cannot satisfy this requirement by means of liquidity facilities provided by itself<sup>845</sup>.

- 7.13.53 **Interest rate and currency risk.** Interest rate and currency risks at transaction-level or conduit-level must be appropriately mitigated. This can be done through appropriate hedging agreements such as swaps documented under standard ISDA documentation<sup>846</sup>. Perfect hedges, however, are not required. Non-derivative hedges are also acceptable if fully-funded (i.e. collateralised)<sup>847</sup>.
- 7.13.54 **The waterfall and commercial paper.** The sponsor must ensure that priorities of payment (i.e. the waterfall) are clearly defined at the time of acquisition of interests in transactions by the conduit. “Appropriate legal comfort” concerning the waterfall’s enforceability must be provided<sup>848</sup>. In most securitisations this will be through a legal opinion confirming that the priority of payments is valid and enforceable. The sponsor must also ensure that all triggers affecting the cash flow waterfall are fully disclosed in the transaction documentation and reports, with information in the reports that clearly identify breach status, the ability for a breach to be remedied and the consequences of the breach<sup>849</sup>. Any triggers breached between payment dates must also be disclosed on a timely basis in accordance with the transaction documents<sup>850</sup>. Where the asset pool in which the conduit holds an interest is itself tranching (i.e. a securitisation position) then the position in the structure held by the conduit must be the most senior, and subordinated positions cannot enjoy payment preference<sup>851</sup>. This suggests that ABCP securitisations may be eligible for STC treatment where the underlying asset pool is itself a securitisation, provided that the conduit holds the most senior tranche.
- 7.13.55 In the case of securitisations with a replenishment period, there must be either an early amortisation provision, or a trigger terminating the replenishment period, in the case of a deterioration in the credit quality of the underlying exposures, an inability to replenish with exposures of similar credit quality, or the occurrence of an insolvency event in respect of the seller<sup>852</sup>.
- 7.13.56 Policies with regard to delinquency, default, dilution or restructuring of the underlying obligors in the pool must be clearly identified so that debt forgiveness, forbearance, payment holidays, restructuring and the like can be identified on an on-going basis<sup>853</sup>.
- 7.13.57 Sponsors must obtain, before the conduit acquires a beneficial interest in a transaction, liability cash flow analysis or information on the cash flow provisions to enable proper analysis of the cash flow waterfall<sup>854</sup>.
- 7.13.58 A sponsor is required to make representations and warranties to investors that all of the foregoing requirements are met, and, in particular, that it can analyse the cash flow waterfall for each transaction. The sponsor must also make available to investors a summary of the waterfall and credit enhancements at both programme and transaction level<sup>855</sup>.
- 7.13.59 Commercial paper issued under the programme must not include extension options, or other features, which could extend the final maturity of the paper<sup>856</sup>. Curiously, the text adds “where the right of trigger does not belong

exclusively to investors”<sup>857</sup>. As an extension to the term of the commercial paper increases the risk to investors, it may seem logical to permit investor-extensions. However, in a declining interest rate environment, investors may extend the paper if a roll-over would lock-in a higher coupon. In any case, to constitute “commercial paper”, as opposed to a term loan, the tenor must be short (in the United States, up to 270 days, but on average 30 days<sup>858</sup>, and in England, a tenor of up to one year). Also, regulatory rules generally ensure that commercial paper is short term to prevent the issuance of such paper being regulated as a banking business<sup>859</sup>.

- 7.13.60 **Insolvency of parties.** Investors must be provided by the sponsor with information on their enforcement rights against the underlying credit claims should the sponsor become insolvent<sup>860</sup>. In the event that the seller becomes insolvent all voting and enforcement rights must be transferred to the conduit. In any event voting and enforcement rights must be clearly defined<sup>861</sup>.
- 7.13.61 **Documentation and legal review.** The initial offering documentation for the ABCP programme must be provided to investors (and be available to potential investors) within a reasonable period of time before issuance. Investors must be provided with comprehensive risk factors in a readily understandable format<sup>862</sup>. The sponsor must also ensure that the terms and documentation of conduits is reviewed and verified by external lawyers prior to publication, and also for material changes. Lawyers can certainly review documents but it is not clear what is meant by verification, as all external lawyers can confirm is if the documentation is legally enforceable and, in some cases only, whether it conforms to existing market practice<sup>863</sup>.
- 7.13.62 The sponsor must receive sufficient initial offering documentation for each transaction and be provided within a reasonable period of time prior to inclusion in the conduit with full disclosure of the information and risk factors required to provide liquidity facilities and/or credit enhancements.
- 7.13.63 **Skin in the game.** Either the original seller, or the sponsor, must retain a material net economic exposure to the securitised exposures, and must have a financial interest in the performance of the exposures<sup>864</sup>. This is another lesson of the financial crisis, where under the originate-to-distribute model originators could have no economic interest in the performance of loans that they originated once they had successfully been securitised. This contributed to a decline in underwriting standards, and the origination of loans that had a high risk of default (including, but not limited to, sub-prime and alt-A mortgages). Unlike under EU law there is no prescribed threshold.
- 7.13.64 **Maturity transformation.** Maturity transformation (the making of longer-term loans to support short-term borrowing) by ABCP conduits must be limited. This is to reduce the risk of the conduit being unable to repay the commercial paper at maturity, or being unable to refinance it through a new issue of such paper. Sponsors must ensure that the weighted average maturity of all the transactions is three years or less. This figure is calculated as the higher of:
- (a) the exposure-weighted average residual maturity of the conduit’s beneficial interests held, or the assets purchased by the conduit; and

(b) the exposure-weighted average maturity of the underlying assets financed by the conduit using a formula<sup>865</sup>.

- 7.13.65 **Status of sponsor.** The sponsor must be a bank subject to appropriate prudential standards and levels of supervision<sup>866</sup>. It need not be a bank subject to the Basel III framework, or an equivalent framework, if it is not internationally active, and its national supervisor applies a different framework. This may (but need not) include liquidity, leverage and other requirements. Risk-based capital requirements applicable under national law must, however, be adhered to<sup>867</sup>.
- 7.13.66 **Representations and warranties.** The sponsor of the conduit must provide investors with representations and warranties at conduit level that the following criteria are satisfied *at the transaction level* that the seller and other parties responsible for origination and servicing:
- (a) have well-documented procedures and policies to ensure appropriate servicing;
  - (b) have expertise in the origination of the same or similar assets;
  - (c) have extensive servicing and work-out expertise, and a proven track record in loss mitigation;
  - (d) have expertise in the servicing of the underlying claims; and
  - (e) are supported by a managing team with extensive industry experience<sup>868</sup>.
- 7.13.67 The sponsor must provide representations and warranties to investors that the above criteria are met, and explain how they are met. Equally, representations and warranties must be given that the seller's policies, procedures and risk management controls are well-documented, adhere to good market practices and are compliant with applicable regulatory requirements<sup>869</sup>. Sponsors must also have expertise in providing liquidity facilities and credit enhancements in the context of ABCP conduits<sup>870</sup>.
- 7.13.68 At transaction level the sponsor must obtain from the original seller(s) the representations referred to above<sup>871</sup>.
- 7.13.69 **Transparency and documentation.** The duties of all key parties must be clearly defined in all documentation of the conduit and the ABCP programme (but not in respect of underlying transactions)<sup>872</sup>. The sponsor must represent and warrant that this is the case at transaction level<sup>873</sup>. The documentation must also provide for the replacement of key parties in the event of a breach of contract, their insolvency or a decline in their credit-worthiness<sup>874</sup>. Investors must also be provided with information about liquidity facilities and credit enhancements<sup>875</sup>.
- 7.13.70 At transaction level, the sponsor is required to undertake due diligence. The duties and responsibilities of all key parties must be clearly defined<sup>876</sup>, and provisions to replace such parties must be documented<sup>877</sup>. There are specified requirements in respect of performance reports<sup>878</sup>.

- 7.13.71 **Credit quality of underlying exposures.** In order to avoid the creation of unduly risky securitisations under the STC framework, Basel III specifies certain minimum requirements in respect of credit quality. All underlying exposures included in the pool must meet the following minimum risk weights under the standardised approach (or presumably lower), after taking into account any available credit risk mitigation:
- (a) 40% on a value-weighted average exposure basis for the portfolio in the case of regulatory residential real estate exposures;
  - (b) 50% on an individual exposure basis where the exposures are regulatory commercial real estate, other real estate or ADC exposures;
  - (c) 75% on an individual exposure basis in respect of regulatory retail exposures; and
  - (d) 100% on an individual exposure basis in respect of any other exposures<sup>879</sup>.
- 7.13.72 **Granularity.** At the date of acquisition of the assets in the pool, no exposure to a single obligor may exceed 2% of the aggregate outstanding exposure value of the pool<sup>880</sup>. This figure may increase to 3% for conduits backed by corporate exposures in jurisdictions with structurally concentrated corporate loan markets subject to two conditions. Firstly, banks must obtain prior supervisory approval. Secondly, the seller or sponsor must retain subordinated tranche(s) providing credit enhancements which cover at least the first 10% of losses. Such first loss tranches are ineligible for STC treatment<sup>881</sup>.

## 7.14 The Standardised Approach to Securitisation Exposures

- 7.14.1 Unlike the position under Basel II, this approach is at the bottom of the hierarchy and can only be used if no other approach is available for securitisation exposures. It is therefore a default treatment.
- 7.14.2 The new standardised approach is a revision of the simplified supervisory formula approach that was consulted on in December 2012. Capital requirements under the standardised approach are calculated using the weighted-average standardised approach capital charge for the underlying exposures in the pool ( $K_{SA}$ ) and a factor - referred to as “w” - which is the ratio of the sum of the amount of all the underlying pool of exposures that are delinquent to the total amount of underlying exposures. The “w” factor represents an uplift to the capital charge for the underlying pool of exposures to reflect a deterioration in the credit quality of the pool, and is intended by the Basel Committee to enhance the risk sensitivity of the standardised approach.
- 7.14.3 The calibration of the standardised approach is intended to generate capital requirements that, overall, are slightly higher than that under the IRB approach, and roughly comparable to the external ratings-based approach. Re-securitisations attract a 50% capital surcharge over other securitisations under the standardised approach. Other approaches are not available for re-securitisations.

- 7.14.4 Under the standardised approach (SEC-SA) a bank is required to use the following inputs:
- (a) the capital charge determined under the standardised approach for the underlying exposures had they not been securitised ( $K_{SA}$ );
  - (b) the ratio of delinquent underlying exposures to total underlying exposures in the securitisation pool ( $w$ );
  - (c) the tranche attachment point ( $A$ ); and
  - (d) the tranche detachment point ( $D$ )<sup>882</sup>.
- 7.14.5 For this purpose, the “attachment point” is the minimum amount of pool-level losses at which any given tranche begins first to suffer losses. The “detachment point” is the amount of pool losses that completely wipes out the tranche. For this reason, in a securitisation, the detachment point of a subordinated tranche is the attachment point for the next immediately senior tranche. Given the tranching nature of all securitisation positions, it is necessary to use both  $A$  and  $D$  to obtain an accurate measurement of the level of risk in any given securitisation tranche. Where the only difference between exposures to a transaction is related to maturity, then  $A$  and  $D$  will be the same<sup>883</sup>.
- 7.14.6  $K_{SA}$  is defined as the weighted-average capital charge of the entire portfolio of underlying exposures, calculated under the standardised approach to credit risk (CRE 20), in relation to the sum of the exposure amounts of underlying exposures, multiplied by 8%<sup>884</sup>. Any eligible credit risk mitigation technique applicable either to individual exposures, or to the pool as a whole, should be taken into account, and thereby benefit the whole pool from a capital perspective.  $K_{SA}$  is a decimal between 0 and 1, so a weighted-average risk weight of 100% translates into a figure for  $K_{SA}$  of 0.08<sup>885</sup>. A risk-weight of 1250% means that  $K_{SA} = 1$ .

#### *SPV structures*

- 7.14.7 Where a traditional securitisation involves an SPV, all of the SPV’s exposures related to the pool are treated as exposures in the pool. This includes, but is not limited to, reserve accounts, cash collateral accounts, and claims under interest rate or currency swaps. For swaps (other than credit derivatives)  $K_{SA}$  must include in the numerator the positive current market value multiplied by the risk-weight of the swap provider multiplied by 8%. However, the swap is ignored in calculating the denominator as it does not provide any credit enhancement<sup>886</sup>.
- 7.14.8 A bank may exclude SPV exposures from the pool for regulatory capital purposes with supervisory consent provided that the risk either does not affect its securitisation exposure or the risk is immaterial<sup>887</sup>. Examples of techniques that may either significantly reduce or even eliminate the potential risk of default of a swap provider include cash collateralisation together with an obligation on the swap provider to post variation margin in the event of an increase in the market value of the swap, or the automatic substitution of the



swap provider with another swap provider at no cost to the SPV if the initial swap provider suffers a ratings downgrade<sup>888</sup>.

- 7.14.9 For funded synthetic securitisations, any proceeds from the issue of credit-linked notes, or other funded obligations of the SPV, that serve as collateral for repayment must, in principle, be included in the calculation of  $K_{SA}$  if the default risk of the collateral is tranching. This is not, however, necessary if the bank obtains supervisory consent to disregard the risk on the basis that it is immaterial<sup>889</sup>. Unfunded synthetic securitisations will not have an SPV as the credit risk is transferred by credit derivatives or equivalents to the protection provider.

#### *Specific provisions and non-refundable purchase price discounts*

- 7.14.10 If a bank sets aside a specific provision, or has a non-refundable purchase price discount, on an exposure or exposures in the pool  $K_{SA}$  is calculated disregarding such amounts and the bank must calculate  $K_{SA}$  based on the gross amount<sup>890</sup>. The reason is that such provisions or discounts are not fungible and do not reduce overall losses on the pool.

#### *Calculating “w”*

- 7.14.11 “w” was introduced above. It is the ratio of the sum of the notional amount of delinquent underlying exposures to the nominal amount of the underlying exposures<sup>891</sup>. The definition of “delinquent exposures” is underlying exposures that are: (i) 90 days or more past due, (ii) subject to bankruptcy or insolvency proceedings, (iii) in the process of foreclosure<sup>892</sup> on a mortgage, (iv) held as real estate owned, or (v) where the debt is in default (as defined in the securitisation documents)<sup>893</sup>.

#### *The capital calculation*

- 7.14.12 The main elements of the capital calculation under SEC-SA have already been introduced. We will now refer to  $K_A$  which is the capital requirement relevant to the attachment point.  $K_A$  is calculated as follows:

$$K_A = (1 - w) \times K_{SA} + 0.5w \quad 894$$

In circumstances where a bank cannot calculate “w” because it does not know the delinquency status of the entire pool, but this lack of knowledge applies to no more than 5% of all underlying exposures in the pool, then a modified definition of  $K_A$  applies:

$$K_A = \left( \frac{EAD_{subpool1 \text{ where } w \text{ known}}}{EAD_{Total}} \times K_{A \text{ subpool 1 where } w \text{ known}} \right) + \frac{EAD_{subpool 2 \text{ where } w \text{ unknown}}}{EAD_{Total}} \quad 895$$

- 7.14.13 If a bank cannot calculate “w” for 95% or more of the underlying exposures then the capital charge is 1250%<sup>896</sup> which, as we have seen, generates a  $K_{SA}$  decimal of 1 equivalent to a deduction from capital. Banks are therefore incentivised to obtain data to calculate “w”.

7.14.14 The actual capital calculation under the standardised approach is given below. In addition to the components we have already seen, the following factors must be determined:

$$a = - (1/(p \times K_A))$$

$$u = D - K_A$$

$$l = \max (A - K_A; 0)$$

“p” is a supervisory parameter which represents the relative capital surcharge for all securitisation exposures compared to the capital requirement for the underlying pool determined as follows:

$$p = \frac{(\text{capital requirement for all securitisation exposures under the given approach}) - (\text{capital requirements for the underlying exposures if held directly by a bank})}{(\text{capital requirements for the underlying exposures if held directly by a bank})}$$

p is equal to 1 for any securitisation exposure that is not a re-securitisation exposure<sup>897</sup>. For re-securitisation exposures p = 1.5<sup>898</sup>, reflecting a 50% uplift in capital charges for such exposures.

7.14.15 Taking all of the relevant factors into account, the capital charge determined under the standardised approach as follows:

$$K_{SSFA}(K_A) = \frac{e^{au} - e^{al}}{a(u-l)} \quad 899$$

7.14.16 The actual risk weights are as follows<sup>900</sup>:

- (a) if D is less than or equal to  $K_A$  the exposure receives a 1250% risk weight. This reflects the view that first loss positions must effectively be deducted from capital.
- (b) If A is equal or greater than  $K_A$  than the risk weight equals  $K_{SSFA}(K_A)$  multiplied by 12.5. The most senior tranche is accorded a risk weight equal to the formula above.
- (c) If A is less than  $K_A$  and D is greater than  $K_A$  then the capital charge is a weighted average of both 1250% and 12.5 times  $K_{SSFA}(K_A)$  applying the following formula:

$$RW = \left( 12.5 \times \frac{K_A - A}{D - A} \right) + \left( 12.5 \times K_{SSFA}(K_A) \right) \times \frac{D - K_A}{D - A}$$

7.14.17 The risk weight for market hedges, such as currency or interest rate swaps, must be inferred from a securitisation exposure that is *pari passu* to the swap (if it exists) and, if not, from the immediately junior tranche<sup>901</sup>.

7.14.18 Any risk weight derived from the above formula is subject to a floor of 15%<sup>902</sup>.

7.14.19 Where a bank is required to apply the SEC-SA approach to an unrated junior exposure in a transaction where the more senior tranches are rated, and therefore no rating can be inferred for the junior piece, the risk weight under the SEC-SA is subject to a floor equal to the risk weight of the immediately senior rated exposure<sup>903</sup>.

*STC securitisations*

- 7.14.20 The capital charge for STC securitisations is calculated in exactly the same way as is set out above with the following two modifications:
- (a)  $p = 0.5$  as opposed to  $1^{904}$  (representing a 50% reduction in capital charges); and
  - (b) the risk-weight floor is 10% for senior exposures and 15% for subordinated exposures<sup>905</sup>.

*Re-securitisation exposures*

- 7.14.21 Exactly the same approach is applied to re-securitisation exposures. The following modifications apply:
- (a)  $w = 0$  (delinquencies) for any exposure to a securitisation tranche in the underlying pool; and
  - (b)  $p = 1.5$  to reflect the 50% uplift due to the greater potential for loss on re-securitisations<sup>906</sup>.
- 7.14.22 Where only some of the exposures in the pool are securitisation exposures, and others are not, the pool is notionally sub-divided into two sub-pools with  $K_A$  calculated separately for each sub-pool using different “w” factors<sup>907</sup>. The resulting risk weight is subject to a 100% floor<sup>908</sup>, and the caps for securitisation exposures set out above do not apply<sup>909</sup>.

**7.15 External Ratings-based Approach**

- 7.15.1 This section describes the external ratings-based approach for those jurisdictions where use of external ratings is permitted. Ultimately, it derives from the Basel II securitisation standard, although with many changes. It is intended for those banks in jurisdictions where use of external ratings is permitted as a more risk sensitive approach than the standardised approach (*supra*).
- 7.15.2 Securitisation exposures for which an express or inferred rating can be obtained are risk-weighted at the exposure amount multiplied by the designated risk weight. Operational criteria apply<sup>910</sup>.
- 7.15.3 For the purposes of this section a rating may be “inferred” if the exposure is senior to a rated exposure for which there exists a credit rating provided by a recognised ratings agency.
- 7.15.4 Basel III applies primacy to short-term ratings. Where a short-term rating is available then it must be used (including an inferred rating based on a short-term rating). The following risk weights apply<sup>911</sup>.

External ratings-based approach risk weights for short-term ratings				
External rating	A-1/P-1	A-2/P-2	A-3/P-3	All other ratings
Risk weight	15%	50%	100%	1250%

7.15.5 In cases where a short-term rating does not exist, and cannot be inferred, then the bank may use long-term ratings to determine its capital charge. In this case, the capital charge depends on the external rating (or inferred rating, if possible), the seniority of the position, the tranche maturity and the thickness (for non-senior tranches)<sup>912</sup>. The risk weights under the external ratings-based approach are set out in the following table<sup>913</sup>:

External ratings-based approach risk weights for long-term ratings				
Rating	Senior tranche		Non-senior tranche	
	Tranche maturity ( $M_T$ )		Tranche maturity ( $M_T$ )	
	1 year	5 years	1 year	5 years
AAA	15%	20%	15%	70%
AA+	15%	30%	15%	90%
AA	25%	40%	30%	120%
AA-	30%	45%	40%	140%
A+	40%	50%	60%	160%
A	50%	65%	80%	180%
A-	60%	70%	120%	210%
BBB+	75%	90%	170%	260%
BBB	90%	105%	220%	310%
BBB-	120%	140%	330%	420%
BB+	140%	160%	470%	580%
BB	160%	180%	620%	760%
BB-	200%	225%	750%	860%
B+	250%	280%	900%	950%
B	310%	340%	1050%	1050%
B-	380%	420%	1130%	1130%
CCC+/CCC/CCC-	460%	505%	1250%	1250%
Below CCC-	1250%	1250%	1250%	1250%

7.15.6 Readers will note the much higher capital charges for non-senior tranches due to the higher losses on thin securitisation tranches in the financial crisis.

7.15.7 The risk weight assigned to a securitisation exposure is calculated as follows:

- (a) to account for tranche maturity, banks must use linear interpolation between the risk weight for one and five years. This is a method of curve

fitting using linear polynomials to determine the maturity of a securitisation position between 1 and 5 years; and

- (b) to account for tranche thickness, banks must calculate the risk-weight for non-senior tranches as follows: thickness (T) is measured as D - A i.e. the difference between the attachment and detachment points as discussed above<sup>914</sup>.

7.15.8 The risk weight is calculated as follows:

Risk weight = (risk weight from the table set out above after adjusting for maturity) x (1 - min (T, 50%))<sup>915</sup>

7.15.9 In the case of market risk hedges (e.g. currency or interest rate swaps) the risk weight is inferred from a securitisation exposure *pari passu* or junior to the hedge<sup>916</sup>. Under the external ratings-based approach there is a capital floor of 15% and any inferred risk weight can never be lower than the risk weight corresponding to a senior tranche of the same securitisation with the same rating and maturity<sup>917</sup>.

#### *Operational requirements*

7.15.10 In order to use the external ratings-based approach, the following operational criteria must also be satisfied. If they are not then the bank must use the fall-back SEC-SA approach (*supra*). The criteria may be summarised as follows:

- (a) the external rating must take into account and reflect the entire amount of credit risk exposure (e.g. both principal and interest);
- (b) the ratings agency (ECAI) must be recognised by the bank's national supervisor, and the key elements underlying the assessments must generally be publicly available on a non-selective basis free of charge<sup>918</sup>, and published in an accessible form. Ratings made available only to the parties to the transaction are not eligible;
- (c) ratings agencies must have demonstrated expertise in assessing securitisations, which may be evidenced by strong market acceptance;
- (d) the standardised approach rules for multiple ratings apply (see the earlier chapter on the *Standardised Approach to Credit Risk*);
- (e) credit risk mitigation must not be double-counted. Therefore, if the mitigant is already taken into account in the external rating then it may not, obviously, be recognised again. If the provider of credit protection is not rated, the exposure is treated as unrated;
- (f) where a credit risk mitigant solely protects a specific exposure within a given structure (e.g. an asset-backed security tranche) and this is reflected in the external assessment, the bank must treat the exposure as if it is unrated and then apply the credit risk mitigation treatment under either the standardised approach or the foundation IRB approach to the hedge; and

- (g) banks may not recognise external ratings where the assessment is partially based on unfunded support provided by the bank. By way of example, if a bank buys ABCP and provides an unfunded securitisation exposure to the programme (e.g. a liquidity facility), and that facility is material in determining the credit rating of the ABCP, the bank must treat the commercial paper as unrated<sup>919</sup>. Whilst this may be logical, it is unclear how the bank will know unless it has detailed knowledge of the rating methodology and the factors taken into account when determining the rating.

### *Inferred ratings*

- 7.15.11 We have earlier discussed inferred ratings, which play a significant role under the external ratings-based approach. Where a rating can be inferred, it must be used and the SEC-SA is treated as a fall-back only where a rating cannot be inferred. To infer a rating, the securitisation position from which the rating is inferred must rank either *pari passu* or be subordinated in all respects to the unrated securitisation exposure<sup>920</sup>. Any credit enhancements must be taken into account in assessing the relative subordination of the unrated exposure and the rated exposure. For example, if the rated exposure benefits from credit risk mitigation, but the unrated exposure does not, then it is not permitted to infer a rating from the rated tranche that does so benefit<sup>921</sup>. Secondly, the maturity of the rated exposure must be equal to, or longer than, the unrated exposure for which the rating is being inferred<sup>922</sup>. Thirdly, on an on-going basis, any inferred rating must be updated continuously to reflect any subordination of the unrated position, or changes in the external rating of the rated securitisation exposure<sup>923</sup>. Finally, the external rating must satisfy the securitisation operational criteria for recognition of ratings<sup>924</sup>. All of this seems common sense, although the requirements may present some challenges to banks, especially in respect of on-going monitoring of compliance of an external rating not obtained by the bank with the reference criteria. It is not immediately obvious how a bank could do this. Equally, whilst it is hard to quibble with the requirement that the reference securitisation obligation rank *pari passu* or junior to the unrated exposure, or have an equal or longer maturity, these requirements may present practical difficulties when it comes to assessing compliance where a bank has limited information.

### *STC securitisations*

- 7.15.12 We have already described the lower risk weights for STC securitisations under the standardised approach. We now proceed to consider the capital charges under the external ratings-based approach. The following rules apply<sup>925</sup>.
- 7.15.13 For exposures with short-term ratings (or where a short-term rating can be inferred - *supra*) the following risk weights apply<sup>926</sup> :

STC risk weights for short-term ratings				
External rating	A-1/P-1	A-2/P-2	A-3/P-3	All other ratings
Risk weight	10%	30%	60%	1250%

7.15.14 It follows that any rating below A-3/P-3 will result in a capital treatment equivalent to a deduction from capital.

7.15.15 For long-term ratings the following table applies to STC securitisations<sup>927</sup>:

STC risk weights for long-term ratings				
Rating	Senior tranche		Non-senior (thin) tranche	
	Tranche maturity ( $M_T$ )		Tranche maturity ( $M_T$ )	
	1 year	5 years	1 year	5 years
AAA	10%	10%	15%	40%
AA+	10%	15%	15%	55%
AA	15%	20%	15%	70%
AA-	15%	25%	25%	80%
A+	20%	30%	35%	95%
A	30%	40%	60%	135%
A-	35%	40%	95%	170%
BBB+	45%	55%	150%	225%
BBB	55%	65%	180%	255%
BBB-	70%	85%	270%	345%
BB+	120%	135%	405%	500%
BB	135%	155%	535%	655%
BB-	170%	195%	645%	740%
B+	225%	250%	810%	855%
B	280%	305%	945%	945%
B-	340%	380%	1015%	1015%
CCC+/CCC/CCC-	415%	455%	1250%	1250%
Below CCC-	1250%	1250%	1250%	1250%

7.15.16 The risk weights set out above are subject to the following floors. A 10% floor applies to senior tranches, and a 15% floor for all other tranches<sup>928</sup>.

## 7.16 The Internal Ratings-based Approach

7.16.1 The internal ratings-based approach is at the summit of the hierarchy for securitisation exposures where a bank is able to apply it. To do so the bank must be able to calculate the IRB capital charge for the underlying pool of exposures ( $K_{IRB}$ )<sup>929</sup>.

7.16.2 The following criteria are relevant to the IRB approach to securitisation exposures:

$K_{IRB}$  this is the capital charge under the relevant IRB approach (foundation or advanced) applicable to the securitised pool of exposures and is essential to calculating the IRB capital charge for securitised exposures.

A is the tranche attachment point.

D is the detachment point.

Where the only difference relates to maturity, then A and D are the same<sup>930</sup>.

#### *Definition of $K_{IRB}$*

- 7.16.3  $K_{IRB}$  is the ratio of the following, expressed in decimal form (so a capital charge of 15% of the pool is 0.15)<sup>931</sup>:
- (a) the IRB capital requirement for the underlying pool (including expected loss, and dilution risk, where applicable); to
  - (b) the exposure amount of the pool (e.g. the sum of drawn amounts related to securitised exposures plus the exposure-at-default associated with any undrawn commitments)<sup>932</sup>.
- 7.16.4 In calculating  $K_{IRB}$  for mixed pools,  $K_{IRB}$  must be calculated as if the exposures in the pool were held directly by the bank, reflecting any applicable credit risk mitigation<sup>933</sup>.

#### *SPV structures*

- 7.16.5 Where there is an SPV in the securitisation structure (e.g. traditional securitisations) all of the SPV's exposures must be treated as exposures in the pool. This may include reserve accounts, cash collateral accounts, swap accounts, etc. However, this is subject to the following exception. If the bank can demonstrate that the risk of the SPV's exposures is either immaterial, or does not affect the bank's securitisation exposure, then national supervisors may permit banks to disregard such exposures<sup>934</sup>.
- 7.16.6 For funded synthetic securitisations, any proceeds of the issue of credit-linked notes or other funded obligations of an SPV that serve as collateral for the repayment of the securitisation exposure in question, are included in the calculation of the capital charge for the exposures had they not been securitised ( $K_{IRB}$ ) unless the exposure is immaterial and the bank's national supervisor consents<sup>935</sup>.

#### *Purchased receivables*

- 7.16.7 The standard IRB treatment of purchased receivables applies to securitisation exposures:
- (a) which are retail exposures where the bank is unable to rely primarily on internal data; and
  - (b) for all other exposures, if it would be an undue burden on the bank to assess the default risk of obligors individually<sup>936</sup>.
- 7.16.8 Where the top-down approach to purchased receivables is used under the IRB approach to securitisation exposures then certain modifications are made. Supervisors may exclude the application of the top-down approach



“depending on the bank’s compliance with minimum requirements”<sup>937</sup>. This is unclear. If it means that the use of the top-down approach is dependent on compliance with the relevant requirements then this is unobjectionable. If, however, there is a general discretionary power to deny use of the top-down approach in respect of securitised exposures where the relevant criteria are satisfied then it is not obvious why this should be the case.

7.16.9 The following specific changes apply to the top-down approach when applying it to securitisation exposures:

- (a) the requirement for a bank to have a claim on all proceeds of the pool, or a pro-rata share, does not apply. Instead, the bank must have a claim on all proceeds from the pool of securitised exposures that have been allocated to the bank’s exposure in accordance with the terms of the securitisation documentation;
- (b) the purchasing bank means the bank calculating  $K_{IRB}$ ;
- (c) references to the “bank” mean “the bank estimating probability of default, loss-given-default (LGD) or expected loss for the securitised exposures”; and
- (d) if the bank calculating  $K_{IRB}$  cannot meet the specified IRB minimum requirements, then it may apply the IRB approach if another party to the securitisation does so who is acting “for and in the interests of” the investors<sup>938</sup>.

7.16.10 These all seem logical changes to make the IRB approach for purchased receivables operational in a securitisation context.

*Specific provisions, etc.*

7.16.11 If a bank sets aside a specific provision, or has a non-refundable purchase price discount on an exposure in the pool,  $K_{IRB}$  must be calculated using the gross exposure<sup>939</sup>. As has been seen in the context of the standardised approach, such an adjustment is also logical.

*Dilution risk*

7.16.12 Banks must determine a capital charge for dilution risk (e.g. the risk of charge-backs, customer disputes, etc.) unless it is immaterial and the bank’s supervisor gives consent to disregard it<sup>940</sup>.

7.16.13 If default risk and dilution risk are treated in an aggregate manner (e.g. an identical reserve or overcollateralisation covers both risks) then the bank is required to separately calculate  $K_{IRB}$  for default risk and  $K_{IRB}$  for dilution risk and then combine both into a single  $K_{IRB}$  when applying the IRB frameworks to securitisation exposures<sup>941</sup>. An example of such a calculation is given in the Basel III consolidated text<sup>942</sup>.

7.16.14 Where there are separate waterfalls for credit risk and dilution risk a bank must consult with its national supervisor to determine how the capital calculation must be performed<sup>943</sup>.

*Definitions of regulatory parameters for calculating the IRB capital charge*

- 7.16.15 The IRB approach to securitisation exposures is based on certain parameters, in addition to  $K_{IRB}$  and other standard IRB inputs. These are as follows: the attachment point (A), the detachment point (D) and the supervisory parameter  $p$ . These were referred to in our discussion of the standardised approach and the reader is referred to that section for explanations of A and D. “ $p$ ” is simply a regulatory multiplier to scale up the capital charge for securitisation positions.
- 7.16.16 The attachment point (A) is defined, under the IRB approach, as “the threshold at which losses within the underlying pool would first be allocated to the securitisation exposure”<sup>944</sup>. A is a decimal between 0 and 1 and is calculated as the greater of the following:
- (a) zero; and
  - (b) the ratio of: (a) the outstanding balance of all underlying assets in the securitisation minus the outstanding balance of all tranches that rank senior or *pari passu* to the tranche that contains the securitisation exposure held by the bank to (b) the outstanding balance of all underlying assets in the securitisation<sup>945</sup>.
  - (c) As seen above, the purpose is to identify the point at which the tranche to which the bank’s exposure corresponds first begins to suffer losses.
- 7.16.17 The detachment point (D) “represents the threshold at which losses within the underlying pool result in a total loss of principal for the tranche in which a securitisation exposure resides”<sup>946</sup>. It is a figure between 0 and 1, and is the greater of the following:
- (a) zero; and
  - (b) the ratio of (a) the outstanding balance of all underlying assets in the securitisation minus the outstanding balance of all tranches that rank senior to the tranche that contains the securitisation exposure of the bank to (b) the outstanding balance of all underlying assets in the securitisation<sup>947</sup>.
- 7.16.18 When calculating A and D overcollateralisation and funded reserve accounts must be recognised as tranches in their own right. However, unfunded reserve accounts (e.g. unrealised excess spread) and assets that do not provide credit enhancements (e.g. pure liquidity facilities or swaps) are not taken into account in calculating A and D<sup>948</sup>.
- 7.16.19 The following parameters are used in calculating the IRB capital charges:
- (a) the “ $p$ ” parameter floor is 0.3;
  - (b)  $N$  is the effective number of loans in the underlying pool (see below);
  - (c)  $K_{IRB}$  is the capital charge for the underlying pool calculated under the IRB approach;

(d) LGD is the exposure-weighted average loss-given-default of the underlying pool; and

(e)  $M_T$  is the maturity of a tranche<sup>949</sup>.

7.16.20 The supervisory parameters A, B, C, D and E are determined in accordance with the following table<sup>950</sup>.

Table for supervisory parameters A, B, C, D and E		A	B	C	D	E
Wholesale	Senior, granular (N $\geq$ /25)	0	3.56	-1.85	0.55	0.07
	Senior, granular (N<25)	0.11	2.61	-2.91	0.68	0.07
	Non-senior, granular (N $\geq$ /25)	0.16	2.87	-1.03	0.21	0.07
	Non-senior, non granular (N<25)	0.22	2.35	-2.46	0.48	0.07
Retail	Senior	0	0	-7.48	0.71	0.24
	Non-senior	0	0	-5.78	0.55	0.27

7.16.21 Based on the supervisory parameters set out in the above table “p” is calculated as follows:

$$p = \max\left[0.3, \left(A + \frac{B}{N} + (C \times K_{IRB}) + (D \times LGD) + (E \times M_T)\right)\right]^{951}$$

7.16.22 If an IRB pool contains both retail and non-retail exposures then the pool must be separated into two notional pools, one retail sub-pool and one wholesale sub-pool, and N,  $K_{IRB}$ , and LGD are determined for each notional sub-pool. Subsequently, a weighted average p-parameter for the transaction is calculated on the basis of the two sub-pools and the nominal size of exposures in each sub-pool<sup>952</sup>.

7.16.23 In the case of so-called “mixed pools” where a bank can calculate  $K_{IRB}$  on a percentage of exposures in the pool, the determination of “p” must be based solely on the IRB underlying assets, with assets to which the standardised approach is applied disregarded<sup>953</sup>.

#### Effective number of exposures

7.16.24 The effective number of exposures (N) is calculated as follows:

$$N = \frac{(\sum_i EAD_i)^2}{\sum_i EAD_i^2}$$

where  $EAD_i$  represents the exposure-at-default associated with the  $i^{\text{th}}$  exposure in the pool<sup>954</sup>.

7.16.25 The exposure-weighted average LGD is calculated as follows:

$LGD_i$  is the average LGD associated with all exposures to the  $i^{\text{th}}$  obligor<sup>955</sup>.

7.16.26 The LGD is calculated as follows:

$$LGD = \frac{\sum_i LGD_i \times EAD_i}{\sum_i EAD_i} \quad 956$$

7.16.27 If default and dilution risks for purchased receivables are treated in an aggregate manner (e.g. a single reserve or over-collateralisation account covers both) the LGD is a weighted average of the LGD for default risk and the 100% LGD for dilution risk<sup>957</sup>.

7.16.28 A simplified method is available for calculating the effective number of exposures and the exposure-weighted average LGD. It is a prerequisite for applying this approach that the portfolio share associated with the largest exposure ( $C_1$ ) is no more than 3% of the underlying pool. In the formula below  $C_m$  is the share of the pool corresponding to the sum of the largest  $m$  exposures determined by the bank using its internal calculations.

7.16.29 In this case banks may determine:

$$N = \left( (C_1 \times C_m) + \frac{(C_m - C_1) \times \max(1 - m \times C_1, 0)}{m - 1} \right)^{-1}$$

7.16.30 If only  $C_1$  is known to the bank then the  $LGD = 0.5$  and  $N = \frac{1}{C_1}$ <sup>958</sup>.

#### *Risk weight calculations*

7.16.31 Using the above factors, and the normal IRB credit risk factors, the capital charge under the IRB approach is determined as follows:

$$K_{IRB}$$

$K_{SSFA(K_{IRB})}$  is the capital charge per unit of securitisation exposure based on the following parameters:  $e$ ,  $a$ ,  $u$  and  $l$ . For these purposes:

$$e = 2.71828;$$

$$a = - (1/p \times K_{IRB})$$

$$u = D - K_{IRB};$$

$$l = \max(0, A - K_{IRB})^{959}; \text{ and}$$

$$K_{SSFA(K_{IRB})} = \frac{e^{au} - e^{al}}{a(u-l)} \quad 960$$

7.16.32 Taking all of this into account the risk weights for securitisation exposures under the IRB approach are as follows:

- (a) if  $D$  is less than or equal to  $K_{IRB}$  then the risk weight is 1250% (equivalent to a deduction from capital);
- (b) if  $A$  is equal to or greater than  $K_{IRB}$  the risk weight (expressed as a percentage) equals  $K_{SSFA(K_{IRB})}$  multiplied by 12.5; and
- (c) for all other positions (i.e.  $A < K_{IRB}$  and  $D > K_{IRB}$ ) the risk weight is determined in accordance with the following formula:

$$RW = \frac{12.5 \times (K_{IRB} - A)}{D - A} + \frac{12.5 \times K_{SSFA(K_{IRB})} \times (D - K_{IRB})}{D - A} \quad 961$$

- 7.16.33 The risk weight for currency and interest rate swaps must be inferred from a securitisation exposure *pari passu* or junior to it<sup>962</sup>.
- 7.16.34 There is a floor on all risk weights determined in accordance with the above of 15%<sup>963</sup> (7% under Basel II).

#### STC securitisations

- 7.16.35 As mentioned before, a preferential risk weight applies to STC securitisations, although the calculation is the same (with revised parameters). The following rules apply:
- (a)  $p$  is subject to a floor of 0.3;
  - (b)  $N$  must be calculated as described above (although a different table for the supervisory parameters A, B, C, D and E applies when calculating  $N$ ). The table is set out below;
  - (c)  $K_{IRB}$  is calculated in exactly the same way (i.e. it is the IRB capital charge for the underlying pool, assuming it had not been securitised);
  - (d) LGD is the exposure-weighted average loss-given-default of the underlying pool (not individual exposures) calculated as set out above; and
  - (e) maturity ( $M_T$ ) is the maturity of the tranche<sup>964</sup>.
- 7.16.36 The table for calculating supervisory parameters for determining  $N$  is as follows for STC securitisations is set out below.

Supervisory parameters A, B, C, D and E		A	B	C	D	E
Wholesale	Senior, granular ( $N \geq 25$ )	0	3.56	-1.85	0.55	0.07
	Senior, non granular ( $N < 25$ )	0.11	2.61	-2.91	0.68	0.07
	Non-senior granular ( $N \geq 25$ )	0.16	2.87	-1.03	0.21	0.07
	Non-senior, non-granular ( $N < 25$ )	0.22	2.35	-2.46	0.48	0.07

Supervisory parameters A, B, C, D and E		A	B	C	D	E
Retail	Senior	0	0	-7.48	0.71	0.24
	Non-senior	0	0	-5.78	0.55	0.27

7.16.37 There is a floor for STC exposures of 10% for senior tranches and 15% for subordinated tranches<sup>965</sup>.

## 7.17 The Internal-assessment Approach to ABCP programmes (SEC-IAA)

7.17.1 The internal assessment approach is available, subject to prior supervisory approval, for securitisation exposures to ABCP programmes (e.g. liquidity facilities and credit enhancements). It is a prerequisite for using the SEC-IAA approach to such exposures that the bank has an IRB approved model, although this need not relate to the securitised exposures. For example, if a bank has an approved IRB model for retail exposures, it may apply the SEC-IAA to corporate exposures to a conduit. The operational requirements must, of course, be satisfied. Under SEC-IAA internal assessments of exposures to ABCP programmes must be mapped to the equivalent ratings of a selected ratings agency (ECAI). Those ratings are then used to determine the capital charge<sup>966</sup>. SEC-IAA is therefore only ever relevant to unrated exposures where the internal ratings-based approach cannot be used.

7.17.2 Basel III sets out the following operational requirements for using the SEC-IAA approach:

- (a) the ABCP programme paper must have an external rating. If it does not SEC-IAA cannot be used;
- (b) any internal assessment of the credit quality of a securitisation tranche must be based on ratings agency criteria for the asset type covered. Such assets must be (at purchase) at least investment grade. Also, the internal assessment must be used in the bank's internal risk management processes, including management information and economic capital systems. All of the relevant requirements for the IRB framework must be met, even though the bank need not have an IRB permission to apply the IRB approach to the relevant asset class;
- (c) the relevant supervisor must be satisfied that the chosen ratings agency(ies) meets the criteria for the issuance of ratings under the standardised approach. Further, the bank's national supervisor must be satisfied with the ratings methodology used in the process. This reflects the hybrid standardised/IRB approach used under SEC-IAA;
- (d) banks are required to satisfy their relevant supervisor that internal estimates correspond to the chosen ratings agency standards (i.e. prior supervisory consent is required). For example, the Basel III text states that supervisors may "if warranted, disallow on a full or partial basis any seller-provided recourse guarantees or excess spread, or any other first-loss credit enhancements that provide limited protection to the bank"<sup>967</sup>;

- (e) the bank's internal assessment process must identify grades of risk, and must correspond to rating agency grades, so supervisors can assess the correspondence of internal assessments to rating agency grades;
- (f) the bank's internal assessment process, including, in particular, the stress factors for credit enhancements, must be as conservative as that applied by major ratings agencies rating the ABCP programme's commercial paper. Specific rules apply to the use of individual ratings agency ratings;
- (g) regular reviews of the internal ratings process must be carried out either by internal or external auditors, an external ratings agency, or the bank's own credit review or risk management function;
- (h) the bank must track the performance of its internal assessments over time, and make adjustments if necessary;
- (i) the ABCP programme must have credit and investment guidelines, including underwriting standards;
- (j) a credit analysis of the seller's risk profile is required to be performed, and must consider past and expected future financial performance, the current market position, expected future competitiveness, leverage, cash flow and interest coverage amongst other factors;
- (k) the ABCP programme's underwriting policy must have minimum asset eligibility criteria including: (a) excluding the purchase of assets significantly past due, (b) limiting excess concentration to individual obligors or geographical areas, and (c) limiting the maturity of the assets purchased;
- (l) the ABCP programme must have collection processes that consider the operational capability and credit quality of the servicer. The programme should mitigate, to the extent possible, seller/servicer risks;
- (m) the estimate of loss on an asset pool must take into account all sources of potential risk, including credit and dilution risk; and
- (n) the ABCP programme incorporates structural features into the purchase of assets<sup>98</sup>.

#### *Risk weights under the SEC-IAA approach*

7.17.3 The risk weights (and therefore capital charges) are assigned based on the inferred rating applicable to the external ratings-based approach<sup>99</sup>. If a bank cannot use the SEC-IAA approach then it must use the standardised approach as if it could use the IRB approach this would be required under the securitisation hierarchy.

#### *Supervisory judgment*

7.17.4 If the relevant national supervisor considers a bank's internal assessments not to be adequate, then it may preclude reliance on the SEC-IAA approach to ABCP exposures, both existing and newly originated, until any deficiencies are

remediated<sup>970</sup>. This potentially penal capital consequence may act as a significant deterrent against breaches of the SEC-IAA requirements, although as there are many uncertainties in the practical application of the requirements, this may be a source of risk to banks.

## 7.18 Securitisations of Non-performing Loans

7.18.1 Specific rules apply to securitisations of non-performing loans (NPLs). An NPL securitisation is a securitisation where the underlying pool's "w" (see above) is equal to 90% or higher (i.e. the ratio of non-performing loans is at least 90%) at the origination cut-off date, and any subsequent date at which the pool is replenished, or assets are removed from the pool. NPL securitisations exclude pools containing securitisation exposures (i.e. re-securitisations)<sup>971</sup>.

7.18.2 National supervisors may specify a stricter definition of NPL securitisations (as elsewhere in the Basel III standard which represents only minimum harmonisation). Examples include a higher level of "w" than 90% or a requirement that non-delinquent exposures meet specified criteria<sup>972</sup>.

### *Risk weights*

7.18.3 National supervisors must scrutinise NPL securitisations to avoid regulatory arbitrage, and, in particular, transactions entered into with the main purpose of reducing capital charges below the 100% capital requirement for securitised NPL exposures<sup>973</sup>.

7.18.4 The risk weight for NPL securitisations is floored at 100%<sup>974</sup>, although under the IRB, or look-through approach (for purchased receivables), the actual risk weight may be higher.

7.18.5 Where (under the relevant hierarchy of treatments) a bank must use either the standardised approach or the IRB approach, then a bank may apply a 100% risk weight to the senior tranche of an NPL securitisation under the following conditions:

- (a) the securitisation is a traditional securitisation; and
- (b) the sum of non-refundable purchase price discounts (NRPPD) is equal or higher than 50% of the outstanding balance of the pool of exposures<sup>975</sup>.

7.18.6 NRPPD is equal to the difference between the outstanding balance of exposures in the pool and the price at which these exposures are sold<sup>976</sup>. The maximum capital cap applies to originators and sponsors of NPL securitisations provided the originator uses the IRB approach to any exposure to the NPL securitisation<sup>977</sup>.



## 8. UNSETTLED TRANSACTIONS AND FAILED TRADES

Both unsettled transactions and failed trades give rise to counterparty credit risk. However, they are not treated under the general CCR framework. Instead a bespoke treatment applies which will be described in this very short chapter.

### 8.1 Failed Trades

- 8.1.1 A failed trade is a transaction where both legs of the transaction (i.e. delivery and payment) are required to take place at the same time (delivery versus payment or DvP), but where one leg remains outstanding (i.e. there has been a contractual default). The requirement also applies to payment-versus-payment transactions (e.g. the sale of pounds sterling for euro). The Basel framework does not treat cryptocurrencies as a payment.
- 8.1.2 A default by a counterparty to settle a trade is not treated as such under the standardised or IRB frameworks for credit risk<sup>978</sup>. Such transitory defaults are in practice very common, and do not necessarily indicate poor creditworthiness, due to issues like system delays, an unavailability of securities for purchase in the market or a failure of a counterparty to make delivery to the bank. However, if a default persists for five business days or more then the following treatment applies<sup>979</sup>.
- 8.1.3 The rules apply to all transactions in securities, FX and commodities that give rise to a risk of delayed settlement or delivery. The rules cover transactions entered into through clearing houses and CCPs. However, transactions otherwise subject to the CCR framework (i.e. OTC derivatives, exchange-traded derivatives, long-settlement transactions and securities financing transactions) are excluded<sup>980</sup>. The relationship between long-settlement transactions under the CCR framework and free deliveries, referred to below, is not clear. Logically, a long-settlement position would be a transaction where *both* legs are required to settle beyond the normal settlement period for the instrument in question, whereas a free delivery occurs in case of a contractual mismatch in the two legs of a transaction.
- 8.1.4 If both legs of a DvP transaction do not appear on the balance sheet at the same time (i.e. settlement day accounting) then a 100% CCF applies to the unaccounted for mismatch where a trade falls<sup>981</sup>. This is to avoid the accounting treatment driving the regulatory treatment.

#### *System-wide failures of settlement*

- 8.1.5 Where there is a system-wide failure of a settlement, clearing system or CCP then a national supervisor may waive capital requirements until the situation is rectified<sup>982</sup>. This presumably only refers to the default and not all capital requirements.

*Capital charge for failed trades*

- 8.1.6 As has been seen neither the standardised nor IRB frameworks for credit risk apply in their normal way. Nor does the CCR framework apply. Instead the normal capital charges generated under the standardised or IRB framework are scaled up in accordance with the following table<sup>983</sup>.

Number of business days after the agreed settlement date	Risk multiplier
From 5 to 15	8%
From 16 to 30	50%
From 31 to 45	75%
From 46	100%

- 8.1.7 If a bank recognises a loss by making a specific provision in respect of such transactions then the provision will be deducted from the profit and loss account. In accordance with the general approach to deductions from capital, transactions that are written off through making a specific provision should not be subject, *pro tanto*, to a capital charge.

**8.2 Free Deliveries**

- 8.2.1 A free delivery occurs where a bank transfers title to securities without receiving the payment leg at the same time i.e. there is a delay between delivery of the securities and payment, so the bank takes credit risk on its counterparty defaulting. It also occurs where a bank makes a payment today for delivery of securities at a later date. In this case the bank is exposed to the risk of its counterparty not delivering the securities at the contractual performance date due to a default.
- 8.2.2 All transactions where the price or the securities are not received on the same business day as the securities are delivered or the price is paid are treated as free deliveries<sup>984</sup>. For cross-time zone payments this means that the payments are on the same day based on the relevant local time where the second leg of the transaction is performed<sup>985</sup>. Non-DVP transactions where settlement is nevertheless required on the same business day are not free deliveries.
- 8.2.3 If the bank uses the standardised approach to credit risk then it uses the standardised risk weights to determine its capital charge for the relevant counterparty<sup>986</sup>. Banks using the IRB approach unsurprisingly use IRB risk weights. However, if the bank has no other banking book exposures to the particular counterparty on which to generate an IRB risk weight it may instead use an external rating to generate a PD figure<sup>987</sup>.
- 8.2.4 An alternative to the above treatment, where exposures arising out of free deliveries are not material, is to apply a 100% cross-the-board risk weight to avoid the burden of performing a full credit assessment<sup>988</sup>.

*Default on the second delivery or payment leg*

- 8.2.5 A default in making a payment or delivery is not treated as a default under the normal standardised or IRB capital framework for credit risk<sup>989</sup>. However, if five business days or more have passed since the contractual delivery or payment date then Basel III mandates a 1250% risk weight, equivalent to a deduction from capital. This is because of the very high risk of the bank suffering a credit risk loss. This applies until delivery or payment are actually made<sup>990</sup>.

## 9. EQUITY INVESTMENTS IN FUNDS

This chapter describes the capital treatment for a bank's equity investments in funds. This is not a separate capital framework but a menu of approaches as to how the standardised and IRB approaches to credit risk must be applied to such exposures, with a penal fall-back approach where they cannot be applied. There is a prescribed hierarchy to the approaches. Banks that can apply the look-through approach must do so. If they cannot then the mandate-based approach applies. If a bank cannot apply either the look-through or mandate-based approaches then the fall-back approach must be used<sup>991</sup>. Exposures to funds that are deducted from capital are excluded from the treatment described in this chapter<sup>992</sup>.

### 9.1 Exclusions

9.1.1 The following equity exposures in funds are disregarded:

- (a) equity holdings in entities qualifying for a 0% risk weight under the standardised approach to credit risk. This included PSEs that qualify for a 0% risk weight<sup>993</sup>; and
- (b) at supervisory discretion, exposures to entities established under legislated programmes that provide significant subsidies, and are subject to some kind of governmental oversight and restrictions on the investments they can make. There is a cap in such exempt investments of 10% of the bank's total regulatory capital<sup>994</sup>.

### 9.2 The Look-through Approach (LTA)

9.2.1 This is the most risk sensitive framework which is why it must be used where possible. Under the LTA banks break down all their fund exposures as notional exposures to all of the equities in the fund and then apply the applicable approach (standardised or IRB) to those exposures. This is described in more detail below.

9.2.2 Basel III imposes the following two requirements to use the LTA:

- (a) the bank must have sufficient and frequent information to identify the underlying exposures of the fund; and
- (b) the information is verified by an independent third party<sup>995</sup>.

9.2.3 The bank is not required itself to confirm the underlying exposures as in most cases it would be unable to do this.

9.2.4 The first requirement set out above means that the frequency of the financial reporting of the fund must be the same as, or more frequent than, that of the bank's. Additionally, the granularity of the reporting must be sufficient for the bank to be able to apply the LTA to the fund's exposures<sup>996</sup>. Basically, this means that the bank must have full disclosure of the fund's actual investments on an ongoing basis.

- 9.2.5 The second requirement will be satisfied if the underlying exposures are verified by an independent third party. Examples given include the depositary, the custodian bank or (where relevant) the management company<sup>997</sup>. An external audit is not required<sup>998</sup>.
- 9.2.6 Under the LTA the bank calculates risk weights for all underlying exposures of the fund as if it directly held those exposures. This includes any exposures the fund has to derivatives used by the fund<sup>999</sup> e.g. interest rate or currency swaps. A scaling factor of 1.5 applies to credit value adjustments (CVAs) calculated under the market risk framework, so the capita charge for such exposures only is subject to a 50% uplift from that applicable if the bank directly held those exposures on its balance sheet<sup>1000</sup>. The CVA framework is described in chapter 13.
- 9.2.7 If a bank is unable to calculate the risk weights itself under the LTA it may rely on third party calculations. In this case the risk weights are subject to a 20% uplift<sup>1001</sup> as the bank is relying on a third party to set its capital requirements. This means that if the normal risk weight is 20% then the risk weight is increased to 24%<sup>1002</sup>.
- 9.2.8 A leverage adjustment applies (see below).

### 9.3 The Mandate-based Approach (MBA)

- 9.3.1 If a bank cannot use the LTA then it must, if it can, use the MBA. The underlying idea is that if the bank doesn't know what exposures are included in the fund then it can use the fund's investment mandate as a proxy on the assumption that the fund invests to the greatest degree allowed under the fund documentation in riskier assets. Banks are not expected to assume that the fund will include unauthorised investments. Where the investment mandate is set out in legislation or regulatory rules then these may likewise be used.
- 9.3.2 If the fund publishes some, but incomplete, information, then this may be taken into account as well<sup>1003</sup>.
- 9.3.3 The actual capital calculation under the MBA is the sum of the following three elements determined as follows:
- (a) balance sheet exposures (i.e. investments by the fund) are risk weighted assuming the fund invests to the maximum extent possible in those assets attracting the highest capital requirement. Where there is more than one possible risk weight the highest is used<sup>1004</sup>;
  - (b) derivatives receive a risk weight based on the notional amount of the derivative<sup>1005</sup>; and
  - (c) CCR exposure on derivative positions is calculated under the CCR standardised approach (see chapter 10). If the PFE cannot be known then it is set at 15% of the value of the notional. A 1.5 scaling factor applies to CVA risk as is also the case under the LTA<sup>1006</sup>.
- 9.3.4 A leverage adjustment also applies.

## 9.4 Capital Calculation under LTA or MBA

- 9.4.1 Under both the LTA and MBA the bank calculates the appropriate risk weighted assets of the fund. Then the total assets of the fund are divided by the total risk-weighted assets to give the average risk weight of the fund (Avg RWfund)<sup>1007</sup>.
- 9.4.2 The capital calculation is then the product of the average risk weight for the fund, the size of the equity investment by the bank and a metric based on the fund's leverage. The leverage adjustment is a measure of the underlying riskiness of the portfolio<sup>1008</sup>.
- 9.4.3 Formally, the capital calculation can be set out as follows:

$$RWA_{investment} = Avg\ RW_{fund} * leverage * equity\ investment^{1009}$$

## 9.5 Fall-back Approach

- 9.5.1 Where neither of the preceding approaches can be used (e.g. due to information limitations) then there is a fall-back approach (FBA). This is a cross-the-board 1250% risk weight equivalent to a deduction from capital for the bank's equity investment in the fund. This is clearly likely to incentivise banks to obtain the required information, and therefore for funds to provide it where they seek to secure bank investments.
- 9.5.2 There is no leverage adjustment as a 1250% risk weight cannot be increased<sup>1010</sup>.

## 9.6 Funds-of-Funds

- 9.6.1 Funds may invest in other funds. This necessitates a capital approach to investments in funds-of-funds made by banks.
- 9.6.2 If a bank invests in one fund (fund A) and that fund invests in one or more funds (fund B), the bank can use either the LTA or MBA provided the bank meets the necessary requirements (as to which see above). For three or more tiers of funds then only the LTA may be used. In any case where the requirements for the LTA and MBA (if available) cannot be met the fall-back approach with its penal capital charge applies<sup>1011</sup>.

## 9.7 Partial Use of an Approach

- 9.7.1 A bank may combine the three approaches. For example, it may use the LTA for those exposures in respect of which it can meet the relevant standards, and the MBA for others, only using the FBA where it is unable to use either of the other approaches<sup>1012</sup>. This is sensible as otherwise if a bank could not use one approach for *all* of its equity exposures to funds, then the totality of all such exposures would be subject to a 1250% risk weight.

## 10. COUNTERPARTY CREDIT RISK

### 10.1 Introduction

10.1.1 Counterparty credit risk (CCR) is the risk that the counterparty to a transaction could default before the final settlement of the transaction's cash flows. An economic loss would occur if the transactions or portfolio of transactions with the counterparty has positive economic value at the time of default. Unlike a firm's exposure to credit risk through a loan, where the exposure to credit risk is unilateral and only the lending bank faces the risk of loss, CCR creates a bilateral risk of loss as the market value of a transaction can be positive or negative on either side of the transaction, and may change over time with the movement of underlying market factors<sup>1013</sup>. Bilateral risk is explained further below through examples.

10.1.2 CCR may arise on both trading book and banking book transactions. For example, derivative contracts are more likely to be encountered in the trading book than the banking book, but need not be eligible for inclusion in the trading book as a currency swap or an option that is entered into to hedge an exposure arising in the banking book must be booked in the banking book. The same applies to long-settlement positions or repo-style transactions not entered into for trading purposes.

10.1.3 Bilateral risk will now be explained further through the following examples:

- (a) If a bank makes a loan, then the only party that can suffer a loss is the lending bank, as even if the bank subsequently fails, the borrower will not be affected (usually, it will be required to repay the insolvency official as per the contractual repayment schedule). However, if a bank makes a collateralised loan then the bank is exposed to the risk that the borrower defaults and the value of the collateral is insufficient to cover the loss on the loan. The borrower is exposed to the risk that the bank defaults and does not return the collateral. Even if the borrower has a legal right to offset the amount it owes against the value of the collateral, the borrower will still suffer a loss if the value of the collateral is higher than the value of the loan when the bank defaults<sup>1014</sup>.
- (b) If a bank borrows cash from a counterparty and posts collateral (or enters into an economically equivalent transaction, such as a repo) then the bank is exposed to the risk that the counterparty defaults and does not return the collateral. The risk for the counterparty is that the bank defaults and the proceeds from realising the collateral are insufficient to cover the loss on the loan<sup>1015</sup>.
- (c) A bank may borrow securities from a counterparty and post cash as collateral. In this case the bank is exposed to the risk that its counterparty defaults and does not return the cash posted as collateral. The risk for the counterparty is that the bank defaults and the collateral provided is insufficient to cover the loss on the securities borrowed<sup>1016</sup>.

- (d) If a bank enters into a derivatives transaction with a counterparty (e.g. a swap or purchases an option) then both parties are exposed to risk. The bank incurs the risk of the counterparty defaulting in circumstances where the derivative has a positive value for the bank. The counterparty is exposed to the risk that the bank defaults when the derivative has a positive value for the counterparty<sup>1017</sup>.
- 10.1.4 The CCR rules address the risk of loss to banks from counterparty default. The risk of gains or losses on the changing market value of derivative transactions falls is addressed by the market risk framework described in chapter 11.
- 10.1.5 Not all transactions that give rise to bilateral risk result in a CCR capital charge. Basel III only requires a capital charge to be calculated for CCR on the following four categories of transaction:
- (a) OTC derivatives;
  - (b) exchange-traded derivatives;
  - (c) long-settlement positions; and
  - (d) securities financing transactions<sup>1018</sup>.
- 10.1.6 The four classes of transactions generally exhibit the following characteristics:
- (a) the transactions generate a current exposure or market value;
  - (b) the transactions have an associated random future market value based on market variables;
  - (c) the transactions generate an exchange of payments or an exchange of a financial instrument or commodity against payment; and
  - (d) the transactions are undertaken with an identified counterparty against which a unique probability of default can be determined<sup>1019</sup>.
- 10.1.7 Other common characteristics are:
- (a) collateral may be used to mitigate risks and may be inherent in certain transactions (e.g. repos);
  - (b) short-term financing may be a primary objective in that the transactions mostly consist of an exchange of one asset for another asset (cash or securities) for a relatively short period of time, usually for the purpose of financing;
  - (c) netting may mitigate the risks;
  - (d) positions are frequently valued; and
  - (e) re-margining may be used<sup>1020</sup>.



- 10.1.8 Although the latter techniques are common for transactions subject to the CCR rules, it is not necessary that they are used in any transaction in respect of which a bank must calculate a CCR capital charge.
- 10.1.9 The CCR rules differ depending on whether or not the transaction in question is cleared through a central counterparty (CCP). It follows that banks must divide up all their transactions subject to a CCR capital charge into two categories: those not centrally cleared, and those that are centrally cleared. A bank will always know whether its transactions are centrally cleared. However, it is not the role of the Basel III framework to determine which transactions are required to be centrally cleared in any given jurisdiction. Other legislation, like the Dodd-Frank Wall Street Reform and Consumer Protection Act in the United States, and the European Market Infrastructure Regulation (EMIR) in the EU do this. At present, the UK continues to adhere to a modified version of the EMIR framework as retained EU law<sup>1021</sup>.
- 10.1.10 For non-centrally cleared transactions the following approaches are allowed to calculate the capital charge for CCR:
- (a) a standardised approach (SA-CCR). The standardised approach must be used if a bank does not have permission to use the internal models method (IMM-CCR);
  - (b) a value-at-risk (VaR) models approach to calculate the capital charge for banks applying an IRB approach to credit risk; and
  - (c) the IMM-CRR approach, subject to prior supervisory approval<sup>1022</sup>.
- 10.1.11 For centrally-cleared exposures only a single approach is available, which generates the capital charges for: (i) exposures to a central counterparty (CC); (ii) exposures to clients if the bank is a clearing member of the CCP and (iii) exposures to a clearing member if the bank is not a clearing member of the CCP<sup>1023</sup>. Exposures to CCPs arising from the settlement of cash transactions (equities, fixed income securities, spot foreign exchange and spot commodities) are subject to a bespoke capital regime<sup>1024</sup> described in chapter 8 on capital charges for Unsettled Transactions and Failed Trades.
- 10.1.12 The Basel III standard exempts the following transactions from the CCR capital charge:
- (a) credit protection purchased by a bank under a derivative against either a banking book transaction, or against a counterparty credit risk exposure; and
  - (b) sold credit default swaps held in the banking book treated as a guarantee and risk-weighted at the full amount<sup>1025</sup>.
- 10.1.13 These are highly technical exemptions. In the former case, there is no CCR capital charge as the risk to the bank is addressed under the credit risk mitigation framework (either standardised or IRB). In the latter case, as the risk has already given rise to a capital charge, it would be illogical to impose a second charge under the CCR framework.

## 10.2 Definitions relevant to the CCR Framework

10.2.1 We set out below the definitions used by the CCR framework, before describing the different methodologies for calculating CCR capital charges set out above.

- (a) A **long settlement transaction** is a transaction where a counterparty undertakes to deliver a security, a commodity, or a foreign exchange amount against cash, other financial instruments, or commodities, or the opposite, at a settlement or delivery date specified in the contract that is longer than the market standard delivery date for that currency, instrument or commodity. Any settlement date that is more than five business days after entry into the transaction is automatically deemed to be a long settlement position<sup>1026</sup>. It follows that five days acts as a cap, and only market practices requiring settlement before then will be recognised for capital purposes.
- (b) A **securities financing transaction** is a transaction where “the value of the transactions depends on market valuations and the transactions are often subject to margin agreements”<sup>1027</sup>. This is a singularly unhelpful definition as the value of a great many transactions depends on market valuations. For example, almost all derivatives satisfy this definition. However, it is clear from the examples that the range of transactions caught is narrower. These are: repurchase agreements, reverse repurchase agreements, securities lending and borrowing, and margin lending transactions<sup>1028</sup>. Only repo style transactions are intended to be caught.
- (c) A **margin lending transaction** is a transaction in which a bank extends credit in connection with the purchase, sale, carrying or trading of securities. Margin lending expressly excludes other loans that are secured by securities collateral. Generally, in margin lending the loan is collateralised by securities with a greater value than the amount of the loan<sup>1029</sup>.

10.2.2 The next set of definitions relates to netting sets and similar terms:

- (a) A **netting set** is a group of transactions with a single counterparty subject to a legally enforceable bilateral netting agreement for which netting is recognised for regulatory capital purposes applicable to the group of transactions. Each transaction that is not subject to an enforceable bilateral netting arrangement must be interpreted as its own netting set<sup>1030</sup>. Netting sets are relevant to many different areas of Basel III which permit bilateral netting to be recognised for capital purposes. Multi-lateral netting is not recognised as in many jurisdictions it is not enforceable in an insolvency<sup>1031</sup>.
- (b) A **hedging set** is a set of transactions within a single netting set within which full or partial offsetting is recognised when calculating the potential future exposure add-ons under the standardised approach to CCR<sup>1032</sup>.

- (c) A **margin agreement** is a contractual agreement, or part of a wider agreement, under which one counterparty must supply variation margin to another counterparty when the exposure or exposures to that counterparty exceeds a specified level<sup>1033</sup>. In practice, the provision of variation margin may depend on other factors than simply exposure size or value.
- (d) The **margin threshold** is the largest amount of margin that remains outstanding until one party has the right to call for variation margin<sup>1034</sup>. Normally, the trigger for a margin call will be some metric being exceeded, such as outstanding exposure value. This will be defined either in the relevant agreement with the counterparty, or by the CCP where transactions are centrally cleared.
- (e) The **margin period of risk** is defined as the period of time from the last exchange of collateral covering a netting set of transactions with a defaulting counterparty until that counterparty is closed out and the resulting market risk is re-hedged<sup>1035</sup>. This is different from the general definition in Basel III. Also, margin can take other forms than collateral, for example, a letter of credit.
- (f) The **effective maturity** under the Internal Models Method for a netting set with a maturity of greater than one year is the ratio of the sum of expected exposure over the life of the transactions in a netting set discounted at the risk-free rate of return divided by the sum of expected exposure over one year in a netting set discounted at the risk-free rate<sup>1036</sup>. This is calculated using a formula<sup>1037</sup>.
- (g) **Cross-product netting** refers to the inclusion of transactions in different product categories within the same netting set<sup>1038</sup>.

### 10.3 Calculation of Capital Charges

- 10.3.1 The capital charge is based on the amount of the exposure at default. The CCR framework interchangeably refers to an “exposure” or the “EAD”. This is potentially confusing, as EAD is a risk input under the IRB framework, and does not apply to banks using the standardised approach to credit risk. The reason given is that “the amounts calculated under the counterparty credit risk rules must typically be used as either the ‘exposure’ within the standardised approach to credit risk, or the EAD within the internal ratings-based (IRB) approach to credit risk”<sup>1039</sup>. Whilst this is correct, consistent use of a single term would enhance clarity. We refer solely to “exposures” save when discussing the IRB capital charge.
- 10.3.2 The exposure amount for a given counterparty is equal to the sum of the exposure amounts for each separate netting set with that counterparty<sup>1040</sup>. Where there is only a single netting set this may be one, but may be more, for example if the bank has different exposure types with that counterparty (OTC derivatives, repos) and no cross-product netting agreement.
- 10.3.3 A bespoke treatment applies to certain credit valuation adjustments (CVAs) on OTC derivative transactions with a given counterparty. The CVA measures the risk of a bank suffering a market risk loss as a result of the deterioration

of a counterparty's creditworthiness, and is discussed in the chapter 12. The exposure value for any given counterparty is the greater of zero and the sum of all exposures across all netting sets with that counterparty less any CVA losses that have been deducted from capital as actual losses<sup>1041</sup>. The purpose of this treatment is to prevent losses that have already been deducted from capital inflating the CCR capital charge, which is understandable.

- 10.3.4 Once a bank has determined its exposures subject to the CCR framework it must then apply either the standardised approach or an IRB approach (as the case may be). Banks applying the standardised approach must use the risk weights applicable to that counterparty under the standardised approach. IRB banks apply the relevant IRB approach (standardised or advanced), including the PD, LGD and EAD, and, where relevant, M, to determine their IRB capital charge. However, it is the EAD associated with the counterparty credit risk exposure that must be used in the IRB calculation of RWAs and expected loss amounts<sup>1042</sup>.
- 10.3.5 Banks using the Internal Measurement Method calculate RWAs as the higher of the following:
- (a) the sum of RWA calculated using current parameter calibrations; and
  - (b) the sum of RWA calculated using stressed parameter calibrations<sup>1043</sup>.

#### 10.4 The Standardised Approach to CCR

- 10.4.1 The standardised approach to CCR (SA-CCR) applies to OTC derivatives, exchange-traded derivatives and long-settlement positions<sup>1044</sup>. Securities financing transactions are excluded. All banks that do not have permission to apply the Internal Models Method must use the standardised approach<sup>1045</sup>.

##### *Netting and netting legal opinions*

- 10.4.2 Basel III recognises netting by novation of derivative transactions. This is a form of netting under which any existing transaction that has not yet been performed are novated with any new transaction or transactions with the same counterparty and in the same currency so as to create a single performance obligation. For example, if a bank agrees to sell US\$ 100,000 for euro in three months' time and at a later date agrees to buy US\$ 50,000 for euro to be delivered on the same date then the two contracts can be novated to produce a single agreement to sell US\$ 50,000 for euro on that date. Netting by novation only applies to derivative contracts with the same currency and delivery/performance date, and is different from close-out netting as it applies each time a new transaction in the same underlying for the same performance date is entered into, as opposed to following a default. Netting by novation *can* also be relevant in a default situation where it is not possible to cancel the outstanding executory contracts following a default, but only to close them out by entering into an equal and opposite transaction, with a different counterparty, at a different price after a default. This type of netting may be used by exchanges to close-out open contracts after a default and crystallise the profit/loss on the outstanding contracts at or after a default. However, close-out netting, where each open contract is cancelled and replaced by a notional profit or loss amount, the sum of which are then

netted against each other to produce a single sum payable to or by a defaulter, if appropriate, after realisation and set-off of collateral, is perhaps more common.

10.4.3 Basel III states that banks may net transactions when determining the replacement cost (RC) if “any obligation between a bank and its counterparty to deliver a given currency on a given value date is automatically amalgamated with all other obligations for the same currency and value date, legally substituting one single amount for the previously gross obligations”<sup>1046</sup>. Other forms of bilateral netting are stated to be eligible if they are legally valid<sup>1047</sup>. The following detailed requirements apply:

- (a) the netting agreement must produce a single legal obligation covering all included transactions so that the bank will either pay or receive a single sum representing the positive net mark-to-market values of all included transactions;
- (b) the netting agreement is legally enforceable following default, bankruptcy or similar circumstances;
- (c) the netting agreement does not contain a walkaway clause<sup>1048</sup>. This is a contractual provision entitling a non-defaulting counterparty to make only limited payments or no payments at all. The prohibition on such clauses is presumably driven by a concern that if a bank defaults it would not be able to recover in full any amounts that would otherwise be payable to it, and this could result in a loss to creditors and, potentially, depositors;
- (d) the bank obtains written reasoned legal advice that in the event of challenge the relevant courts and administrative authorities would find the bank’s exposure to be the net amount. This confirmation must be obtained under the following laws: the law of the place of incorporation of the counterparty, the law where the branch is located if an overseas branch, the governing law of the transactions and the law that governs the netting agreement; and
- (e) the legal review referred to above is kept under review in light of possible changes to the relevant laws<sup>1049</sup>.

10.4.4 We would make the following observations:

- (a) Firstly, only netting by novation seems to be recognised. However, the more commonly used close-out netting does not. Both are enforceable under English law, although as English insolvency law is mandatory and cannot be contracted out of, the netting agreement must follow detailed legal requirements<sup>1050</sup>. There is no netting statute in England as it is not necessary.
- (b) Secondly, Basel does not specify what form the legal review must take, although in view of the requirement that the review is “reasoned” then an external legal opinion would seem the most straightforward way of satisfying this requirement. The opinion must also cover all relevant insolvency procedures applicable to the counterparty, so a standard legal

opinion with a generic reservation in respect of insolvency opinions is non-compliant.

- (c) Thirdly, the list of laws under which the opinions must cover is logical, although it will be easier for banks to satisfy the Basel rules by ensuring that the law governing the individual transactions and the netting agreement are the same. The term used for incorporation in the Basel III text is “chartered”, but it must mean the real seat in jurisdictions that use this test, unless the company is incorporated in one jurisdiction and has its real seat in a second, in which case both ought to be relevant. Following the collapse of BCCI in 1991 banking regulators globally adopted new rules to prevent banks arbitraging between the place of incorporation and where they actually carry on their business, so the number of cases where this is permitted should be very rare<sup>1051</sup>.
- (d) Fourthly, some procedure for updating the legal opinions needs to be established. Unless local supervisors specify otherwise, this could take the form of refreshing the legal opinions every year (or obtaining a new one where there are material changes to the relevant law).

10.4.5 Basel III states that national supervisors must be satisfied, after any relevant consultation with other supervisors, that the netting agreement is enforceable under all relevant laws. If a supervisor is not so satisfied the netting agreement is not recognised<sup>1052</sup>. It is understandable that if a national supervisor considers netting agreements to be unenforceable then they cannot be relied on to reduce regulatory capital charges. However, unless a supervisor is told by a regulator in a different jurisdiction that netting is invalid then we consider it highly unlikely that a national supervisor would seek to second guess a legal opinion from a law firm in the relevant jurisdiction stating that it is. Netting is recognised in most major jurisdictions, although there may be specific requirements that need to be met under local law for an agreement to be enforceable.

#### *Calculating the capital charge under the standardised approach*

10.4.6 The following factors are taken into account in determining the capital charge under the standardised approach:

- (a)  $\alpha = 1.4$  (it is a scaling factor to generate higher capital charges to reflect possible weaknesses in the calculation as a measure of risk);
- (b) RC = the replacement cost (as calculated in accordance with the following calculations); and
- (c) PFE = the amount for potential future exposure<sup>1053</sup>.

10.4.7 We now proceed to explain RC and PFE.

#### *Margined and un-margined transactions*

10.4.8 Both RC and PFE must be calculated differently for margined and un-margined netting sets. Margined sets are netting sets covered by a margin agreement requiring the posting of variation margin. Un-margined transactions are all

other netting sets, including where the agreement requires only the bank (and not its counterparty) to post margin<sup>1054</sup>.

- 10.4.9 There is a cap on the exposure value for margined netting sets. This is the exposure amount had the netting set not been margined<sup>1055</sup>, which makes sense. The reason given by the Committee is “the need to ignore exposure from a large threshold amount that would not realistically be hit by some small (or non-existent) transactions”<sup>1056</sup>.
- 10.4.10 For *un-margined* transactions the replacement cost (RC) captures the loss that a bank would suffer should a counterparty default and the bank closed-out all of its transactions immediately<sup>1057</sup>.
- 10.4.11 For *margined* transactions RC also is intended to capture the loss that a bank would incur if a counterparty defaulted and all transactions were replaced immediately. However, there is a difference as there may be a period of time between the last exchange of collateral and the default of the bank’s counterparty without variation margin having been provided<sup>1058</sup>. The RC for margined transactions should, however, be lower for margined than un-margined transactions because of the existence of variation margin under the agreement.
- 10.4.12 Any non-cash collateral must be subject to a “haircut” in both cases. The “haircut” represents the potential change in value of the collateral during the relevant time frame (one year for un-margined trades, and the margin period of risk for margined trades)<sup>1059</sup>.
- 10.4.13 The Replacement cost (RC) is calculated at the netting set level.
- 10.4.14 As has been seen, RC is calculated differently for margined and un-margined transactions. Margined transactions may include both bilateral transactions (such as under an ISDA Master Agreement) and those that are centrally cleared<sup>1060</sup>. However, in the case of centrally cleared transactions the provisions on margining are likely to be set out in any relevant exchange’s or CCP’s rules.

#### *RC for un-margined transactions*

- 10.4.15 RC for un-margined transactions is the greater of: (i) the current market value of the derivative contracts less the market value of the collateral (after applying haircuts) held by the bank (if any); and (ii) zero<sup>1061</sup>. The following steps must be taken. Firstly, the bank calculates the market value of the outstanding derivative contracts. Secondly the bank values the collateral it has received from its counterparty (if any). Thirdly, the bank applies applicable haircuts to the value of the collateral (which are the haircuts under the standardised approach to credit risk, adjusted as described below). Fourthly, the bank deducts the haircut-adjusted value of the collateral from the exposure amount. If this amount is positive then this is the RC of the transactions. If the amount is negative as the bank has to make a payment to the counterparty then the RC is set at zero.
- 10.4.16 The following formula applies (which is simply a formal way of writing what has been described in the preceding paragraph)<sup>1062</sup>:

$$RC = \max \{V - C; 0\}^{1063}$$

where:

V = the value of the derivative transactions in the netting set; and

C = the value of the collateral after application of haircuts<sup>1064</sup>.

#### *RC for margined transactions*

10.4.17 The RC for margined transactions is defined as the greatest exposure that would not trigger a margin call (i.e. the posting of variation margin) based on the terms of the margining agreement<sup>1065</sup>. For example, the margin agreement may include both a threshold amount, triggering the obligation to provide variation margin, and a minimum amount of margin that must be posted in that event. Margin may be transferred by way of security (as tends to be more common in the United States) or by outright transfer of title (as is perhaps more common under English law).

10.4.18 The calculation of the RC is described in the following paragraphs. As margined transactions incorporate initial and variation margin, it is necessary to reflect the actual process for the exchange of collateral over the life of the transaction. Basel III introduces two new terms: the independent collateral amount (ICA) and the net independent collateral amount (NICA). These will now be explained.

10.4.19 The ICA represents: (i) collateral (other than variation margin) posted by a bank's counterparty that the bank may realise upon the default of the counterparty, the amount of which does not change in response to the value of the transactions it secures and/or (ii) the "independent amount" defined in market standard documentation<sup>1066</sup>. This will now be unpacked.

#### *Determining the ICA*

10.4.20 There are two limbs to the determination of the independent collateral amount (ICA): collateral posted by the counterparty that meets specified requirements *and* collateral that falls under the definition of an "independent amount".

10.4.21 The first part comprises any collateral posted by the bank's counterparty that meets two requirements: (i) it is not "variation margin" and (ii) the amount of the collateral posted is insensitive to the *value* of the transactions. In most cases these two will be the same as initial margin will be insensitive to the value of current transactions, as that is the purpose of variation margin, although it is possible to draft contractual provisions that operate differently, so this distinction may be necessary.

10.4.22 The concept of an "independent amount" seems intended to capture amounts described as such under market standard documentation. There is no definition in the Basel III text, but a footnote refers to the 1992 and 2002 ISDA Master Agreements and supporting security documentation<sup>1067</sup>.



10.4.23 Because both a bank and its counterparty may be required to post ICA, Basel III uses the concept of a net independent collateral amount or NICA. NICA is simply the amount of collateral that a bank may use to off-set its exposure on the default of its counterparty<sup>1068</sup>. The point is that if such collateral exists and can be realised then there is no risk of an actual loss materialising. Expressly excluded are amounts posted to a segregated and bankruptcy-remote account that would be returned after the insolvency of the counterparty<sup>1069</sup>. Under English law this would require that full title not pass to the insolvent counterparty. The most usual way of doing this is through a trust account, although other arrangements may suffice<sup>1070</sup>.

#### NICA

10.4.24 NICA is also defined as “any collateral (segregated or unsegregated) posted by the counterparty less the unsegregated collateral posted by the bank”<sup>1071</sup>. This need not be the same thing and, presumably, any collateral posted by the counterparty must be legally available to the bank in the event of the counterparty’s default, and any segregated collateral posted by the bank must not be legally available to the counterparty’s creditors. Segregation may help achieve this, but it is not identical.

#### *Calculating the RC*

10.4.25 Having calculated the ICA and the NICA banks then determine the replacement cost (RC) for margined transactions in accordance with a formula which is set out below. The idea is that RC will be equal to the larger of three figures. The first is the value of the derivative exposures less the haircutted collateral value (the calculation this time must include variation margin). The second figure measures the sum of the threshold amount before the counterparty is required to post variation margin plus the minimum amount of collateral that will be posted less NICA (including both initial and variation margin). The idea is that where the net independent collateral amount (i.e. the amount of collateral the bank can use to reduce its exposure to its counterparty’s default) is less than the exposure amount before the counterparty is required to post variation margin plus the amount of total margin that the counterparty must then post then the bank will suffer a credit loss. Although perhaps counter-intuitive on a first reading, this makes sense once the reader remembers that the whole point of the CCR framework is to determine under which circumstances a bank may suffer a credit loss if its counterparty defaults.

10.4.26 The third figure is zero. This underscores the policy choice made by the Basel Committee that the replacement cost can never be a negative amount where the bank does not suffer a loss if its counterparty defaults. If it could then a bank could reduce its capital charge for CCR by the amount of those exposures it must pay which would not be prudent as a payment obligation does not reduce in any way the loss a bank will suffer if its counterparties default.

10.4.27 The relationship between the three figures will now be explained. The first figure measures the loss to the bank based on amount of the derivative exposure less the initial and variation margin the bank can use to reduce the exposure where its counterparty defaults. The second figure measures the loss to the bank as a result of its counterparty failing to post variation margin

after realising all collateral already provided. The third figure is zero so as to exclude from the calculation the circumstances where the bank is over-collateralised, to prevent such excess collateral that would need to be returned to its counterparty in a default scenario<sup>1072</sup> affecting the calculation. Seen in this light it is logical that the greatest loss a bank may suffer in a default scenario is the greater of a margin shortfall based on already posted margin or a variation margin shortfall. Although a bank may suffer both types of loss, only the highest figure represents the worst case scenario as these are in both cases actual losses.

10.4.28 Having explained the RC for margined transactions we will now set out the formula which is again a formal way of writing what has already been explained.

10.4.29 The following definitions apply:

- (a)  $V$  = the value of the derivative transactions in the netting set;
- (b)  $C$  = the collateral value of any initial margin provided (after application of relevant haircuts).  $C$  now includes the net variation margin amount (i.e. the variation margin received by the bank less variation margin posted by it);
- (c)  $TH$  = the positive threshold before the bank's counterparty must post variation margin; and
- (d)  $MTA$  = the minimum amount of collateral that must be posted in this event<sup>1073</sup>.

10.4.30 The replacement cost for margined transactions is calculated as follows:

$$RC = \max \{V - C; TH + MTA - NICA; 0\}^{1074}$$

10.4.31  $TH + MTA - NICA$  represents the largest exposure that would not trigger a variation margin call and contains the levels of collateral that need always to be maintained. The subtraction of  $NICA$  is intended to reflect both the actual level of exposure that would not trigger a margin call and the effect of collateral already posted to the bank<sup>1075</sup>.

#### *Potential future exposure (PFE)*

10.4.32 Basel III requires banks to calculate an add-on to the RC to address the risk that at the time of default the size of the exposure may increase due to movements in market values. For example, an option with a strike price of \$100 may have a current market price of \$110. The risk of losses from movements in market prices is addressed through the market risk framework. However, if the market price goes up to \$120 then the bank may suffer an additional \$10 loss from that currently captured under the CCR framework. As market prices can change it is prudent to require a capital calculation to address this potential credit risk. This is called potential future exposure or PFE and attracts an add-on.

- 10.4.33 Over-collateralisation is also relevant to the calculation of PFE. This is because if the exposure increases excess collateral can then be applied to reduce the size of the exposure. Providing the bank can apply such excess collateral this is also sensible. Additionally, negative values for transactions within a given netting set will reduce future CCR losses as all the transactions in the netting set are assumed to be netted out. This ensures that the PFE calculation does not overstate the actual credit risk from market price movements.
- 10.4.34 The PFE calculation therefore has three elements: the add-on for future potential CCR, excess collateral, and negative mark-to-market values. The last two are addressed through a multiplier<sup>1076</sup>. This will now be explained.

#### *Add-ons*

- 10.4.35 Add-ons are supervisory adjustments to reflect PFE. The standardised approach requires exposures to be broken down by asset class, with each asset class attracting a different add-on, although the process for calculating add-ons is very similar. The asset classes for this purpose are:
- (a) interest rate derivatives;
  - (b) foreign exchange derivatives;
  - (c) credit derivatives;
  - (d) equity derivatives; and
  - (e) commodity derivatives<sup>1077</sup>.
- 10.4.36 Basel III does not permit recognition of any diversification benefits across asset classes. Instead, the add-ons for each asset class are simply aggregated. Formally, this is expressed as follows:
- $$\text{AddOn}^{\text{aggregate}} = \sum_{\text{assetclass}} \text{AddOn}^{(\text{assetclass})} \quad 1078$$
- 10.4.37 Derivatives may be more complex than the list of asset classes set out above and exhibit features of more than one asset class. In this case the allocation of transactions to any given asset class must be made based on its primary risk driver. The text states that most derivative transactions have one primary risk driver, defined by reference to the underlying instrument (e.g. the interest rate curve for interest rate derivatives, a reference entity for a credit default swap). If the primary risk driver can be identified it must be used<sup>1079</sup>.
- 10.4.38 For more complex derivatives with multiple risk drivers (e.g. multi-asset or hybrid derivatives) banks are required to identify the primary risk driver based on sensitivities and volatility of the underlying<sup>1080</sup>. Supervisors may require more complex derivatives to be allocated to more than one asset class<sup>1081</sup>. In this case the bank must determine separately for each asset class to which the derivative is allocated the sign and delta adjustment (see below)<sup>1082</sup>.
- 10.4.39 In all other cases, the bank will identify the primary risk factor and attribute each transaction to one of the five asset classes<sup>1083</sup>. The add-ons for each

asset class are then calculated using asset class-specific formulae<sup>1084</sup>. Although the formulae differ from asset class to asset class, they all use the steps set out in the following paragraphs<sup>1085</sup>.

#### *Effective notional amount*

- 10.4.40 The first factor is determination of the **effective notional** (D). The effective notional is calculated for each derivative (i.e. every single trade in the netting set). D measures the sensitivity of the trade to movements in underlying risk factors. D is calculated through applying a formula<sup>1086</sup>.
- 10.4.41 The following factors are used to calculate D: (i) the adjusted notional or d; (ii) the maturity factor or MF; and (iii) the supervisory delta or  $\delta$ . These will now be described.
- 10.4.42 The adjusted notional or d is a measure of the size of a trade. For FX derivatives it is the notional value of the FX leg of the derivative contract. For equity and commodity derivatives it is the current price of the relevant share or unit of the commodity multiplied by the number of shares or commodity units held by the bank (i.e. the market value of the bank's current notional exposure). For credit and interest-rate derivatives the adjusted notional is the notional amount adjusted by a measure of the duration of the notional exposure. This is to reflect the fact that that the value of derivatives with a longer duration are more sensitive to movements in the price of underlying risk factors<sup>1087</sup>.
- 10.4.43 The maturity factor or MF is a parameter that takes account of the period of time over which the potential future exposure or PFE is calculated. MF depends on whether or not the netting set is margined or un-margined<sup>1088</sup>.
- 10.4.44 The supervisory delta or  $\delta$  is used to take into account whether the trade is long or short. This is done through a sign which is positive for long positions and negative for short positions. It also takes into account whether the value of the derivative is linear to the value of the underlying (e.g. a forward) or non-linear (such as an option)<sup>1089</sup>. The value of derivatives is non-linear to that of the underlying if a given change in the market price of the underlying result in a non-proportional change in the value of the derivative e.g. if a change of 10% in the price of the underlying results in a 30% change in the value of the derivative.
- 10.4.45 The formula to calculate D is as follows:

$$D = d * MF * \delta^{1090}$$

D is therefore the product of the adjusted notional representing the value of the transaction, a maturity factor and the supervisory parameter  $\delta$ .

#### *Supervisory factors*

- 10.4.46 The second factor used is a supervisory factor or SF. This is the specified change in the value of the underlying risk factor on which the PFE is calculated. It is calibrated to take into account the volatility of underlying risk factors<sup>1091</sup>.

### Calculating PFE add-ons

- 10.4.47 In calculating PFE each of the transactions within each asset class are allocated to supervisory hedging sets. The purpose of a hedging set is group together transactions within a given netting set in respect of which long and short positions can be offset against each other when calculating PFE<sup>1092</sup>. The idea that where there are matching long and short positions then the maximum potential loss to the bank is represented by the net long or short position and not by aggregating long and short positions.
- 10.4.48 Aggregation formulae are used to aggregate the effective notional amounts and supervisory factors across all transactions within each hedging set and finally at the asset class level to generate the add-on for each asset class on an aggregate basis. The method of aggregation varies between the different asset class and for credit derivatives, equity derivatives and commodity derivatives involves the use of supervisory parameters to take into account the diversification of transactions as well as basis risk<sup>1093</sup>. These are set out in the table below<sup>1094</sup>.

Summary table of supervisory parameters				
Asset class	Sub-class	Supervisory factor	Correlation	Supervisory option volatility <sup>1095</sup>
Interest rate		0.5%	N/A	50%
Foreign exchange		4%	N/A	15%
Single name credit derivative	AAA	0.38%	50%	100%
	AA	0.38%	50%	100%
	A	0.42%	50%	100%
	BBB	0.54%	50%	100%
	BB	1.06%	50%	100%
	B	1.6%	50%	100%
	CCC	6.0%	50%	100%
Index credit derivative	IG	0.38%	80%	100%
	SG	1.06%	80%	100%
Single name equity		32%	50%	120%
Equity index		20%	80%	75%
Commodity	Electricity	40%	40%	150%
	Oil/gas	18%	40%	70%
	Metals	18%	40%	70%
	Agricultural	18%	40%	70%
	Other	18%	40%	70%

- 10.4.49 The standardised approach uses four time parameters, which are all expressed in years<sup>1096</sup>. It is outside the scope of this guide to set out or describe the detailed calculations.
- 10.4.50 The add-ons are determined for each asset class. Their calculation is set out in the text of Basel III.

*PFE and excess collateral*

- 10.4.51 The Basel Committee considers that over-collateralisation (i.e. where a bank holds excess collateral posted by a counterparty) should reduce capital requirements for CCR. This is because the bank can realise such collateral to cover a credit loss if its counterparty defaults, and banks may insist on over-collateralisation precisely in order to mitigate potential future losses from changes in market variables. Such excess collateral above that needed based on the current market value of the derivative positions may reduce both the RC and the PFE calculations<sup>1097</sup>.
- 10.4.52 For prudential reasons the Basel Committee does not allow all of excess collateral to be eligible to reduce capital charges. Instead, a multiplier is applied so that recognition of excess collateral decreases as the amount of such collateral increases, without ever reaching zero. A floor of 5% of the PFE add-on applies to such collateral recognition<sup>1098</sup>. Where a bank is over-collateralised then RC is zero and the PFE is less than the full amount of the add-on.
- 10.4.53 The multiplier is activated where the current value of the derivative transactions in the netting set is negative. This reflects the fact that transactions that are out of the money do not give rise to a credit exposure, and are less likely to move to being in the money<sup>1099</sup>.
- 10.4.54 In calculating the multiplier the following apply:
- (a)  $\exp(\dots)$  is the exponential function;
  - (b) the floor is 5%;
  - (c)  $V$  is the value of the derivative transactions in the netting set; and
  - (d)  $C$  is the value of excess collateral held net of applicable haircuts<sup>1100</sup>.

$$\text{multiplier} = \min\left\{1, \text{floor} + (1 - \text{floor}) * \exp\left(\frac{V - C}{2 * (1 - \text{floor}) * \text{AddOn}_{\text{aggregate}}}\right)\right\}$$

- 10.4.55 The PFE add-on for *un-margined* transactions represents a potential conservative increase in exposure size over a one-year time horizon<sup>1101</sup>. For *margined* transactions the PFE add-on represents the potential change in value of the exposure since the last exchange of collateral<sup>1102</sup>.
- 10.4.56 The PFE add-ons are calculated at the level of each netting set and then aggregated<sup>1103</sup>.
- 10.4.57 Exposures are calculated as follows:

$$\text{exposure amount} = \alpha \times (\text{RC} + \text{PFE})^{1104}$$

- 10.4.58 *Sold options* receive a zero exposure value if premiums are paid up front and are outside any netting or margin agreement<sup>1105</sup>. This is because if such options are outside a netting set, and the premium has been paid up front, the options constitute a potential liability only as the bank will suffer no loss if its counterparty defaults.
- 10.4.59 Where a bank sells credit derivatives that are outside of any netting set the exposure is capped at the amount of any unpaid premium<sup>1106</sup>. This also is sensible as in this case the bank's only exposure to its counterparty is the amount of any unpaid premia. The difference between options and credit derivatives would seem to reflect market practice that the price of an option is paid up front, whilst credit derivatives require periodical payments to the protection provider.
- 10.4.60 Banks may decompose more complex derivatives (e.g. an option with caps and floors) into a series of notional derivatives with individual caps and floors to determine the CCR capital charge. Linear derivatives (e.g. interest rate swaps) cannot be decomposed<sup>1107</sup>.

#### A bird's eye view of Counterparty Credit Risk

Under Basel III, financial institutions may opt to calculate their counterparty credit risk (CCR) risk-weighted assets (RWA) using the revised standardised approach for measuring counterparty credit risk (SA-CCR) or, subject to regulatory approval, the internal model method (IMM).

The total exposure at default (EAD) under the SA-CCR consists of two components, the replacement cost (RC) and the potential future exposure (PFE), with alpha as a constant value set to 1.4 by the Committee, in line with the IMM.

The RC quantifies the immediate loss that would occur if a counterparty were to default. It is calculated as the total mark-to-market (MtM) of the derivative trades at the netting set level less collateral.

The PFE consists of (i) a multiplier that allows for the partial recognition of excess collateral or negative market values and (ii) an "aggregate add-on", which is the sum of five asset-class level add-ons.

## 10.5 Internal Models Method

- 10.5.1 The second approach to calculating CCR is the Internal Models Approach or IMM. Banks can only use this approach with prior supervisory consent<sup>1108</sup>, and use of IMM is dependent on meeting the minimum criteria<sup>1109</sup>. However, the use of the IMM is independent of which approach banks use to calculate credit risk i.e. a bank using the standardised approach to credit risk may use the IMM approach, and an IRB bank may use the standardised approach to CCR if it does not obtain approval to use IMM<sup>1110</sup>.
- 10.5.2 It follows that banks that apply the standardised approach to credit risk must use a model that is compatible with the standardised approach when calculating IMM capital charges. On the other hand, an IRB bank must use the relevant IRB approach(es) to calculate IRB capital charges for CCR under an

IMM model. For this reason the Basel III standard refers indiscriminately to either the exposure value or the EAD.

- 10.5.3 Banks that use the IMM must, in principle, apply it to all transactions on which it is required to calculate CCR except long-settlement transactions<sup>1111</sup> (which may be treated under the standardised approach). This is, however, subject to an important qualification. Banks may adopt the IMM either only for OTC derivative transactions, only for securities financing transactions (SFTs), or for both<sup>1112</sup>. This seems curious as the treatment, in this case, of exchange-traded derivatives is uncertain. Centrally-cleared exchange-traded derivatives *may* be cleared using a CCP, but this is not necessarily the case in all jurisdictions. Settlement must, of course, take place, but transactions can settle through other means, for example, by a clearing house guaranteeing performance of all transactions without becoming a party to them. The Basel III text seems to assume all exchange-traded derivatives will also be cleared through a CCP.
- 10.5.4 Where a bank uses the IMM for OTC derivatives or SFTs, it must apply that method to all relevant exposures within that category, other than exposures that are immaterial in terms of size and risk. However, during the initial implementation of the IMM a bank may continue to apply the standardised approach for a portion of its business. However, the bank must submit a plan to its supervisor explaining how it will bring all material exposures under IMM<sup>1113</sup>.
- 10.5.5 Capital requirements in respect of CCR arising out of long-settlement transactions may be calculated using either IMM or the standardised approach<sup>1114</sup>.
- 10.5.6 Once a bank moves from the standardised approach to IMM only under exceptional circumstances will the bank be allowed to revert to the standardised approach, and only where this would not lead to an arbitrage of regulatory capital rules<sup>1115</sup>.
- 10.5.7 Transactions not covered by a firm's IMM approval must be treated applying the standardised approach<sup>1116</sup>.
- 10.5.8 Under IMM, CCR is calculated at the level of individual netting sets. An internal model must specify the forecasting distribution for changes in the market value of each netting set attributable to changes in market variables, such as interest rates, FX rates, etc. The model then computes the bank's CCR for each netting set at each future date given the changes in the market variables. For margined counterparties, the model may also capture future movements in collateral provided. In respect of transactions in the banking book, only the forms of collateral recognised under the simple approach to collateral under the standardised approach are eligible<sup>1117</sup>. Collateral eligible under the comprehensive approach and the IRB approach are excluded. However, for trading book exposures all instrument that are included in the trading book are eligible for repo-style transactions<sup>1118</sup>. The qualitative and quantitative data requirements set out below must be met in respect of the collateral<sup>1119</sup>. Collateral cannot be double counted<sup>1120</sup>.
- 10.5.9 The capital charge for CCR under the internal models method depends on the higher of two amounts. The first is calculated using current parameter



estimates, and the second is based on stressed parameter estimates. Specifically, the bank must determine the effective expected positive exposure amount using both current and stressed figures on a total portfolio basis (i.e. the stressed calibration is applied to the portfolio as a whole and not to individual transactions)<sup>1121</sup>.

- 10.5.10 It should be stated that banks are not required under IMM to employ a single model. Any models are acceptable so long as they are approved by the national supervisor, and meet the relevant minimum requirements<sup>1122</sup>.
- 10.5.11 When calculating “expected exposure” and “peak exposure”, banks must take into account (where appropriate<sup>1123</sup>) of the possibility of fat tails<sup>1124</sup>. A “fat tail” is, basically, a situation where there is a higher than expected probability of an extreme movement in price occurring<sup>1125</sup>. This occurred during the global financial crisis, notably after the collapse of Lehman Brothers.
- 10.5.12 Under the IMM the exposure amount is equal to the effective expected exposure amount multiplied by a multiplication factor alpha ( $\alpha$ )<sup>1126</sup>.
- 10.5.13 Alpha is generally set at 1.4<sup>1127</sup> representing a 40% uplift. Supervisors may set a higher  $\alpha$  based on an individual bank’s CCR exposures. Factors that could justify such a supervisory uplift include a low granularity of counterparties, high “wrong-way” risk (where the risk of loss is positively correlated to the risk of a counterparty or counterparties defaulting) and other institution-specific characteristics<sup>1128</sup>.
- 10.5.14 Banks can calculate  $\alpha$  based on internal estimates with prior supervisory approval. In this case  $\alpha$  is always floored at 1.2 (a 20% uplift). Banks must estimate  $\alpha$  as the ratio of economic capital from a full simulation of counterparty credit risk exposure<sup>1129</sup> to the economic capital requirement based on the expected positive exposure (EPE)<sup>1130</sup>. In order to be able to use own estimates for  $\alpha$  banks must show that their internal estimates capture the stochastic dependency of distributions of market values of transactions or portfolios of transactions (e.g. the correlation of defaults across counterparties and between market risk and default risk)<sup>1131</sup>. Specified requirements apply<sup>1132</sup>. Only banks “in full compliance with the qualitative criteria will be eligible for application of the minimum multiplication factor”<sup>1133</sup>.
- 10.5.15 The effective expected positive exposure (or effective EPE) is calculated by the bank estimating the effective exposure ( $EE_t$ ) as the average exposure at future date  $t$ , where the average is taken across possible future values of relevant market risk factors, such as interest rates, foreign exchange rates, etc. The model must estimate expected exposure (EE) at a large number of future dates. Specifically, it is modelled recursively using the following formula:

$$\text{Effective } EE_{tk} = \max(\text{Effective } EE_{tk-1}, EE_{tk})$$

- 10.5.16 A one year time horizon normally applies, unless all transactions in the netting set expire before then, in which case the time horizon is the weighted average of all exposures, calculated using a formula<sup>1134</sup>, which is modified if there are exposures with an original maturity of over one year<sup>1135</sup>.

10.5.17 Where transactions are margined, and the internal model captures the effects of margin, then this is permitted<sup>1136</sup>. The Basel III text notes that “[s]uch models are noticeably more complicated than models of EPE for unmargined counterparties. As such, they are subject to a higher degree of supervisory scrutiny before they are approved”<sup>1137</sup>. Detailed requirements apply<sup>1138</sup>.

*Requirements for validation of internal models*

10.5.18 There are specific requirements to ensure the integrity and soundness of banks’ internal models under IMM. The qualitative criteria include:

- (a) a regular programme of backtesting (an ex-post comparison of the model’s performance against actual outcomes);
- (b) initial validation and on-going periodic review of the model by persons not responsible for developing the model;
- (c) the Board of Directors must be actively involved in the risk control process and must regard CCR control as an essential part of the business devoting significant resources to this task;
- (d) there are daily reports prepared by an independent risk control unit for management with sufficient seniority to be able to order reductions in a bank’s risk exposure;
- (e) the bank’s exposure model is closely integrated into the bank’s day-to-day risk management process;
- (f) there are internal trading and exposure limits;
- (g) the bank has a documented set of internal policies, controls and procedures concerning the operation of the risk measurement system;
- (h) there is an internal review at least once per year of the bank’s risk management system. Specific requirements apply; and
- (i) the validation of the model is periodically reviewed by management with sufficient authority to mandate corrections<sup>1139</sup>.

10.5.19 All IMM models must be sufficiently documented to enable third party recreation of the analysis underlying the model<sup>1140</sup>. There are also further detailed requirements<sup>1141</sup>.

10.5.20 The operational requirements include:

- (a) the internal model’s output is closely integrated into the bank’s daily management of CCR<sup>1142</sup>;
- (b) the bank has a credible track record in using CCR models, and has been using a CCR model that broadly meets the minimum requirements for at least one year<sup>1143</sup>;

- (c) the bank has an independent control unit responsible for designing and implementing the bank's management of CCR risks<sup>1144</sup>;
- (d) the bank has a collateral management unit that calculates and makes margin calls, and manages margin disputes<sup>1145</sup>;
- (e) there is a collateral management unit that meets certain criteria<sup>1146</sup>;
- (f) the bank's cash management policies account for liquidity risks on incoming margin calls, as well as calls to return excess collateral and margin calls triggered by a credit rating downgrade<sup>1147</sup>;
- (g) banks must be able to calculate EE daily if necessary, although it is not a requirement that they actually do so<sup>1148</sup>;
- (h) banks must have in place sound stress testing procedures when assessing capital adequacy requirements<sup>1149</sup>;
- (i) there are data requirements. Where historic market data are used a bank must have at least three years' of data<sup>1150</sup>; and
- (j) the general guidance set out by the Basel Committee elsewhere on the use of internal models (this is undefined and therefore unclear) must be followed<sup>1151</sup>.

10.5.21 There are specific requirements for so-called "wrong-way" risk. As mentioned, this is the risk that potential future credit exposures to a counterparty or counterparties is/are highly correlated to the risk of that counterparty or those counterparties defaulting. Banks must employ stress testing and scenario analysis to address such risk, and monitor wrong-way risk by product, region, industry or other factors, with reporting to management and an appropriate committee of the Board of Directors<sup>1152</sup>. An example of wrong-way risk is a company writing put options on its own shares that are purchased by a bank. The value of such options is directly correlated with the bank's own creditworthiness as the stock price may be expected to decline in response to a fall in the company's credit standing. Another example is a counterparty selling credit default swaps to a bank on a related party whose insolvency would affect the seller<sup>1153</sup>.

#### *Cross-product netting*

- 10.5.22 This is possible for OTC derivatives<sup>1154</sup>, long-settlement positions and securities financing transactions. Banks may include either SFTs or both SFTs and OTC derivatives<sup>1155</sup> under a cross-product netting agreement. There is no mention in the Basel III text of long-settlement positions, which may be included within the CCR IMM framework, as we have seen.
- 10.5.23 National supervisors are permitted to impose approval requirements for the prior use of cross-product netting agreements<sup>1156</sup>. An example is that published by ISDA. There are specific legal criteria for such agreements. A bank must have a written bilateral netting agreement with its counterparty that creates a single legal obligation covering all master agreements and transactions. The effect of the agreement must be that the bank has either

an obligation to pay, or a claim to receive, the net sum of the close-out values of all individual master agreements and the mark-to-market value of all included transactions, following a default or insolvency<sup>1157</sup>. This is a slightly circular requirement as normally under a cross-product netting agreement all transactions under each master netting agreement entered into between the parties are closed-out and then the sums payable under each netting agreement are then netted *inter se*. Walkaway clauses are prohibited<sup>1158</sup>.

- 10.5.24 Banks relying on a cross-product netting agreement must have “written and reasoned legal opinions that conclude with a high degree of certainty that, in the event of a legal challenge, the relevant courts or administrative authorities would find the bank’s exposure under the cross-product netting arrangement to be the cross-product net amount under the laws of all relevant jurisdictions. In reaching this conclusion, legal opinions must address the validity and enforceability of the entire cross-product netting agreement on the material provisions of any included bilateral master agreement”<sup>1159</sup>. Where the cross-product master netting agreement is sponsored by a trade association (like ISDA) we expect that there will be a reasoned legal opinion provided to all members of the association that can be relied on by members (in which case a bank seeking to rely on the opinion will need to become a member). In case of a bespoke bilateral arrangement (which is rare in practice) then specific legal opinions will need to be obtained.
- 10.5.25 The definition of “all relevant laws” is the same as has been considered above under the standardised approach<sup>1160</sup>, which is unsurprising. The legal opinion must also “be recognised as such by the legal community in the bank’s home country or a memorandum of law that addresses all relevant issues in a reasoned manner”<sup>1161</sup>. There is no process for the recognition of legal opinions “by the legal community” in England. However, a reasoned legal opinion addressing all insolvency and resolution procedures should suffice.
- 10.5.26 Banks are required to ensure that any given transaction treated under the cross-product netting rules is covered by the relevant legal opinion(s)<sup>1162</sup>, which is a question of legal due diligence. Opinions must be updated<sup>1163</sup> (the frequency of which is not specified). Banks must also retain all required documentation in their files<sup>1164</sup>. Presumably, this refers to the relevant netting agreements and not legal opinions where they are obtained by a trade association and issued to all their members.
- 10.5.27 National supervisors must be satisfied that banks manage counterparty credit risk on covered transactions on a net basis<sup>1165</sup>. Credit limits and economic capital processes must do the same<sup>1166</sup>.

## 10.6 CCR in the Trading Book

- 10.6.1 CCR can arise in exactly the same way on transactions booked in the trading book. Indeed, it is perhaps more common in the trading book. For this reason the CCR framework applies to both banking and trading book transactions, with the same set of approaches outlined above. However, there are a few changes.
- 10.6.2 Unsurprisingly, the CCR capital charge must be calculated independently of the market risk capital charge (which deals with risks arising out of

movements in market prices, as well as credit valuation adjustments)<sup>1167</sup>. Risk weights in the trading book must be “consistent” with those used in the banking book. Banks using the standardised approach must use standardised risk weights, and IRB banks are required to use the IRB risk weights<sup>1168</sup>.

- 10.6.3 As mentioned above, for repo-style transactions any instruments included in the trading book are eligible collateral<sup>1169</sup>. The “haircut” applicable to such instruments is that applicable to non-main index securities under the comprehensive approach to collateral<sup>1170</sup>. Where a VaR approach is used under the standardised approach to credit risk for securities financing transactions then this model may likewise be used for any trading book transactions<sup>1171</sup>.

## 10.7 Exposures to CCPs

- 10.7.1 As was noted above a bespoke capital treatment applies to exposures to central counterparties. This approach applies to all transactions subject to the CCR framework with CCPs, whether in the trading or banking books. The only exception is for cash transactions (equities, bonds, spot foreign exchange and spot commodity transactions)<sup>1172</sup>. Such transactions are subject to the treatment described in chapter 8.
- 10.7.2 Where a clearing member-to-client leg of an exchange-traded derivatives transaction is conducted under a bilateral agreement, both the client bank and the clearing member must treat the transaction as an OTC derivative<sup>1173</sup>. In such a case the clearing member enters into one transaction with the CCP and a second back-to-back transaction with its counterparty. The CCR risk on the centrally-cleared transaction is the credit risk to the clearing member should the CCP default, and the CCR risk on the bank is the risk of the clearing member defaulting. However, this blanket rule does not take into account of the possibility that the exchange (where there is one) or the CCP may close-out the transactions between a clearing member and the bank. If this is discretionary, then the treatment seems logical, but if mandatory then it seems unduly prudent.

### *Definitions*

- 10.7.3 The following definitions apply to transactions subject to the specific mandatory treatment of CCP-cleared transactions:
- (a) A **central counterparty** is defined as a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller, and the seller to every buyer, thereby ensuring the performance of open contracts<sup>1174</sup>. According to Basel III a CCP becomes a party to trades with market participants either through novation, an open offer system, or other legally binding arrangement<sup>1175</sup>. For the purpose of the Basel framework, a CCP is treated as a financial institution. This definition is curious as becoming a party to each buy or sell transaction brokered between participants on an exchange is the function of a central counterparty. A clearing house is the entity that is legally responsible for ensuring the settlement of transactions on an exchange. In the UK all recognised investment exchanges are required by law to make arrangements for the settlement of transactions<sup>1176</sup>. However, neither an investment exchange

nor a clearing house need be a central counterparty<sup>1177</sup>, nor has this historically been the case. A clearing house can use other methods of ensuring settlement without becoming a party to transactions, and clearing houses have often done so. Purely OTC clearing houses (unaffiliated to any exchange) also exist. The reference to a CCP being a clearing house therefore is confusing.

Central counterparties are further subdivided into “qualifying” and non-qualifying central counterparties.

- (b) A **qualifying central counterparty** is an entity licensed to operate as a CCP (including a license granted by way of confirming an exemption) and is permitted to operate as such. The CCP must be based and prudentially regulated in its jurisdiction in accordance with the *Principles for Financial Market Infrastructures* published by the Committee on Payments and Market Infrastructures and IOSCO<sup>1178</sup>. If, however, the CCP is established in a jurisdiction where there is no regulation of CCPs then the banking supervisor can assess if the foregoing requirements are met<sup>1179</sup>. In addition, specified information must be provided either by the CCP or another person to enable calculation of the capital charge for exposures (see below), as well as enabling the supervisors of clearing member banks to verify this calculation<sup>1180</sup>. Basically, the difference between a qualifying CCP and other CCPs seems to be prudential regulation in accordance with international standards.
- (c) A **clearing member** is a member of, or a direct participant in, a CCP that is entitled to enter into transactions with the CCP, regardless of whether it acts as a financial intermediary for its own clients or on its own account (e.g. proprietary trading). This definition seems to require clearing members to trade on their own behalf<sup>1181</sup>. Although this may be common, the defining characteristic of a clearing member is normally to be able to enter into transactions directly with the CCP, whether through a novation of previous bilateral contracts, or by other means.
- (d) Where a CCP has links to a second CCP, the second CCP is treated as a clearing member of the first CCP. Whether the second CCP’s margin contribution to the first CCP is treated as initial margin or a payment into the default fund depends on the precise legal arrangements. In case of doubt, national supervisors should be consulted to determine the correct treatment<sup>1182</sup>.
- (e) A **client** is a party to a transaction with a CCP through either a clearing member acting as a financial intermediary, or a clearing member guaranteeing the performance of the client to the CCP<sup>1183</sup>. This would not seem to reflect how clearing takes place in many cases. Generally, clearing members enter into a transaction as principal with the CCP even if it is a client trade (in which case there will be a back-to-back transaction between the clearing member and the CCP. The reason is to ensure the mutuality of all transactions entered into by clearing members with the CCP to permit legally enforceable netting in a default scenario. Other structures may be possible under national insolvency law, though it seems odd for the Basel Committee to require a direct contractual

nexus between the client and the CCP when in practice this may not be possible.

- (f) A **multi-level structure** is one where a bank can centrally clear as an indirect client. This refers to the provision of clearing services to a bank that is itself a client and not a clearing member or other clearing client<sup>1184</sup>.
- (g) **Initial margin** is defined as a clearing member's or client's funded collateral posted to the CCP to mitigate the potential future exposure of the CCP to the clearing member arising from possible future changes in the value of transactions<sup>1185</sup>. In practice, initial margin may be a fairly standard minimum margin contribution based on the clearing member's status and projected trading volume. The definition of initial margin expressly excluded contributions in respect of mutualised loss sharing arrangements (i.e. where a clearing member uses initial margin to mutualise losses following a default by a clearing member)<sup>1186</sup>. This practice, which used to be common, results in the margin being treated as a default fund exposure<sup>1187</sup>. Initial margin also includes margin deposited in excess of the minimum amount required provided the CCP or (in the case of client margin) the clearing member may prevent withdrawal<sup>1188</sup>.
- (h) **Variation margin** means a clearing member's or client's funded collateral posted on a daily or intra-day basis to a CCP based on price movements in cleared transactions<sup>1189</sup>. Whilst daily or intra-day re-margining is certainly common, it is unclear to us whether it should be mandatory. For example, there may be materiality thresholds.
- (i) **Trade exposures** include the current and potential future exposure of a clearing member or a client to a CCP arising from OTC or exchange-traded derivatives, securities financing transactions, or initial margin contributions<sup>1190</sup>. Potential future exposure measures the risk that any given exposure may increase in size prior to the counterparty's default.
- (j) The **default fund** consists of clearing members' funded or unfunded contributions to, or underwriting of, a CCP's mutualised loss sharing arrangements. Basel III clarifies that the actual description used by a CCP is not determinative, but the substance of the arrangements<sup>1191</sup>. In practice, almost all CCPs require such contributions to ensure that should a clearing member or members default the loss is mutualised amongst those making use of the CCP's services. Historically, some CCPs had a separate designated default fund, while others had a contractual right to resort to all margin provided by clearing members. The Basel standard applies regardless of local practices or legal frameworks.

### *Capital requirements*

10.7.4 Banks must maintain adequate capital for their exposures to CCPs, and must consider if they need to hold capital in excess of the minimum set out in this section. This may be necessary if, for example, a bank:

- (a) has exposures to a CCP that give rise to more risky exposures;

- (b) is unclear if the CCP is a qualifying CCP or not; or
- (c) an external body (Basel III refers to the IMF Financial Sector Assessment Programme) has found material shortcomings in a CCP which have not been publicly addressed<sup>1192</sup>.

- 10.7.5 For banks that are clearing members they must assess through appropriate scenario analysis and stress testing whether the level of capital required to be held adequately addresses the inherent risks of those transactions. Such assessments must include potential future or contingent exposures by the CCP from default fund contributions and/or any commitments to take over or replace offsetting transactions from other clearing members should they default<sup>1193</sup>. This seems understandable, but one may wonder why such risks are not adequately taken into account under the capital adequacy framework. There are certain monitoring and internal reporting requirements<sup>1194</sup>.
- 10.7.6 The capital requirements distinguish between qualifying and non-qualifying CCPs. The definition of a “qualifying” CCP has already been set out.

#### *Non-qualifying CCP exposures*

- 10.7.7 The capital charge differs between trading exposures and contributions to the default fund of the CCP.
- 10.7.8 Trade exposures are risk-weighted using the standardised approach to credit risk based on the appropriate risk weight to each counterparty<sup>1195</sup>. The IRB approach cannot be used.
- 10.7.9 Default fund contributions are risk-weighted on a blanket 1250% basis (equivalent to a deduction from capital)<sup>1196</sup>. The default fund contribution, for this purpose, includes both funded and unfunded (i.e. agreed but not paid) contributions. In the case of unfunded commitments the bank’s national supervisor is to determine, through the Pillar 2 process, the amount to which the 1250% risk weight applies. This is curious as an unfunded commitment will be determined in accordance with the CCP’s internal rules. If a CCP can itself determine the amount of margin on a discretionary basis then the amount of the deduction, logically, should be whatever amount is set by the CCP from time to time.

#### *Qualifying CCPs*

- 10.7.10 The rules are considerably more complex.
- 10.7.11 The rules distinguish between trade exposures, client exposures, posted collateral and default fund contributions. We will take each of these in turn.
- 10.7.12 Only clearing members will normally have an exposure to the CCP’s default as non-clearing members CCR exposure will be on their exposure to the clearing member.



*Trade exposures*

- 10.7.13 If a bank is a clearing member and enters into trades for its own account then the CCR capital charge is 2%<sup>1197</sup>.
- 10.7.14 If the clearing member additionally offers clearing services to clients then a 2% risk weight applies based on the amount the clearing member is obligated to reimburse to its client(s)<sup>1198</sup>. This seems ambiguous as it is not clear if “clearing services to clients” means client clearing, transactions entered into as principal by the clearing member but on behalf of clients (so there is a back-to-back transaction with the customer) or both. Posted-collateral is subject to the treatment detailed below.
- 10.7.15 The exposure amount to which this 2% risk weight applies is calculated under the normal CCR framework<sup>1199</sup>. Provided the netting set does not contain any exotic derivatives or illiquid collateral, and there are no disputed trades, the margin period of risk may be under 20 days<sup>1200</sup>, subject to a floor of 10 days<sup>1201</sup>.

*Client exposures*

- 10.7.16 These rules apply to banks’ exposures to their clients in respect of centrally cleared transactions. Specifically, the rules apply to the following transactions:
- (a) a bank’s exposures to a clearing member if it is a client and the clearing member acts as a financial intermediary (in this case the Basel III text makes clear that a back-to-back transaction is covered)<sup>1202</sup>;
  - (b) a bank’s exposures where the bank is a client of a clearing member and the clearing member guarantees performance of the transaction<sup>1203</sup>; and
  - (c) exposures of lower-level clients to higher-level clients in a multi-level client structure if certain criteria are met<sup>1204</sup>.
- 10.7.17 This covers: traditional back-to-back contracts between the clearing member and its client bank, (ii) client clearing; and (iii) so-called “multi-level structures” (see above), insofar as different.
- 10.7.18 If the client bank is exposed to losses if its clearing member and another client of the clearing member both default the risk weight is 4%<sup>1205</sup>. If not, the transaction is treated as not centrally cleared and is instead subject to the CCR treatment under the framework applicable for un-cleared transactions<sup>1206</sup>.

*Posted collateral*

- 10.7.19 Any posted collateral is subject to the credit risk treatment or the market risk treatment that would apply under the credit risk framework for banking book transactions (standardised or IRB) and the market risk framework for trading book transactions<sup>1207</sup>. In other words, the bank is treated under both the credit risk and market risk framework as still being exposed to the posted collateral, which is logical as if the collateral becomes worthless the bank will face a direct credit risk or market risk loss (as the collateral would need to be replaced).

- 10.7.20 However, as there may be CCR losses in addition, this attracts a capital charge, both in the trading and banking books<sup>1208</sup>. There will be a risk of CCR losses in all cases where the collateral is not held in a bankruptcy remote SPV, but is, say, transferred to the CCP or to a custodian on its behalf<sup>1209</sup>.
- 10.7.21 The following risk weights apply:
- (a) banks that are clearing members apply a risk weight of 2% for client exposures;
  - (b) banks that are clients of a clearing member and are not protected from losses in the case that the clearing member and another client of the clearing member default apply a risk weight of 4% to their exposures; and
  - (c) banks that are clients of a clearing member that are not so exposed apply a risk weight of 2%<sup>1210</sup>.
- 10.7.22 Collateral held by a bankruptcy remote custodian for a CCP attracts no capital charge as the bank posting the collateral will not suffer loss if the CCP fails<sup>1211</sup>.

#### *Default fund exposures*

- 10.7.23 The capital charge for default fund exposures depends on whether the CCP segregates default fund contributions by product or exposure class. If the CCP does do this (meaning, say, that default fund contributions for SFTs cannot be used to satisfy losses on OTC derivatives) the formula and methodology described below applies on a product-class by product-class basis<sup>1212</sup>. If not, then no apportionment to separate asset classes can be made<sup>1213</sup>. Exposures to the default fund attract the approach set out in the following paragraphs<sup>1214</sup>.
- 10.7.24 The capital charge for default fund contributions depends on a risk sensitive formula that considers: (i) the size and quality of a qualifying CCP's financial resources; (ii) the CCR exposures of the CCP; and (iii) the application of the CCP's financing resources under the applicable (contractual or statutory) waterfall in the event of the default of one or more clearing members<sup>1215</sup>.
- 10.7.25 It is not necessary for the calculations described below to be performed by the bank if another party, such as the CCP, a regulator or other person with access to the relevant data is able to do so<sup>1216</sup>. However, to ensure the capital calculation is reliable minimum criteria must be met<sup>1217</sup>.
- 10.7.26 The bank clearing member's capital contribution is calculated in two steps: the hypothetical capital requirement of the CCP based on (i) the CCR exposures of the CCP to all of its clearing members and clients; and (ii) the capital requirement for the clearing member bank<sup>1218</sup>.
- 10.7.27 We will now describe these two calculations.

*Hypothetical capital requirement of the CCP*

- 10.7.28 It should be understood that this calculation has nothing to do with the actual capital adequacy requirement (if any) imposed on a CCP by its own regulator. It is a purely hypothetical calculation.
- 10.7.29 The first step in this process is to calculate the wholly notional capital requirement for the CCP ( $K_{CCP}$ ). This calculation is based on the CCP's CCR exposures to its clearing members and clients<sup>1219</sup>. The sole purpose of this calculation is to determine the capitalisation of the CCP's default fund contributions, and does not represent the CCP's actual capital requirement set by its supervisor<sup>1220</sup>.
- 10.7.30 In calculating  $K_{CCP}$  the following factors apply:<sup>1221</sup>
- (a) the risk weight = 20%;
  - (b) the capital ratio = 8%;
  - (c) CM means the clearing member of the CCP; and
  - (d)  $EAD_i$  = the exposure amount of the CCP to clearing member  $i$ <sup>1222</sup>.

10.7.31 The formula is calculated as follows:

$$K_{CCP} = \sum_{CM_i} EAD_i * RW * capital\ ratio^{1223}$$

- 10.7.32 The calculation of the notional capital requirement for the CCP is therefore equal to the sum of all exposures of each clearing member to the CCP multiplied by 20% multiplied by 8%. National supervisors may increase the 20% figure<sup>1224</sup>.
- 10.7.33 There are detailed rules governing the specific calculation.

*Capital requirement for clearing members*

- 10.7.34 This is the second part of the capital calculation. A complex equation applies which is set out below. The basis of this calculation is the amount of the CCP's own resources that it contributes towards the funding of defaults by clearing members. The idea is that the amount of the loss attributable to defaults by clearing members will be reduced to the extent that the CCP agrees to fund this loss by its own injection of capital in a default scenario. This will be described formally below.
- (a)  $K_{CMI}$  = the capital requirement on the default fund contribution of clearing member  $i$ ;
  - (b)  $DF_{CM}^{pref}$  = the total prefunded default fund contributions by clearing members;
  - (c)  $DF_{CCP}$  = the CCP's prefunded own resources contributed to the default waterfall if *pari passu* or junior to funded clearing member contributions; and

(d)  $DF_i^{\text{pref}}$  = the prefunded default fund contributions provided by clearing member  $i$ <sup>1225</sup>.

10.7.35 Based on the foregoing factors the notional capital charge for each clearing member  $I$  is calculated as follows:

$$K_{\text{CMI}} = \max\left(K_{\text{CCP}} * \left(\frac{DF_i^{\text{pref}}}{DF_{\text{CCP}} + DF_{\text{CM}}^{\text{pref}}}\right); 8\% * 2\% * DF_i^{\text{pref}}\right)^{1226}$$

10.7.36 The formula places a minimum risk weight under this calculation of 2%<sup>1227</sup>.

#### *Capital charge*

10.7.37 The consolidated Basel III text does not actually specify how the capital charge is to be calculated, which seems to be a mistake. It is therefore unclear if the capital charge is equal to the greater of the two figures calculated above or is their sum. The Basel III text does not provide any guidance on this matter, although approaching the matter from first principles, it would seem that only the maximum of the two amounts should be taken into account as representing the greatest loss that the bank could suffer should both the CCP and its clearing members all default.

#### *Floor*

10.7.38 There is a floor for both trade exposures and default fund exposures equal to the capital charge had those same exposures been to a non-qualifying CCP. In this case the capital charge for a non-qualifying CCP applies (see above)<sup>1228</sup>.

## 11. MARKET RISK

### 11.1 Introduction

- 11.1.1 The financial crisis was centred on losses made possible from a regulatory perspective by the 1996 Market Risk Amendment, that was retained, basically unamended, by the Basel II framework, and permitted banks to use their own value-at-risk (VaR) models to determine capital requirements. Most failures of financial institutions in the crisis were attributable to losses incurred in banks' "trading book" for market risks arising out of their trading book positions (e.g. proprietary trading). Unsurprisingly, in the development of Basel III searching attention has been given to what aspects of the 1996 standard went wrong. In fact, most of the criticisms of the standard were well known before the crisis in the relevant academic literature, but were dismissed as unlikely to be relevant in practice. The financial crisis disproved this approach. Unsurprisingly, the Basel Committee has adopted a new approach, that while theoretically superior as a measure of risk, suffers from possibly greater downsides than the former standard, in terms of data limitations and model risk.
- 11.1.2 The new models-based approach is supplemented by a new "standardised approach", that unlike its predecessor, is based extensively on banks' internal pricing models. Because of its complexity, and, some could say its impenetrability to those not familiar with the mathematics of quantitative risk management, this led, in a late amendment, to the 2019 decision that allowed the continued use of an amended form of the 1996 standardised approach, scaled up to reflect perceived deficiencies in the former in terms of risk measurement. Supervisory approval is required for both the new models-based approach and the simplified standardised approach.
- 11.1.3 Given the intention, and clear capital incentives, to adopt the revised internal models approach this will be described first. We follow with the revised standardised approach and then a description of the simplified standardised approach, which is not intended to be available to most internationally active banks, but reflects the Committee's acceptance that the Basel standards are applied more widely (especially in the European Union) to other banks. Discussion of the models-based approach first is also justified by the intention of the Committee that the standardised approach should offer a suitable fall-back for banks that fail, in whole or in part, to satisfy the new models-based approach, and is expressly intended to be compatible with it, unlike the 1996 standardised approach. Both approaches are heavily (perhaps too heavily) based on theories of quantitative risk management making a direct read of the Basel III text difficult to those without such a background, as well as acquaintance with risk models. Whether this is desirable given the need for senior management to understand risk and risk models only time will tell.
- 11.1.4 This lengthy chapter is organised as follows. We first outline the 1996 internal models-based approach (the Market Risk Amendment). This is followed by a description of the Basel Committee's criticisms of the Market Risk Amendment

in the light of the financial crisis. We consider, in brief, the relevant academic literature, including a 2011 publication (sadly, not updated since) by the Basel Committee, justifying a move from VaR to expected shortfall (ES) as a measure of risk. The new ES standard is then described followed by the new standardised approach and finally the simplified standardised approach. The difference in format in this chapter (which includes extensive discussion of the Basel consultative documents leading up to the new standard published in 2019) from earlier chapters is justified by the role market risk losses played in the financial crisis, as well as the scale of the changes made from the former regime. The degree of improvement actually made will only be revealed when the next financial crisis comes around, which is likely to take a different path to the last. The revisions to the market risk framework were originally intended to come into force much earlier, but were then pushed back, initially due to deficiencies in the proposed standard and now to January 2023 (due to the Covid-19 pandemic), 15 years after the outbreak of the financial crisis. The UK and the EU have announced that they will defer implementation to 2025.

- 11.1.5 Readers not interested in the origins of and limitations to VaR as a risk measure can skip the following sections and proceed directly to discussion of the Basel III standard.

## 11.2 The 1996 Market Risk Amendment

- 11.2.1 The discussion that follows will focus on the internal models-based approach used by most sophisticated banks to calculate capital charges for market risk. Basel I had been concerned with credit risk, being then the predominant risk applicable to banks in 1988. However, subsequent developments in the financial markets made it necessary to take account of the risks presented by banks' trading activities, especially in then new financial products such as derivatives<sup>1229</sup>. Basel I had adopted a very rough and ready set of rules but by the 1990s it seemed clear that a more sophisticated approach was called for. The choice made was, essentially, to rely on the concept of "value at risk" (VaR). This had been developed as a concept in the early 1990s and made popular as cutting edge technology in risk management with the publication by J.P Morgan of its Risk Metrics document in 1994 (subsequently updated), a simplified version of the bank's own internal capital model.
- 11.2.2 The basic idea behind VaR is very simple and appealing (and still remains so after the financial crisis). VaR determines the maximum loss a bank can expect to suffer based on a given "confidence level". The confidence level sets the number of occasions in which the maximum postulated loss may be expected to be exceeded over a specified period (which can be one day or any longer period the data set available to the bank can reasonably allow). If the confidence level is 95% and the period is one day then in 5 days out of 100 the loss may be greater than that postulated by the model. If, as the Basel Committee decided, the confidence level is 99% then the maximum loss will only be exceeded in one time period out of a hundred. The Committee opted for a 10 day "holding period", implying that trading positions could be liquidated or hedged over 10 trading days (two weeks). A 99% confidence level with a 10 day holding period implies that the maximum loss would be exceeded about once in every four years, assuming a normal distribution of losses (of which more later). As this was not considered to be sufficiently

prudent, national supervisors were required to set a “scaling factor”, essentially a multiplication factor, of three or more. Assuming a normal - or Gaussian - distribution of losses this seemed a very conservative capital measurement of potential losses, and if losses were in fact normally distributed in a crisis, meaning clustering around the mean, with no “fat tails” i.e. low risk but high impact events, it would have been.

- 11.2.3 It should be understood that, as originally developed by J.P Morgan, VaR was intended to be a day-to-day risk metric applied to the bank’s trading positions with a one day horizon. As designed, it was, and, in normal times remains, a good risk measure (which does not mean there are not better ones<sup>1230</sup>). Financial markets generally vary relatively little from day to day, so the likelihood of an extreme loss on any given day is low. (This is not to ignore periodic crises, of which the prime one before the Market Risk Amendment was adopted was the 1987 Stock Market crash, the causes of which remain debated<sup>1231</sup>). Hence, the assumption of normal distribution works well for a day-to-day measurement of risk.
- 11.2.4 The problem arises when VaR is used as a measure for regulatory capital requirements. Inevitably, regulators are more concerned about unlikely but severe events that may pose a serious risk to the soundness of individual institutions, or to the financial system as a whole (systemic risk). Thus the 95% confidence level was raised to 99% and the holding period - simulating the longest period for a bank to exit its holdings of tradable securities and derivatives - extended to 10 trading days. Hence, also, the scaling factor, which was set on a case-by-case basis by individual banking supervisors, contributing to widely varying VaR figures for the same asset held by different banks. All these decisions by the Basel Committee can be justified by a focus on real risks, and by a desire to ensure the banking sector was properly capitalised. Unfortunately the result was opacity, a non-level playing field, and when the financial crisis hit, a gross underestimation of actual bank solvency requirements, essentially caused by the interaction of three factors not taken into account expressly in the VaR model: a non-normal distribution of loss events, liquidity risk and the impact in a crisis of mark-to-market (or available for sale) accounting.
- 11.2.5 Capital adequacy has traditionally been about solvency based on real losses, as opposed to a catastrophic collapse in market liquidity, which traditionally was seen as capable of being addressed through the monetary policy of the central bank. Mark-to-market (or fair value) accounting also makes sense for assets held for short term trading purposes to profit from market price movements. In such cases, historic cost accounting (the main alternative) would seem irrelevant. However, a collapse in market liquidity combined with the effect of re-pricing based on market prices, or where unavailable, models, in a crisis produced a toxic mix, which when combined with other factors, triggered the 2008 financial crisis and ensuing global recession.
- 11.2.6 When applied to short-term risk management, VaR is effective. It also has the advantage of quantifying risk (within the selected confidence level) to a simple numerical figure that, conceptually, can be extended from market risk to other risks, such as operational risk and credit risk. This was the hope of its advocates, and when Basel II introduced the internal ratings-based

approach, this was widely seen as a precursor to adoption of credit risk models similar to VaR models for all regulatory capital requirements.

- 11.2.7 The Market Risk Amendment was deliberately not specific as to the specifics of the models allowed by banks to be used. Instead, it set both quantitative and qualitative criteria to be met, and relied on banks persuading their national supervisor that the proposed model was both conceptually sound and based on correct data. This should not necessarily be seen as a failing as the literature on VaR models shows that there are many ways to build such a model and that there is no *a priori* reason to prioritise one type of model over another, as conceptual advantages need to be weighed against data limitations, and possible model error. This reflects the common sense view that it is better to be approximately right than precisely wrong.
- 11.2.8 One common approach to VAR is to rely on historical data, weighted, if necessary, to give greater prominence to more recent - and presumably more relevant - data. More sophisticated parametric models relying on copulas are mathematically more likely to generate correct calculations of VaR. Unfortunately, they are also more prone to model error if the copulas are incorrectly calculated, and in the case of non-elliptical distributions, likely to lead to incorrect results unless such distributions are known in advance and the model is correctly calibrated to address them. Perfect information, often assumed by economic theory, would solve this, but unfortunately, as FA Hayek demonstrated<sup>1232</sup> such a state of affairs never has never existed, and models that make this assumption are practically useless.
- 11.2.9 Given data limitations, as well as lack of knowledge as to how market prices would perform in a crisis (especially, correlations), many VaR models, that were approved by regulators, relied on simplistic and, in the event, incorrect assumptions, such as normal distribution and Brownian (i.e. random) shifts that failed to take account of the fact that in the case of many financial instruments (especially, derivatives) there are “fat tails” i.e. low probability but high loss events that are far more likely than a normal distribution would allow.
- 11.2.10 Further, many financial instruments feature clustering effects, and in a crisis hitherto established correlations break down, liquidity vanishes, and market prices triggered by “fire sales” of assets in a thin market will, through mark-to-market accounting trigger exponential losses at other institutions holding the same or similar assets, triggering further fire-sales at lower prices. Where liquidity disappears, firms are required to mark-to-model, with all the uncertainties, and possibly, incentives to under estimate prices where no market actually exists. In 2007-2008 this was not solely an issue for well-known illiquid assets, such as super-senior and mezzanine tranches of re-securitisations of sub-prime mortgages, but of assets like commercial paper the liquidity of which simply vanished. The VaR numbers, translated through mark-to-market accounting in some cases (not all) grossly undervalued many of the assets held in banks’ “available for sale” portfolio, as a point in time market price did not factor in possible (and, in many cases, real) recovery in values after the crisis. A case in point is the administration of Lehman Brothers’ UK subsidiary where the holders of regulatory capital instruments are still litigating over the distribution of the approximately £5 billion surplus after all customers and senior creditors have been repaid<sup>1233</sup>. The Lehman



subsidiary was certainly cash flow insolvent once its parent company entered liquidation, but accounting rules that require the liquidation of a company that turns out to have billions of surplus assets after more than a decade of protracted insolvency proceedings and extensive litigation may be open to question.

- 11.2.11 A detailed description of the 1996 Market Risk amendment will not be provided, as the purpose of this publication is to describe the new framework that is scheduled to replace it in 2023.

### 11.3 The Concept of Market Risk

- 11.3.1 Market risks are, basically, the risks of a bank suffering losses (or making profits) as a result of changes in the value of financial instruments, exchange rates or commodity prices. The market risk framework only applies to financial instruments that are held for trading purposes where the bank is exposed to risk from changes in such prices, as well as FX and commodity risk in the banking book (as there is no banking book treatment). The most obvious example is proprietary trading in equities, bonds, and derivatives. If a bank purchases an equity stake as a long-term investment, as is common in countries like Germany and Japan, then the credit risk framework applies. The same applies where a bank makes a loan, or buys a bond for long-term investment purposes, or enters into a securities financing transaction (like a repo) for similar purposes.
- 11.3.2 In reality the definitions are stricter than that, and have been significantly tightened by Basel III, and will be considered below when considering the definition of the trading book. However, the basic reason for the different treatment is that in long-term transactions the main risk a bank is exposed to is credit risk, as the bank will only make a loss if the obligor defaults, the bank makes a provision, or accounts for an impairment to the value of the position, under its applicable accounting framework. A bank will not normally account for a loss if the daily share price changes in a company that it holds as a strategic investment, as such price movements are, in almost all cases, irrelevant.
- 11.3.3 Where, however, a bank actively trades equities, bonds or derivatives for its own account, then it will suffer a loss every time the price goes down and make a profit if it goes up. This does not mean that a trading position cannot also generate credit risk too. There is a risk of loss on bonds or equities of a sudden insolvency event happening while the asset is held on the bank's balance sheet. This risk must also be taken into account in the market risk capital charge (the term used is default capital risk or DRC). Credit risk on derivative and certain other positions with positive net value is taken into account through the capital charge for counterparty credit risk which has already been described in chapter 10.
- 11.3.4 Traditionally (and this remains the case under Basel III) the market value on positions held for trading purposes (i.e. the bank's trading book) is calculated daily based on the market value. This is also required by accounting standards. Profits and losses on trading may generate an effect on available capital through changes reflected in the profit and loss account, although the circumstances where profits can be treated as capital are described in the

chapter on the definition of capital. Losses must, in principle, always be deducted from core Tier 1 capital. The purpose of the market risk framework is then to take account not of actual losses or expected losses (which are addressed through the P&L account and the bank's policy on provisioning) but the potential for future losses as a result of falls in market values<sup>1234</sup>. Thus capital is only required for financial instruments with positive market value.

- 11.3.5 The same applies, in principle, to derivatives, although account must be taken of out-of-the money derivatives that may generate future losses from changes in market prices (as opposed to counterparty default). Thus an out-of-the money sold option may result in large losses if the market price of the underlying falls, making the option valuable to the counterparty and generating a loss when exercised. This differs from counterparty credit risk as the loss is wholly attributable to changes in the market value of the underlying. Equally, an in the money purchased option may lead to losses if the price falls before the expiry date making the option worthless. We have assumed for simplicity that the options in both cases are only exercisable on expiry, i.e. they are European options. Options exercisable at any time prior to expiry (American options) are more complicated, but the principle is the same, as if the value of a sold option increases there will be losses that will only be fully crystallised on exercise. Options that expire with the option being out of the money will generate no further loss as the option will simply not be exercised, which is why the maximum loss on a purchased option is limited to the premium paid, whereas on a sold option it is theoretically infinite.
- 11.3.6 Forward transactions, on the other hand, commit the parties to settle (whether in cash or in kind) at the pre-agreed market price. Swaps may generate daily profits or losses as the two assets being swapped e.g. a fixed for a floating interest rate may change, or as in an equity swap with the value of the equity. Credit default swaps (CDS) are different, and they are functionally equivalent to a sold option where the profit is capped at the premium paid by the counterparty, and the loss is capped at the amount payable on the default of the reference obligation, which, in the case of CDS documented under current standard ISDA documentation, will be calculated following an auction process after a determination by the ISDA Determinations Committee that a credit event has occurred. Clearly other possibilities exist and parties are free to contract on bespoke terms that do not reference the ISDA documentation, or make changes to it.
- 11.3.7 It will be seen from the above, which simplifies greatly, that the process of calculating the appropriate capital charge for unexpected losses is extremely complex, as the framework has to cope not just with instruments whose losses may be relatively simple to calculate, such as equities and bonds, where you normally just look at the market price, or forwards on such instruments, which behave the same way, but also instruments the value of which exhibit extensive "non linearities" i.e. derivatives whose value is not directly correlated to the price of the underlying. Options provide a good example, as a small change in the value of the underlying may trigger a much bigger change in the market value of the option.
- 11.3.8 The value of positions in foreign currencies and commodities held for trading purposes will move in accordance with daily market prices. Derivatives on

such instruments will exhibit the same characteristics as other derivatives, such as on bonds or equities.

#### *The development of VaR*

- 11.3.9 Over the years traders and risk managers developed various techniques for valuing, and trying to limit losses that trading activities could give rise to. It is not proposed to provide a history of the evolution of risk management, and the techniques that have been used, as this is set out in books on risk management as well as monographs dealing with pricing and trading specific instruments. Instead we will proceed directly to VaR. The idea behind VaR is very simple as it claims to reduce the maximum overall loss on a bank's trading book to a simple number in the bank's reporting currency across its whole portfolio. The concept was developed by J.P. Morgan, and published in 1994. A revised and refined version was released in 1996. The concept sought to measure the highest likely loss across a bank's trading portfolio over the next day. This reveals the two basic components of all VaR models:
- (a) a time horizon over which the losses are to be estimated. RiskMetrics, and many internal economic capital models, look at a one trading day period; and
  - (b) a percentage below 100% setting the probability of the maximum loss being exceeded.
- 11.3.10 The first is determined by the length of time over which the bank is concerned about the maximum likely loss materialising. The appropriate length of this period, which is essentially arbitrary, should be determined by reference to the *purpose* we are using the VaR model for. From a day-to-day risk-management perspective, or when setting daily position limits for traders, a one day period may be adequate. For more long-term decisions on portfolio strategy it is likely to be inadequate. In particular, if used as a measure of the maximum loss likely to be suffered if the bank wants to liquidate or completely hedge its entire trading portfolio at other than "fire sale" prices, a one day period could be a very poor indicator, especially if the positions are not perfectly liquid and the bank's positions are large.
- 11.3.11 The period of time over which one looks is referred to in VaR models as the "holding period".
- 11.3.12 The second factor used by all VaR models is referred to as the "confidence level" as it specifies the degree of certainty that the maximum likely loss will not be exceeded. A low percentage (say, 50%) would be useless as a risk management tool as losses would exceed the VaR on 50% of all trading days. Originally, most banks using VaR models for internal risk management purposes chose a confidence level of 95% which means the likely maximum loss will only be exceeded in five days out of one hundred trading days if a one day holding period is taken. If, on the other hand a 99.9% confidence level is taken, with the same holding period, then the likely maximum loss will only be exceeded in 1 out of 1000 trading days, which works out to approximately once in four years. In theory, the higher the confidence level the better the model is at predicting the maximum likely loss, as there will be fewer exceptions. However, there is a significant caveat. This is only true if the data set is big

enough and relevant, and the assumptions behind the model, such as correlations between movements in asset values, are in all material respects correct. If not, very high confidence levels are likely to produce results that are progressively more and more inaccurate, as the data may not exist (and for very high confidence levels certainly will not) and therefore the figures will have to be extrapolated from a much smaller data set based on models. In practice, there is a trade-off between the set confidence level and how likely in reality it will be accurate.

- 11.3.13 The choice between increasing the confidence level, the holding period, or both, to improve the measurement of risk is essentially a pragmatic one based on data limitations as well as the purpose which the model is intended to serve.
- 11.3.14 The Basel Committee chose a 99% confidence level, meaning that the maximum expected loss should only be exceeded 1% of the time over a ten day holding period. The choice of a ten day holding period was based on the assumption that a bank will be able to close-out or fully hedge the portfolio within ten trading days. As the instruments held in banks' trading books in 1996 consisted of mainly equities, fixed-income securities and relatively simple derivatives this does not seem unreasonable.
- 11.3.15 Then, to instil further conservatism in the VaR figures, national supervisors were required to apply a scaling factor of between three and four. Without the scaling factor, the VaR could lead to a loss exceeding the capital requirement about once in every four years<sup>1235</sup>, which was not thought sufficiently prudent. Assuming a scaling factor of four and a normal distribution such an event would happen less than once in the period since the Big Bang<sup>1236</sup>.
- 11.3.16 The Committee can be excused from not anticipating market developments up to the crisis eleven years later. Credit default swaps had been pioneered by J.P. Morgan in 1994 and the first synthetic CDO followed in 1997, also created by J.P Morgan, under the title of Broad Index Secured Trust Offering (BISTRO). Needless to say BISTROs referenced underlying commercial loans, bonds and municipal bonds, the risk characteristics of which were fairly well known, backed by decades of data, and investors were informed of the underlying pool of obligors. Also, the transaction was designed for J.P Morgan to obtain regulatory capital relief as opposed to actively trade credit risk. It was therefore an innovative credit risk hedging strategy.
- 11.3.17 The subsequent metamorphosis of BISTROs into sub-prime CDOs and even more complex and less understandable instruments such as CDOs of CDOs (CDOs squared, cubed, etc.) was perhaps an inevitable consequence of financial ingenuity and a search for apparently safe, but higher yielding securities at a time of historic low interest rates. Arbitraging capital charges between the banking book and the trading book by booking highly complex, poorly understood and untested financial instruments in the trading book when little actual trading took place was an unintended consequence. In practice, in the absence of market prices, positions were (as permitted) marked to model.

### *Limitations of VaR models*

- 11.3.18 It needs to be stressed that VaR was never designed as a means for banks to assess their regulatory requirements, as opposed to being a guide for banks when deciding how internally to manage market risk on their trading portfolio. The limitations of VaR as a regulatory measure of risk in the academic literature are summarised below, as well as described in the Basel Committee's publications leading up to the adoption of the final Basel III market risk standard. However, perhaps its greatest limitation as a regulatory measure of risk is that the confidence level only told you the most likely maximum loss (based on the given data set used by the bank) at the specified confidence level. What VaR cannot tell you is the likely loss in those cases where the VAR is exceeded (1% of cases under the 1996 Market Risk Amendment). The loss may be small or it may be sufficient to bankrupt the institution.
- 11.3.19 Simply put, VaR provides *absolutely no* information about states of the world outside the confidence level<sup>1237</sup>. And simply increasing the confidence level is not a solution either because of the inevitable data limitations. For example, had the Basel Committee set a 99.9% confidence level with a ten day holding period, assuming a Gaussian - or normal - distribution (with no scaling factor), implies a risk of losses exceeding that based on loss data that will occur perhaps once in 1000 years. No bank has ever had such a data set. Monti dei Paschi di Sienna is the oldest bank still existing in the world, and was founded as a pawn agency in 1472. However, even though it has records from its early activities, it would patently be absurd to use statistics taken from fifteenth century Sienna to price losses on shares or bonds in Italy today. Such data (if it exists) is simply irrelevant to the risks in trading financial instruments today.
- 11.3.20 As mentioned above, the Basel Committee required a ten day holding period. To meet this directly a bank would need 3000 trading days of data to directly estimate the regulatory VaR<sup>1238</sup>. Assuming 250 trading days per year this is a 12 year data set for all instruments included within the portfolio being modelled measured on a daily basis. Apart from the fact that very few institutions have such data sets for all instruments currently held in their trading book (some did not exist 12 years ago), it is questionable whether such old data would really tell us anything about the likely loss over the next ten days. Giving equal weight to all the data would result in the VaR being unresponsive to recent shifts in market volatilities or prices, as the new data would be overwhelmed by very old data resulting in an almost flat VaR, which is not a good risk measurement, whether for regulatory or other purposes. Of course, one can discount the weight of old data, but this may not provide any clear guide to what is happening in the market now, given the presence of probably irrelevant old data.
- 11.3.21 Where the data do not exist then it is necessary to imply such a data set from a more limited set of relevant data. While there are valid mathematical techniques for doing so, the higher the confidence level, the more the VaR will be dependent on whether extrapolations from such limited data are representative for the presumed distribution in all states of the world up to the chosen confidence level. Unless we know how representative the data used are, the mathematically generated figure is likely to tell us little about what would really happen in a crisis<sup>1239</sup>.

- 11.3.22 The solution to this problem adopted by the Basel Committee is the so-called square-root-of-time. This relies on a one day VaR multiplied by the square root of ten to estimate the ten day figure. This is simple and easy for banks as they calculate their VaR on a daily basis anyway. However, this rule only holds if it is assumed: firstly, all losses are normally distributed; secondly, volatility is independent over time; and thirdly, volatility is identical across all time periods<sup>1240</sup>. Danielsson argues that “all three assumptions are violated”<sup>1241</sup>. What happened in the financial crisis suggests he is correct.
- 11.3.23 The basic problem with using VaR as a *regulatory* measure to ensure financial soundness and stability is not with the mathematical models, or their correctness, which can be proven to be either valid or false, and mathematically false models would never be presented to regulators for approval. The real issue lies in the assumptions made that play such a large role in the outcome of the VaR calculation that, unless based on near-perfect data, and correct assumptions, may be meaningless. Hayek referred, in a speech in 1978 to the American Enterprise Institute (in another context) to the “beautiful systems of equations with which we can show in imagination what would happen if all these data were given to us. But we often forget that these data are purely fictitious, are not available to any single mind, and, therefore, do not lead us to an explanation of the process we observe”<sup>1242</sup>. Similar points have been made by economists working in a very different school of economic thought by Kay and King<sup>1243</sup> and Mandelbrot<sup>1244</sup>.
- 11.3.24 There are further assumptions made by most VaR models used to calculate regulatory capital requirements before the financial crisis: the distribution of losses is known and (usually) assumed to be normal, apparent correlations are real and do not change over time, price movements are random and do not exhibit sharp “jumps”, liquidity is constant and the market behaves in a panic in exactly the same way as in normal times. Of course, none of this is inherent in the nature of a VaR model. One can model any chosen distribution, assume price movements are correlated and not random, and factor in panics. Such a model will be just as sound mathematically as a VaR model that does none, or only some, of those things. So it comes down to the choices made by the modeller and the regulator when granting approval.
- 11.3.25 Unfortunately, assumptions such as normal distribution, etc. proved unfounded in the financial crisis. The distribution of losses can only be inferred from the best fit of the available *and relevant* data. This involves three judgments: (1) what counts as enough data, (2) what data to exclude as not relevant, or to be discounted compared to other, more recent or relevant, data and (3) which model best fits that data. Of course, if all that were known then there would be only one solution and the model would always be correct. But where this does not obtain, there may be multiple plausible solutions based on expert judgment. This is not because of the use of subjective criteria or biases, but simply that there are multiple ways of explaining the data, none of which can be proved *ex ante* to be superior to another.
- 11.3.26 The problem is exacerbated by the process by which correlations between different instruments are measured<sup>1245</sup>. There are many possibilities, including historical models (which look back as far as the modeller chooses), and alternatives include so-called “parametric” models, of which the best are probably those using copulas, which are mathematical correlations assumed

to exist between events and losses. Theoretically, parametric models are more accurate than historical simulations<sup>1246</sup>, but depend extensively on the assumptions made by the modeller. If those assumptions are wrong then the model is more likely to give an inaccurate result.

- 11.3.27 Secondly, market data show that the distribution of losses is rarely normal or Gaussian, especially in financial crises or panics<sup>1247</sup>. Instead, losses tend to exhibit fat tails, the more so in crises, meaning that high loss low probability events are factually more common than we might expect them to be. This can be addressed in a VaR model by presuming a non-normal distribution, but which of the almost infinite possible distributions between the mathematical extremes of normal and Cauchy distributions should be chosen, and should this be the same for all instruments and over all time periods? A Cauchy distribution is a statistical distribution with no mean or variance, but with a well-defined mode and median. As it is stable it can be calculated, and has the property of having much fatter tails, making it suitable for modelling extreme events.
- 11.3.28 A VaR model with a 99.9% confidence level, a ten day holding period, a scaling factor of four *and* assuming a Cauchy distribution would see the loss in excess of the bank's VaR capital requirement occurring not less than once in the history of the universe, but in less than one year<sup>1248</sup>, which is not particularly conservative if the purpose of regulation is to avoid bank failures or systemic risk. This shows the importance of being able accurately to choose the correct distribution, as well as measuring its stability or instability over time. In real life the true distribution is likely to lie somewhere in between the Gaussian and Cauchy distributions, and be nearer the Gaussian one in normal market conditions, but may approach closer to the Cauchy one in a market panic like the last quarter of 2008. Further, properly calibrated, VaR is generally very good at estimating losses at the mean, but if we are concerned about the tail loss it is practically useless as it provides no information at all on likely losses beyond the predefined confidence level.
- 11.3.29 As was seen the financial crisis, prices, in stressed situations, often do not move randomly, but may often exhibit "jumps", and liquidity, that is plentiful, as it was in 2005-2006 may disappear as happened in 2008 after the collapse of Lehman Brothers. Where liquidity evaporates then there may be no market price, or the market price may be driven by "fire sales" of assets by institutions (they need not be banks) that have to sell at any price (for example, funds with mandates only to hold investment grade instruments). The combination of illiquidity and mark-to-market accounting proved particularly toxic when institutions required, either by capital ratios or investment restrictions tied to a credit rating, were forced to dump illiquid assets, such as sub-prime mortgage re-securitisations, in a market with very few buyers, resulting in "fire sale" prices that were translated into further losses based on that market price at institutions marking prices to market, as accounting standards treated *all* market prices as the "fair" market price. This is a perfectly defensible and reasonable assumption in normal circumstances as historic cost makes no sense when valuing assets held for trading purposes. However, it can create a doom loop where each price fall triggers further sales. In a rational market, this process will end when well-capitalised market participants regard the market as having fallen too low and start buying bringing the panic to an end. However, if potential investors

don't have deep pockets, or are incentivised to short term actions, as their bonus or employment is based on avoiding losses, as opposed to taking a risk on potentially higher, but uncertain, profits, then this need not happen, which was the intellectual justification for the original Troubled Assets Relief Program (TARP) that would stabilise the market by buying up assets for which there was no real market<sup>1249</sup>.

- 11.3.30 Incentives may also play a role in determining risk if traders are not subject to adequate risk management and monitoring, given the current remuneration structure based on short-term performance (quarterly, annually), with a significant part in discretionary bonuses. For example, if a trader takes the same risks as most other traders then even if everyone makes a loss he is less likely to be fired than if he pursues a strategy that overall generates higher profits over the long-term through a few large profits with most days showing a loss. On the other hand a trader that adopts a strategy known to him to be likely to generate higher profits consistently, but with a very small risk of catastrophic losses is from his perspective (if not the bank's) preferable as he will then receive higher compensation or bonuses for his perceived superior performance, while if the loss materialises he will at worst get fired, and if the likelihood of the loss materialising is small may have moved on. It is possible that, the extremely risky trading strategy rogue trader Nick Leeson adopted in taking huge unauthorised positions based on the assumption that the Nikkei index would continue to trade at a very low level of volatility (through complex options known as straddle options) would have turned a significant profit if the Kobe earthquake had not happened, which triggered sharp movements in the Nikkei, and therefore vast losses on the options. Yet Leeson had a personal incentive to take the gamble as he had already made - and hidden through his control of the back office - vast losses so he had an incentive to take any risk to try to recover his position.
- 11.3.31 It may be asked what this has to do with VaR? As mentioned above, VaR tells you nothing about losses *beyond* the specified confidence level, which the Basel Committee set at 99%. Therefore, absent effective risk management of the 1% of cases where losses may exceed the likely maximum, traders may decide to adopt trading strategies that are more highly profitable 99% of the time but may result in a catastrophic loss 1% of the time. With a one day holding period this would probably not be a rational trading strategy (as the trader might be fired within six months when the loss occurred), but if the risk is seen as extremely unlikely it might. For example, in August 2007 the CFO of Goldman Sachs, David Viniar, said "We are seeing things that were 25-standard deviation moves, several days in a row"<sup>1250</sup>. How likely is such a loss occurring? Assuming a normal distribution, an 8 sigma standard deviation event will happen on any given day less than once in the period of time corresponding to the age of the universe. A 25 sigma standard deviation will occur once in 3.057 multiplied by 10<sup>135</sup> years. And Goldman Sachs was reporting such events occurring several days in a row, which is exponentially even less likely. It is, of course, possible that Goldman Sachs were just that unlucky, but it seems improbable. Moreover, changing the distribution to a non-normal one does not materially change the probability of a 25 standard deviation move in market prices<sup>1251</sup>. Nor was Goldman Sachs alone, as many other firms were reporting at the same time, and subsequently, massive losses on subprime mortgage re-securitisation positions.



- 11.3.32 The more plausible explanation for such price movements is that the models used were wrong in material respects. However, no trader, or risk manager, setting and monitoring position limits would be concerned by events believed to occur three times in  $10^{135}$  years, and would consider the risk to be zero.
- 11.3.33 None of the above means that VaR is useless as a risk measurement tool. If we are concerned about losses around the mean over a short term, it can play a very useful role in risk management. There may be better ones, but all have limitations as we shall see. Unless a better risk measurement is identified then having *much* knowledge is better than having none, and while intuition may be useful to a trader acting within defined and enforced position limits, betting the solvency of the bank on intuition would be reckless.

*Academic assessment of VaR as a risk measure*

- 11.3.34 It should be noted that most of the limitations on VaR as a risk management tool were known and acknowledged in the academic and risk management literature, including those favourable to the use of VaR, before it was retained in the Basel II standard in 2004. An early, and outspoken critic, Taleb, wrote in *Derivatives Strategy* in 1996 “[t]o me VaR is charlatanism because it tries to estimate something that is not scientifically possible to estimate, namely the risks of rare events. It gives people misleading precision that could lead to the build up of positions by hedgers. It lulls people to sleep. All that because there are financial stakes involved. To know the VaR you need to know the probabilities of events. To get the probabilities right you need to forecast volatilities and correlations. I spent close to a decade and a half trying to guess volatility, the volatility of volatility, and correlations ... [y]ou’re worse off relying on misleading information than on not having any information at all. Before VaR, we looked at the positions and understood them using what I call a non parametric method. After VaR, all we see is numbers, numbers that depend on strong assumptions”.
- 11.3.35 In a 1997 article in the same publication Taleb argued “VAR is the alibi bankers will give shareholders (and the bailing-out taxpayer) to show documented due diligence and will express that their blow-up came from *truly unforeseeable circumstances and events with low probability* - not from taking large risks they did not understand. ... I maintain that the due-diligence VAR toll will encourage untrained people to take misdirected risk with the shareholder’s, and ultimately the taxpayer’s, money” (emphasis added).
- 11.3.36 Jorion, in the same publication, countered that “VAR is an essential component of sound risk management systems. VAR gives an estimate of the potential losses due to market risks. In the end, the greatest benefit of VAR lies in the imposition of a structured methodology for critically thinking about risk. Institutions that go through the process of computing their VAR are forced to confront their exposure to financial risks and to set up a proper risk management function. Thus the process of getting to VAR may be as important as the number itself”.
- 11.3.37 Jorion’s book on *Value at Risk* has so far gone through three editions<sup>1252</sup>. In his conclusion he writes “VAR is no panacea. As we have seen, VAR makes no attempt to measure the losses beyond the specified limit. Even with a 99 percent confidence interval, unusual events happen, and they sometimes do

so with a vengeance. ... While VAR techniques are firmly grounded on a scientific basis, their interpretation remains more of an art than a science. Thus VAR should be considered only as a first-order approximation. The fact that the value is generated from a statistical method should not hide the fact that it is only an estimate. Users should not be lulled into a state of complacency but rather recognise the limitations of VAR, which have been amply documented in this book. As Steve Thieke, chairman of J.P. Morgan's risk management committee says. 'There has to come a point when this stops being a risk management methodology and becomes a management issue - what is the experience of the people in this business, and the firm's tolerance for risk'<sup>1253</sup>.

- 11.3.38 Jorion is supportive of "[a]ppropriate use of VAR"<sup>1254</sup> and wrote that "[s]tudies of bank portfolios based on historical data have shown that while the 99 percent VAR is often exceeded, a multiplier of 3 provides adequate protection against extreme losses" citing a Basel Committee publication in 1999 focussing on the 1998 Asian and Russian financial crises<sup>1255</sup>. That said, his focus is not on appropriate regulatory standards but quantitative internal risk management at banks.
- 11.3.39 Jorion also acknowledges the argument that as VaR totally ignores liquidity, "faced with binding VAR-based capital requirement, a 'bank is then faced with two choices: put in extra capital or reduce its positions, whatever and wherever they may be. This is what happened last autumn'<sup>1256</sup>. In turn, these forced sales depress prices, causing increased volatility, which further feeds into VAR. This is the vicious-circle hypothesis advanced by Persaud"<sup>1257</sup>. Jorion accepted that "[t]his line or argument should be a serious source of concern given the generalized trend towards risk-sensitive capital adequacy requirements", but considered the evidence in their support "anecdotal" and "[t]o be valid, this explanation requires most VAR-constrained institutions to start from similar positions"<sup>1258</sup>. He concluded that "there is no empirical evidence to support this theory"<sup>1259</sup>. Factually, this was true of the financial turbulence of the later 1990s, although the Federal Reserve Bank considered the failure of the Long Term Capital Management hedge fund to pose sufficient systemic risk to justify an orchestrated bail-out by the private sector. None of the major financial institutions that failed in the financial crisis did so because of VaR capital constraints - indeed the most high profile failures such as Northern Rock, Bear Stearns and Lehman Brothers exceeded their regulatory capital requirement until the day they failed. It was a lack of *liquidity* and not capital that brought them down.
- 11.3.40 As VaR under the Basel standards ignored liquidity we are not aware of a more recent example of the doom-loop operating in the way referred to by Jorion. However, the doom-loop certainly did occur if we move the focus from capital to liquidity<sup>1260</sup>. But as VaR was never designed to address liquidity risk this is not really a valid criticism of VaR or its regulatory application.
- 11.3.41 The collapse of Long Term Capital Management may perhaps better be seen as a case study in poor risk management. Jorion ascribes it mainly to "its inability to manage its risk" due "in no small part to the fact that LTCM's trades were rather undiversified" and that "it did not foresee that it would be unable to raise new funds as its performance dived"<sup>1261</sup>. Shin regards the fall of LTCM as being due to "the endogeneity of correlations [between asset

prices], and the pitfalls of relying on historical correlations as a guide to portfolio choice, especially when high levels of leverage are contemplated”<sup>1262</sup>. Both explanations may be valid, although neither proves VaR to be ultimately flawed as making unwarranted assumptions about factors that are not integrated into a risk model may be a failure of risk management (and LTCM, like Barings before, exhibited that). However, it does not mean that VaR is wrong for not doing a task it was not designed for.

- 11.3.42 The limitations on historical correlations highlighted by Shin are well known in the literature, and are not the only - or theoretically best - way of modelling market risk. They may, however, be the simplest<sup>1263</sup>. As Dowd writes “[w]e should never rely on non-parametric methods [such as historical simulation] alone”<sup>1264</sup>.
- 11.3.43 Jorion was certainly aware of the importance of liquidity risk and devoted a chapter to it identifying both asset liquidity risk (where changes in liquidity affect the price of assets traded in thin markets) as well as funding liquidity risk (where due to changing conditions leveraged institutions are unable to raise funding against the provision of collateral)<sup>1265</sup>. He proposed some possible solutions, including liquidity-adjusted VaR measures, such as incorporating bid-ask spread effects and extending the holding period for illiquid positions, concluding that while there is no clear answer “the main basis of this analysis is not so much to come up with one summary risk number but rather to provide a systematic framework for thinking about the interactions among market risk, asset liquidity risk, and liquidity funding risk”<sup>1266</sup>.
- 11.3.44 The importance of banks addressing liquidity risk is now clear<sup>1267</sup>, as a lack of liquidity was the *proximate* (if not underlying) cause of failure in many recent cases including Enron<sup>1268</sup>, Long Term Capital Management<sup>1269</sup>, Northern Rock<sup>1270</sup>, Bear Stearns<sup>1271</sup>, Lehman Brothers<sup>1272</sup>, RBS<sup>1273</sup> and perhaps others. But this is far removed from the limitations of VaR. Nor is this to deny there were other more fundamental factors in play in the collapse of those institutions.
- 11.3.45 Dowd’s first two books on VaR seem broadly<sup>1274</sup> accepting of VaR<sup>1275</sup> as a risk measure<sup>1276</sup>, although in the second edition of *Measuring Market Risk* he sees the main problems arising in model risk i.e. “inadequacies in our risk models”<sup>1277</sup>. His prescient conclusion was:

“Model risk is one of the most important and least appreciated areas of market risk measurement. We go about our work in risk management as if we know a lot that we actually don’t; we often treat our models as if they are correct, we might treat parameters as if they are known, and so on. And yet in the strict sense of the word we actually *know* very little at all. Instead, we only ever work with assumptions and have no choice but to do so. However, it is then all too easy to fall into the trap of starting to think of our assumptions as if they were true knowledge. We are particularly vulnerable to this trap because it is a basic human characteristic to seek confirmation of our beliefs: we all want the world to confirm our views of it, and we tend to brush aside inconvenient evidence that we might have got it wrong. ... Ultimately, model risk is like the proverbial ghost at the banquet - an unwelcome guest, but one that we would be very unwise to ignore”<sup>1278</sup>.

- 11.3.46 A more critical assessment of VaR was provided in a paper prepared by eminent economists submitted to the Basel Committee as *An Academic Response to Basel II*<sup>1279</sup> in 2001. In respect of VaR, after stating criticisms already noted above, the authors write “VaR models are not robust. They do not provide accurate and consistent risk forecasts across different assets, time horizons and risk levels within the same asset class. Moreover, estimates by Danielsson (2000) show that VaR forecasts are almost as volatile as returns themselves”<sup>1280</sup>. The Executive Summary states in its first bullet point “Value-at-Risk can destabilise an economy and induce crashes when they would not otherwise occur”<sup>1281</sup>. VaR models are “problematic in two senses. First, by failing to acknowledge the endogeneity of risk and liquidity at the systemic level they produce inaccurate volatility estimates. Second, by encouraging all market participants to employ similar risk modelling techniques regulation renders them more homogeneous in risk-aversion and trading strategies, thus rendering the financial system less stable”<sup>1282</sup>. The Introduction concludes “Reconsider before it is too late”<sup>1283</sup>. Subsequently, as noted below, Danielsson appears to have changed his mind on the failures of VaR.
- 11.3.47 A further influential criticism of VaR was advanced by Artzer et al. in a paper entitled *Coherent Measures of Risk*<sup>1284</sup>. This article presents a theory of “coherent” measures of risk. Artzer et al. posit four requirements for a measure of risk to be coherent. The only one we will consider here is that it is “subadditive” i.e. that “a merger [of portfolios of assets] does not create extra risk”<sup>1285</sup>. The authors prove that VaR does not satisfy this test as a combination of two separate portfolios (say the trading book of a bank in London and New York) can, under VaR, result in a lower number than the sum of the two separate portfolios calculated independently. Secondly, they show that VaR can result in situations where a highly concentrated portfolio generates a lower number than a well-diversified one, violating the principle that diversification should reduce risk<sup>1286</sup>, although this is not necessarily true, and may actually increase risks<sup>1287</sup>.
- 11.3.48 McNeil et al.<sup>1288</sup> conclude that “VaR is not subadditive in general” and “measuring risks with VaR can lead to nonsensical results”, although “VaR is subadditive in the idealized situation where all portfolios can be represented as linear combinations of the same set of underlying elliptically distributed risk factors ... We have seen ... that an elliptical model may be a reasonable approximate model for various kinds of risk-factor data, such as stock or exchange-rate returns”<sup>1289</sup>. An “elliptical distribution” is a family of distributions that include “normal” or Gaussian distributions, as well as many other distributions with much fatter tails, as well as potentially skewedness, such as Cauchy distributions, and t-distributions, which conform to certain specified properties.
- 11.3.49 The essential question, on which academics differ, is not whether the absence of subadditivity of VaR is correct, except where distributions of the financial instruments are elliptical, but whether it matters in the real world<sup>1290</sup>, and further, if it does, whether distributions of losses on financial instruments are generally elliptical<sup>1291</sup>. This is clearly a factual question<sup>1292</sup>. Doubtless the debate will continue.
- 11.3.50 On the other hand, Danielsson et al. in *Subadditivity Re-Examined: the Case for Value-at-Risk*<sup>1293</sup> argues that when focussing on the tails (low risk high

impact events) of heavily tailed assets “VaR is subadditive in the tails, at probabilities that are most relevant for practical applications. ... The results suggest that there is a strong case for using VaR, and it is not necessary to consider other risk measures solely for reasons of coherence”<sup>1294</sup>. For Danielsson, VaR works where it is most important for risk management purposes. This is also a factual question. If correct, then it may raise questions about the decision of the Basel Committee to adopt Expected Shortfall (ES) given its known limitations (including incalculability in many cases, which is why, presumably, the Committee still assigns a material role to VaR under the Basel III framework).

#### *Why did the Basel Committee choose VaR?*

11.3.51 Given the criticisms of VaR outlined above, it may be asked why the Basel Committee adopted the Market Risk Amendment in 1996, implemented it in 1998 and retained it in 2006 as part of Basel II. Perhaps the best place to start is Charles Goodhart’s analysis in his semi-official history *The Basel Committee on Banking Supervision: a History of the Early Years*<sup>1295</sup> based on partial access to the Committee’s archives<sup>1296</sup>. He traces the recognition of VaR models in the Market Risk Amendment to a recognition by the Committee that:

“it had somehow failed to take notice, or sufficient account, of the considerable advances being achieved by the major international banks on modelling their own internal risk. The banks were now applying both up-to-date academic (portfolio) theory and empirical measures of risk, for example based on historical data on volatilities and correlations. The [original] BCBS proposals had no backing in either theory or empirical evidence. The BCBS had been looking inward within the regulatory community, rather than outward to the innovations in risk modelling achieved by the major banks. Admittedly the adoption of these new risk measures, generally based on ‘value at risk’ (VaR) measures, had only occurred recently, and the pace of innovation had been swift, but how and why bank supervisors, or at least those represented at the BCBS, appeared to have become so out of touch with banking best practice, is not easy to understand”<sup>1297</sup>.

11.3.52 Goodhart added:

“To their credit, however, officials at the BCBS immediately recognised both the validity of the banks’ complaints about the consultative document, the superiority of the banks’ own techniques and the need for regulators to learn and master the new modelling techniques. It is always difficult for any set of authorities to eat ‘humble-pie’ and to accept external criticism, and it is praiseworthy that the BCBS did so, though admittedly more openly so in their internal papers than in their public response”<sup>1298</sup>.

11.3.53 The Basel Committee in 1994 set up a Models Task Force which “found the work of the major international banks in assessing their own market risk to be impressive, and far in advance of their own ‘building blocks’ approach”<sup>1299</sup>. He concludes:

“The Market Risk Amendment was, in the end, seen as a considerable success for the BCBS. ... Even so, this exercise also marked the point at which the BCBS

began to become more influenced by the technical modelling expertise of the large international banks”<sup>1300</sup>.

11.3.54 Goodhart seems to be arguing that faced with their limited knowledge the members of the Committee did their best by learning from market practice.

11.3.55 However, in a later chapter on *The BCBS and the Social Sciences*, he writes more critically, relying on hindsight derived from the experience of the financial crisis. Discussing the Market Risk Amendment he adds:

“Unfortunately, the regulators, having been persuaded of the better analytical foundations of the banks’ VaR models, did not fully appreciate their limitations from the viewpoint of regulatory objectives. Co-variances and correlations that determine portfolio risk and VaRs are not stable over time. In particular, during a crisis co-variances and correlations that were, under all normal conditions, low would suddenly rise dramatically towards unity. If one based risk estimates on behaviour during such normal times, for example relating to the last 250 days, and a crisis strikes (as at the end of September 2008 or August 2008 [surely 2007]), then one can, and does, easily find events occurring all too often that appear, on the basis of normal times, to be totally impossible, for example a 25 standard deviation effect.

What that means is that standard VaR models, though of great use as a management tool during normal times, give regulators little feeling for what may be flung at them if a crisis should occur, or in jargon terms past experience provides little indication of future tail risk. What one can see is what actually happened during the occasional sporadic crises that have punctured past history.

The regulators did have some appreciation that standard VaR-type models were only a fair-weather guide, whereas they were supposed to protect the system against bad weather. They responded in two generic ways. First, they would introduce multiplication factors, so whatever the VaR figure turned out to be, the commercial bank would have to hold capital multiplied by X, but generally the choice of X could only be done by guesswork. The commercial banks would protest if X was so large as to be commercially damaging for them.

Secondly, if VaR-type models were only fair-weather guides, why not use the occasional examples of crises and whatever other crisis scenario regulators might think up to examine how banks might fare in such circumstances, in other words to use stress tests as a means of supplementing CARs [capital adequacy ratios] based on other approaches. One problem is that crises are not easily foreseeable; if they were, they would not happen. Virtually no one foresaw the likelihood or the path of the crisis that began in August 2007. Had regulators asked banks, prior to that time, to assume a scenario in which most wholesale financial markets closed, this would have been too improbable to be worthy of consideration”<sup>1301</sup>.

11.3.56 Goodhart concludes the chapter with thoughts on how the Basel system of capital adequacy could be reformed.

- 11.3.57 As Goodhart’s book expressly does not deal with events after 1997, it provides no evidence for the decision of the Basel Committee not to revise the Market Risk Amendment as part of its lengthy work on Basel II. Perhaps the most likely explanation is that other aspects of the framework were in more urgent need of reform, VaR models seemed to be working well in practice, and no empirical evidence had yet come to light (as opposed to academic criticisms) that the assumptions were unsound as none of the financial crises in the intervening period had involved a banking crisis, or could reasonably be attributed to the regulation of market risk, and, on their part, the banks were content with their VaR models, and had not developed new or more sophisticated ones, unlike for credit risk and operational risk which were the prime focus of Basel II.
- 11.3.58 The theoretical underpinnings (and limitations) of VaR seemed to remain broadly intact, and the criticism that VaR was not a “coherent” measure of risk was only published in 1999 when work on Basel II was well underway, and while accepted as theoretically correct by academics, its implications had not (and still yet have) to be worked out in terms of real results. A committee of regulators and central bankers, with limited resources and time, and a focus on what were perceived to be the major issues in upgrading a global standard of prudential regulation, cannot reasonably be faulted in not launching a major reform of rules that seemed to be working well when the deficiencies of Basel I were so manifest. As Goodhart argues above, no one would have anticipated in 2006 that two years later wholesale funding markets would close as a result of a chain reaction to a problem in securitised mortgage loans.
- 11.3.59 Criticisms based on hindsight may be useful in devising new regulatory standards but are usually unfair when evaluating decisions made at the time unless the particular matters either were or ought to have been known to the decision-makers concerned, and were of a sufficient magnitude to have required the time of the members of the Committee. Most of the major *theoretical limitations* with VaR were known in 1998 and 2006, but the way they would play out in a crisis that virtually no one foresaw, and seemed so unlikely as to be not relevant, is not evidence that the regulators did not do their best, that they should have come up with a better measure when their initial attempt at devising standards for market risk had been a failure, or that they were “captured” by the banking industry, as opposed to being influenced by bank best practice<sup>1302</sup>. Critics fail to explain what the Basel Committee *should* have done instead. That the new chosen metric of market risk in Basel III, which is discussed in detail below, Expected Shortfall, was also known in academic literature in 1996, and had actually been proposed in a research report by JP Morgan before VaR in 1993, is not really relevant. VaR was the standard that all the most sophisticated banks were using at the time, and was clearly superior to the original proposals devised by the Basel Committee. There was no clearly better model on the table, and the jury is out on whether ES will, in fact, prove superior to VaR in a future financial crisis, as opposed to in theoretical models.

#### 11.4 The Basel Committee Responds to the Financial Crisis

- 11.4.1 Given the failures that have been summarised above it is unsurprising that the Basel Committee engaged in a very lengthy iterative process with banks

involving the publication of four main consultation papers before the new rules in Basel III for market risk were finalised in 2019. However, as a preliminary step the Basel Committee implemented a number of measures in 2010 as a stop-gap until a final solution could be found. This is usually referred to in the literature as Basel 2.5. As these measures are either superseded or have been amended by Basel III we will not consider them further here.

- 11.4.2 The Basel Committee's response started in January 2011 with a (selective) review of the academic literature, followed by a first consultative document in May 2012 and a second consultative document in October 2013. A final standard was released in 2016, which was then subject to two further consultations and then finalised in 2019. These documents were complemented by various quantitative impact studies (QISs), the results of which were also published, and informed the development of the new standards. It seems reasonable to conclude from the above that the Committee has sought to seriously engage with the shortcomings exposed by the academic literature, while seeking to engage actively with banks' experience in the financial crisis as well as the views of other stakeholders, with a more pronounced transparency than is often seen.

#### *The Basel Committee Reviews the Academic Literature*

- 11.4.3 The first major publication by the Committee was *Messages from the Academic Literature on Risk Measurement for the Trading Book* published in January 2011. The five lessons drawn by the Committee from the literature reviewed will be summarised below and are mainly taken from the Executive Summary:

- (a) On VaR models, there is no unique solution to the problem of the appropriate horizon for risk measurement (i.e. the holding period), as it depends on characteristics of the asset portfolio. The square root of time rule used for deriving a ten day holding period has been found to be inaccurate in many studies, although there is no widely accepted alternative. There are also difficulties with volatility over time and backtesting where only few violations are recorded.
- (b) VaR does not address liquidity. The literature distinguishes between endogenous and exogenous liquidity, as well as normal and stressed liquidity. Exogenous liquidity (i.e. average transaction costs) can be captured by a liquidity-adjusted VaR. Endogenous liquidity (i.e. the price impact of a liquidation of specific positions) depends on trade size as well as whether other market participants are liquidating their positions at the same time. However, the practical implications of liquidity in the trading book have yet to be developed.
- (c) The lack of subadditivity (as discussed above) of VaR is relevant in practice. This conclusion seems based on a 2007 paper by Degen et al.<sup>1303</sup> on operational risk modelling. The other studies cited, cited in the body of the report, many of which have been referred to above, set out conditions under which VaR is subadditive, except in cases considered "artificial"<sup>1304</sup>, or where there is no other coherent and practicable alternative<sup>1305</sup>. Expected shortfall is, however, stated to be a coherent



risk measure, which has been generally recognised since the idea of coherence was developed in 1999. It also seeks to take account of losses beyond the specified confidence level (which is also correct).

- (d) Stress testing would better be integrated into the risk modelling framework. The “stressed VaR” adopted in Basel 2.5 (see above) has not been analysed in the literature but in the Committee’s view may not lead to an accurate assessment of risk in a stressed environment.
- (e) Unified measures of risk are generally preferable as opposed to compartmentalised measures (e.g. adding the VaR on market risk to the VaR on credit risk), as the addition of separately calculated VaRs only is conservative in certain circumstances: “it is always questionable to calculate different risks for the *same* portfolio in a compartmentalised fashion and to hope that adding up the compartmentalised measures will be a conservative estimate of the true risk”<sup>1306</sup>.
- (f) VaR measures tend to be pro-cyclical and can exacerbate the economic cycle, although the literature does not offer convincing solutions as to how such risks could be addressed in the regulatory framework. VaR models could also induce herd-like behaviour in booms and busts.

#### *The first consultative document*

11.4.4 The Basel Committee followed this with its consultative document on the *Fundamental Review of the Trading Book* in May 2012. This is a complex publication and we will consider here its considerations of the shortcomings of the 1996 Market Risk Amendment, the weaknesses of the Basel 2.5 changes, the basis on which a new market risk framework should be constructed and proposals for a revised models-based approach. The approach to these issues is inevitably selective. The development of the new standardised approach will be considered in its context. It should be noted that in a late amendment after the market risk framework had supposedly been finalised an approach based-on the old standardised approach was re-introduced, essentially due to a recognition that some banks with limited trading books could not calculate the new standardised charges at a reasonable cost.

#### *The failings revealed by the financial crisis*

11.4.5 The concrete lessons drawn from the financial crisis are set out in Annex 1 of the publication. This identified three key failings:

- (a) weaknesses in the design of the framework;
- (b) weaknesses in risk management methodology; and
- (c) weaknesses in valuation methodologies.

11.4.6 These will be described in turn.

*Weaknesses in the design of the framework*

- 11.4.7 Concerning the design of the market risk framework, the Committee identified three issues: firstly, the role of the boundary between the banking book (subject to the credit risk framework) and the market risk framework; secondly, significant differences between the models-based approach and the standardised approach; thirdly, the absence of a credible option for the withdrawal of model approval.
- 11.4.8 The role of the boundary between the trading book and the banking book is “an operational one. It seeks to classify instruments into a capital regime that is equipped to deliver the appropriate level of capital given the nature of the risks that regulators choose to capitalise under Pillar 1”<sup>1307</sup>. The document identified three “features of the boundary”<sup>1308</sup> that were problematic:
- (a) The different capital charges for instruments held in the trading book and the banking book created incentives for banks to arbitrage the boundary, given the test for allocation was a subjective one based on *intent* to trade, rather than *whether* actual trading took place. The differences in capital treatment were justified by the assumption that trading book positions were liquid and could easily be traded out of.
  - (b) As the test for inclusion in the trading book was one of subjective intent, banks could arbitrage the boundary by choosing to place instruments that were inherently hard to trade or held for long-term investment, into the trading book by claiming that they intended to trade them. Equally, during the crisis, some banks reallocated positions that had become illiquid and subject to extreme price volatility on a mark-to-market basis to the banking book preventing further losses unless the instruments became impaired.
  - (c) The interaction with accounting standards caused problems. While all assets that are fair valued through the profit and loss account and available-for-sale must be marked-to-market daily, not all such positions were required to be held in the trading book, such as options that were fair valued. Under Basel II fair valued gains and losses were not automatically taken forward to core Tier 1 capital, so fair value losses would avoid an immediate hit to capital.
- 11.4.9 The second main criticism identified by the Committee is the significant difference between capital calculations under the standardised and VaR models-based approach. “The design of the current framework does not embed a clear link between models-based and standardised approaches, either in terms of calibration or in terms of the conceptual approach to risk management. Historically, the two approaches have been seen as catering to different sets of banks”<sup>1309</sup>. This was seen as acceptable “partly in the belief that there should be significant capital benefits for the models-based approach. This has been justified on the basis that it is appropriate to provide regulatory capital incentive, over and above the private incentives that banks should have on their own, for good risk management”<sup>1310</sup>.

11.4.10 The third main criticism follows: “a key weakness of the design of the current framework has been the lack of credible options for the withdrawal of models approval”, particularly in stressed periods<sup>1311</sup>.

*Weaknesses in risk measurement*

11.4.11 In this section we will discuss only weaknesses identified in respect of the models-based approach.

11.4.12 The Committee questioned whether calibration on a 99% confidence level based on a ten day holding period “meets prudential objectives”<sup>1312</sup>. The following limitations are noted in the document:

- (a) VaR does not adequately capture credit risk in the trading book. The market for traded credit grew significantly since 1996 (e.g. CDOs and credit default swaps). Basel attempted to address this partially with the incremental risk charge in Basel 2.5 which is abolished under Basel III so will not be discussed further.
- (b) VaR models proved inadequate in capturing *ex ante* market liquidity risk: “banks were often unable to exit or hedge certain trading positions in a short time period due to market illiquidity. Moreover, the sharp rise in liquidity premia at the height of the crisis led to banks incurring substantial mark-to-market losses on a range of positions”<sup>1313</sup>. (This is obviously true, but VaR models were never designed or required to consider liquidity risk). Although liquidity and market risks are related they are not the same thing, and pre-crisis liquidity was taken as a given and not something to be modelled.
- (c) Banks had incentives to take on tail risk: “[b]y not looking beyond the 99<sup>th</sup> percentile, VaR - and hence regulatory capital requirements - fails to capture so-called ‘tail risks’”<sup>1314</sup>. (As we have seen this is a design feature of VaR, but nothing prevented banks’ *risk management* internally from considering such risks).
- (d) VaR models did not adequately capture basis risk. “Ahead of the crisis, internal models often did not capture the basis risk between market parameters as they were often ‘mapped’ to the same underlying risk factor”<sup>1315</sup>, such as a long position in a corporate bond mapped by equivalent CDS protection, which could deliver a zero VaR. (VaR models were not required to have this effect). “More broadly, the entire framework was based on the estimates of correlations derived from historical data based on ‘normal’ market conditions”<sup>1316</sup>. (Again, this is not a necessary feature of VaR models if the data set includes non-normal conditions. The problem was that there had been no recent banking crises in the US or Europe, and no regulatory requirement to take such risks into account).
- (e) VaR models relied on a bank-specific notion of risk: “individual banks’ risk assessments might not be adequate from the perspective of the banking system as a whole. A clear manifestation of that was the lack of incorporation of market liquidity risk”<sup>1317</sup>.

- (f) VaR-based capital charges are pro-cyclical, allowing banks to accumulate more risk in the boom, and being under pressure to shed risk by exiting positions in the crisis contributing to further asset price falls and liquidity. (This is again true, but applies equally to credit risk as all risk-based measurements that are not fixed once and for all – as under Basel I – are pro-cyclical. There is little evidence of major banks shedding risky positions in the crisis solely because of regulatory capital constraints. The main difference between pro-cyclicality in the trading book, as opposed to the banking book, lies in the difference in accounting treatment: historic cost versus mark-to-market/fair value, even if there are some exceptions as noted above).
- (g) There were a large number of backtesting exceptions (i.e. breaches of the VaR figure on the next trading day) during the financial crisis. This led to further work by the Trading Book Group, whose main conclusions were that “VaR models did not perform adequately during the crisis”<sup>1318</sup>, there were two clear peaks in August 2007 and October 2008 corresponding to “the significant rise in inter-bank funding spreads” in the summer of 2007 and “the fall-out of the Lehman Brothers collapse in autumn 2008”<sup>1319</sup>, “[t]he main cause of exceptions were interest rate movements”<sup>1320</sup>, and, finally, “many banks did not regularly update time series data and some key risk factors driving the observed losses were not incorporated into their VaR models”<sup>1321</sup>.

#### *Weaknesses in valuation practices*

- 11.4.13 The report notes that the “crisis served to highlight the importance of valuation practices, especially of complex or illiquid financial instruments in times of stress, for the regulatory assessment of capital adequacy”<sup>1322</sup>.
- 11.4.14 Perhaps unsurprisingly, the consultative document does not mention the possibility of regulatory failure either in the design of the Market Risk Amendment, or failures by leading regulators. Purely by way of example, the FSA decided on 29 June 2007 to approve Northern Rock’s application for a waiver to use the advanced IRB approach to credit risk that significantly reduced its capital requirements. Northern Rock then declared a 30.3% increase in its interim dividend on 25 July 2007<sup>1323</sup>. It failed when it ran out of money on 13 September 2007, making the timing for a significant reduction in its capital seem unfortunate.

### **11.5 The Basel Committee’s May 2012 Proposals**

- 11.5.1 The next sections describe the choices ultimately made by the Basel Committee in designing the new models-based standard.
- 11.5.2 We pass over the criticisms made by the Basel Committee of the adequacy of the Basel 2.5 changes. These were always intended as a stop-gap, necessary to address some lessons of the crisis, but never as a comprehensive new framework. The Committee sets out five key elements to the proposed new framework:

- (a) a reassessment of the boundary between the trading book and the banking book. The Committee rejected abolishing the boundary, whilst insisting on improvements;
- (b) a new metric to replace VaR by expected shortfall (ES);
- (c) factoring in market liquidity;
- (d) the treatment of hedging and diversification risk; and
- (e) a revised relationship between the standardised and models-based approaches.

11.5.3 All of these principles are reflected in the final 2019 Basel III standard. It may be questioned why, given the introduction of a new metric based on expected shortfall, we have devoted so much space to VaR in the pages above. There are four reasons for this.

- (a) Firstly, ES is essentially an adjusted, albeit less flexible in some respects, measure than VaR. In other words, in most cases, if you can calculate the VaR then systems can be adapted to generate the ES for the portfolio concerned. Understanding VaR is therefore necessary to understand ES.
- (b) Secondly, a number of the criticisms directed against VaR apply in a similar way to ES. This is particularly the case when it comes to data limitations when calculating holding periods (now renamed liquidity horizons). By definition, in seeking to look into the tail beyond a 99% confidence level you will need more relevant data. The problems with data limitations described above in respect to VaR apply *a fortiori* to ES, as there will be smaller relevant data sets than for VaR. Essentially, Basel III adopts the square root of time followed by the original VaR standard to determine longer liquidity horizons than 10 trading days in calculating ES. Problems with the VaR measure due to limited data are therefore likely to be exacerbated with the move to ES.
- (c) Thirdly, for some portfolios ES cannot be calculated, in which case VaR may be the only risk management tool available to banks that do not want internally to rely on the new standardised approach. If an ES measure is unavailable, or the bank wishes to manage risk for purposes other than regulatory capital (and there are many reasons why regulatory requirements are not the sole determinant of internal risk management) then banks may still continue to rely on VaR (say for daily risk management based on the previous day's trading in setting the trading strategy for the next day, even if the results reported to regulators differ). ES may be a better measurement *for regulatory purposes* but there may be other reasons for using a different risk measurement for day-to-day decisions, particularly if that is already embedded in internal systems and reliable data sets to calculate it exist. Of course, there is a cost in operating internal risk management models different from regulatory reporting, but few sophisticated institutions totally outsource risk management to regulators, or third party vendors of data, or would consider it prudent to do so, as regulatory requirements may be over simplified.

(d) Finally, although ES is now the *regulatory* measure for capital held against market risk, Basel III still relies in important ways on VaR. Firstly, the default capital charge (DRC) is based on VaR, to ensure consistency with the credit risk framework. Further, the model validation and integrity standards that must be met for a bank to use an ES model are themselves based on VaR. Implicitly, despite the criticisms referred to above, the Basel Committee continues to view VaR as either a useful or even an essential measurement of risk for some purposes.

11.5.4 We will not describe in detail the proposed 2012 revised models-based approach as it was subject to substantial revision in 2013. However, we note the Committee's "objective for the models-based approach to calculating regulatory capital for the trading book is to estimate the amount of capital required to cover a potential loss in a period of stress from all sources of risk"<sup>1324</sup>.

11.5.5 There are three steps to the new framework that are retained by the final standard.

(a) The first step of the new framework is to determine eligibility for the models-based approach. This involves a focus on an overall assessment of a bank's internal model. If the bank fails this step, then it is required to use the standardised approach for all its trading book exposures.

(b) The next step is to break down the model approval process. Under the Market Risk Amendment, this was an all or nothing approach: if a model was approved then it applied across all trading activities in all instruments. Now, the Basel Committee's assessment of model approval applies at the level of a "trading desk" (not an individual trader) level. What this means is considered below when we come to consider the detailed new rules. This means that a bank could have approval for some but not all of its trading desks, depending on meeting the required criteria. Also, if a trading desk or desks cease to meet the criteria then model approval will be withdrawn, without forcing the bank to revert to the standardised approach for all market risk positions.

(c) The third step is to assess, on a trading desk-by-trading desk, which risk factors those desks are eligible to model, based essentially on the quality of data and how rapidly they can be updated. Those risk factors capable of modelling are capitalised using an expected shortfall approach. Factors deemed non-modellable, or not included in a particular trading desk's risk model, are capitalised in accordance with supervisory requirements specified by the Basel Committee.

11.5.6 The capital charge for eligible trading desks is the aggregated ES model requirement for modellable risk factors, plus the sum of the capital charge for non-modellable factors, with an additional capital charge for default and other risks. The aggregate capital charge for market risk consists of the capital charge (computed as above) for eligible trading desks, plus the standardised capital charge for all non-eligible trading desks.

## 11.6 The Second Consultative Document

- 11.6.1 The second consultative document is much broader in scope than the first, makes numerous changes in detail and also proposes a revised text. Only those aspects that remain relevant to the new market risk framework will be described. Although most of the main elements of the models-based approach are described in detail in the second consultative document, further refinements were made in the third consultative document (December 2014), the Market Risk Standard (January 2016), the fourth consultative document (March 2018) and the final market risk standard (February 2019)<sup>1325</sup>. This clearly reflects prolonged engagement with the banking community.
- 11.6.2 The second consultative document has five sections of which only the first two will be considered here: overall revisions to the market risk framework and the revised models-based approach. Proposals relevant to the standardised approach are considered under that heading in this chapter.
- 11.6.3 The first part of the consultative document (overall revisions) sets out proposals in six areas: (1) the boundary between the trading book and the banking book; (2) the treatment of credit risk; (3) factoring in market liquidity; (4) the new chosen risk metric (ES) and the treatment of stress; (5) the treatment of hedging and diversification; and (6) the relationship between the models-based approach and the standardised approach.

### *The boundary between the trading and banking book*

- 11.6.4 This “has been a source of weakness in the current regime. A key element of the existing boundary has been between banks’ effectively self-determined intent to trade, an inherently subjective criterion that has proved difficult to police and insufficiently restrictive from a prudential perspective”<sup>1326</sup>. The Committee designated as relevant criteria:
- (a) objectivity in the definition of the boundary;
  - (b) mitigation of opportunities for capital arbitrage;
  - (c) making the boundary less permeable;
  - (d) alignment with banks’ risk management processes; and
  - (e) ease of application.
- 11.6.5 The 2012 consultation advanced two alternatives: a trading evidence-based approach and a valuation-based approach. Both were rejected in 2013 in favour of a revised boundary based on how positions are risk managed, as well as to prevent banks from obtaining capital benefits from re-allocating positions between the trading and banking book. The Committee also endorsed a set of “presumptions” as to how particular positions should be allocated: “[g]enerally, instruments presumed to be in the trading book are so designated because they are held with the intention of short-term price movements or arbitrage profits; and/or to hedge risks resulting from such instrument types. ... These objective requirements and presumptions should facilitate the development of a common understanding amongst supervisors

on the types of instrument that would typically be included in the different books”<sup>1327</sup>. However, “[t]he Committee has not pursued specific quantitative thresholds for determining whether certain instruments would be allowed in the trading book. For example, the draft Accord does not include a regulatory definition of ‘stale positions’. This decision has been taken on the grounds that it is difficult to determine universal quantitative criteria, applicable across different instruments, portfolios, banks and jurisdictions”<sup>1328</sup>.

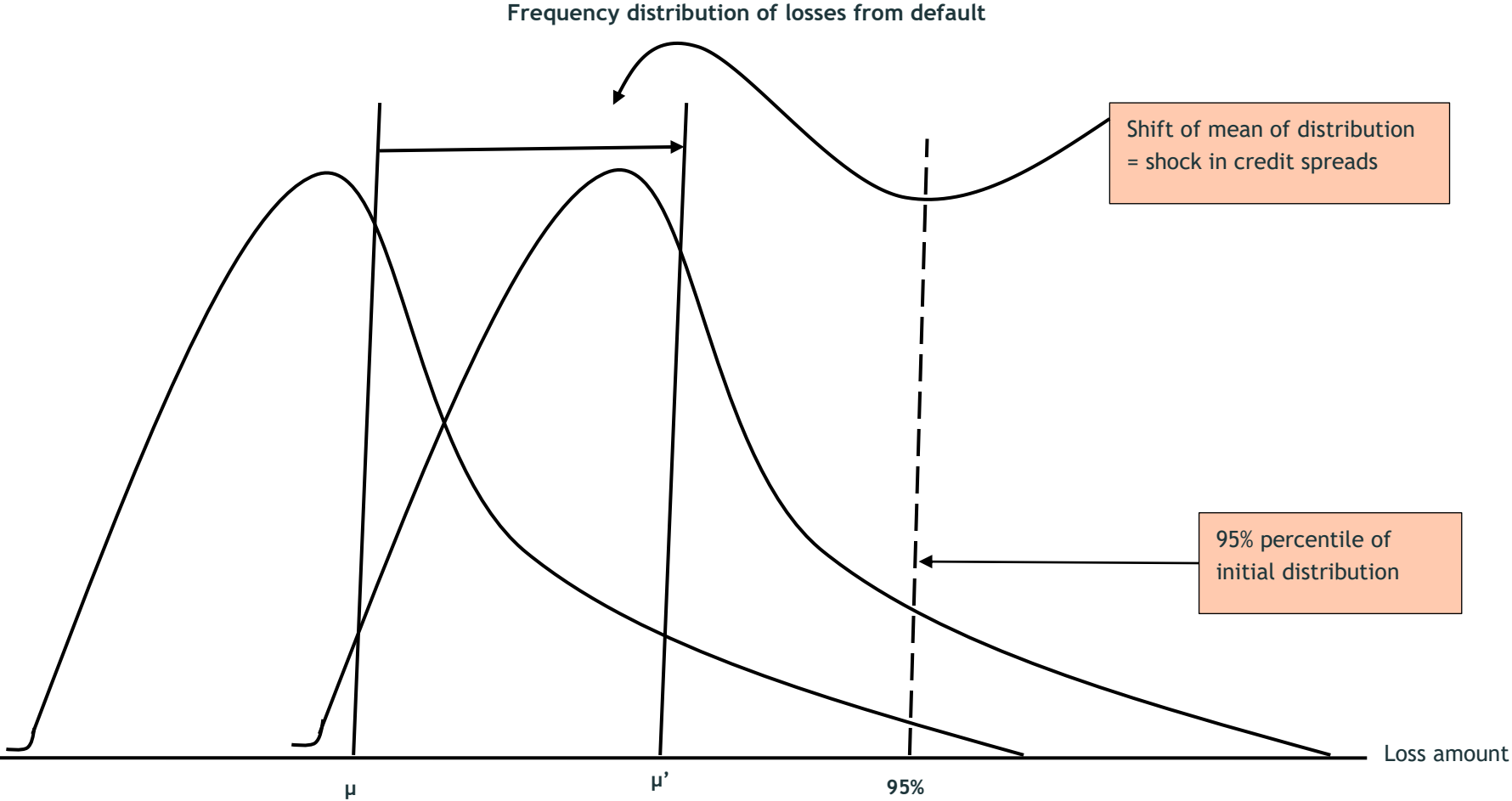
- 11.6.6 Regulatory arbitrage is addressed by “strict constraints on switching instruments between books. After initial designation of an instrument to either the trading or banking book, a bank may not re-designate the instrument to the other book, except in extraordinary circumstances. ... Where an instrument is switched to another book, the bank will not be allowed to benefit from a lower regulatory capital requirement from this switch. Supervisors are also explicitly given the authority to require a bank to re-designate a given instrument”<sup>1329</sup>. The “second measure to mitigate the risk of regulatory arbitrage is an effort to better align the trading book and banking book charges”<sup>1330</sup>.

#### *Addressing default and credit risk migration*

- 11.6.7 The document states that “[c]redit-related instruments were a key source of losses during the crisis and the regulatory treatment of these positions proved particularly flawed”<sup>1331</sup>. Following the responses to the 2012 consultative document the Committee decided that “the total capital charge for credit risk will have two separate components; an integrated credit spread risk capital charge, which will also cover migration risk, and an Incremental Default Risk (IDR) capital charge”<sup>1332</sup>.
- 11.6.8 The “objective of the capital requirement for credit spread is to capture the risk of changes in the market value of credit instruments with respect to the volatility of credit spreads”, whereas “[t]he objective of the capital requirement for default risk is to capture the incremental loss from defaults in excess of the mark-to-market (MtM) loss from changes in credit spreads and migration. The capital charge for MtM loss captures the risk of changes in credit spreads. It does not capture the risk of loss from jump to default”<sup>1333</sup>.
- 11.6.9 According to the Committee, “[c]redit spreads capture the expected loss from default (i.e. PD multiplied by LGD) and are a measure of the mean of the distribution of default losses (see chart). A change in credit spreads represents a shift in the mean of the mean of the default distribution. Therefore, the risk of an MtM loss from MtM risk is a capital charge for the volatility of the mean of the default distribution changes. The ES measure of MtM risk is a capital charge for the mean of the default distribution. This measure does not capture the risk of a jump to default (a jump in the mean of the default distribution to 100%). Thus, banks must hold an incremental amount of capital against default risk. The capital requirement for default risk is an IDR charge to capture the risk that the severity of defaults over the capital horizon will fall in the extreme tail of the default distribution. To avoid double counting, the capital charge for default risk should be quantified in terms of incremental default loss relative to mark-to-market losses already recognised in market values”<sup>1334</sup>. The proposed incremental capital charge is



based on a VaR calculation over a one year horizon calibrated to a 99.9% confidence level, which is the same as that applied to the banking book<sup>1335</sup>.



- 11.6.10 Given variations in banks' existing default and migration models, the Committee decided to require a more prescriptive treatment based on a two-factor default simulation model. Default correlations must be based on listed equity prices estimated over a one-year time horizon (using stressed figures)<sup>1336</sup>.
- 11.6.11 Basel 2.5 introduced a capital charge to capture the risk of changes in credit valuation adjustment (CVA). This requires banks to capitalise the impact of changes in their counterparties' credit spreads on all OTC derivatives after taking account of permitted hedges. A standardised and an advanced CVA approach are available. Basel III modifies this stand-alone capital charge within the market risk framework, although the models-based approach is based on the ES model used to capture bond credit spreads<sup>1337</sup>. It is described in chapter 12.

#### *Changes to the liquidity horizon*

- 11.6.12 The liquidity horizon (referred to as the holding period under Basel II) was 10 trading days. This reflected a judgment that banks would be able either to trade out, or effectively hedge, any position held within the trading book within two weeks. However, the evaporation of market liquidity during the acute stage of the financial crisis meant that banks were often unable to do so. "This violated a key assumption that was implicit in the 10-day VaR treatment of market risk. Moreover, large swings in liquidity premia, defined as the additional compensation required by investors to hold illiquid instruments led to substantial mark-to-market losses on fair-valued instruments as liquidity conditions deteriorated"<sup>1338</sup>. Unsurprisingly, the Committee made changes to the Basel II treatment. The proposal is to introduce varying liquidity horizons to take account of the fact that banks may be unable to hedge or exit positions without triggering material market price changes. The following changes apply:
- (a) the liquidity horizon is defined as "the time required to execute transactions that extinguish an exposure to a risk factor without moving the price of the hedging instruments, in stressed market conditions"<sup>1339</sup>;
  - (b) risk factors are assigned to five generic categories ranging from 10 to 120 trading days<sup>1340</sup>;
  - (c) liquidity horizons are set based on supervisory estimates and not left to banks' own internal modelling. This is "in recognition of the fact that market liquidity is a systemic concept: while individual banks might judge that they can all promptly exit or hedge their risk exposures without affecting market prices, the market is likely to turn rapidly illiquid in times of banking system stress if the banking system as a whole holds similar exposures"<sup>1341</sup>;
  - (d) risk factors are grouped into separate categories. "[S]upervisors will be able to require additional capital against exposures to particularly illiquid risk factors within a broad category"<sup>1342</sup>. Firms must map their exposures to the relevant category. For each of the five broad risk categories there is an "other" category "to capture all risk factors under any of the other

buckets”, which is “likely to be a relatively heterogeneous category”<sup>1343</sup>; and

- (e) in calculating ES a key practical consideration is how to apply risk factor shocks over longer and varying time horizons i.e. to extrapolate a longer-term holding period from data that are available only for a shorter period and still produce results that are meaningful.

11.6.13 Further revisions of a highly technical nature were made to the calculation of ES in the December 2014 third consultative document. The main change was to adopt a revised ES calculation for a base horizon for all risk factors, which would be scaled up to the longer specified risk horizon, using the square root of time, the limitations of which have been discussed above.

#### *Expected shortfall*

11.6.14 Expected shortfall was outlined above and is the basis of Basel III’s models-based market risk framework, and has enjoyed academic support as being superior to VaR, although it is based essentially on the same risk models as VaR. Kevin Dowd, in the second edition of *Measuring Market Risk*<sup>1344</sup>, writes that “the ES easily dominates the VaR as a risk measure”. His reasons are essentially as follows:

- (a) ES tells us what to expect in bad states;
- (b) an ES-based risk-expected return decision rule is valid under more general conditions than VaR-based risk-expected return decision rule;
- (c) ES satisfies “sub-additivity” while VaR does not (this has been considered above); and
- (d) the ES portfolio risk surface is convex, meaning that portfolio-optimising problems have a unique well-behaved optimum<sup>1345</sup>.

11.6.15 However, Dowd concludes that “ES is also rarely the ‘best’ coherent risk principle”<sup>1346</sup>, essentially as ES risk weights “imply that the user is risk-*neutral* between tail outcomes. Since we usually assume that agents are risk-*averse*, this would suggest that the ES is not, in general, a good risk measure to use, notwithstanding its coherence. If a user is risk-averse, it should have a weighting function that give *higher* losses a *higher* weight”<sup>1347</sup>. He advocates spectral risk measures based on risk aversion<sup>1348</sup>. As such measures are necessarily subjective, based on the “user’s risk aversion function”<sup>1349</sup>, it is hard to see how such metrics could ever form part of a regulatory standard, as allowing banks to determine their own risk-appetite when setting capital requirements creates inescapable problems of self-selection and moral hazard.

11.6.16 Further possible problems with ES identified by Auer<sup>1350</sup> include:

- (a) ES might effectively capture an incomplete or distorted tail risk, possibly providing a false sense of risk coverage;

- (b) poor quality or missing data can arbitrarily distort ES calculations; the same is not so for VaR as individual outliers are likely to have a very small effect on VaR; and
  - (c) backtesting ES against actual outcomes is harder than VaR, and less transparent<sup>1351</sup>.
- 11.6.17 Auer concludes “while the ES is indeed smartly sub-additive, it is more pretentious in its assertions, resentful with respect to outliers, and more elusive to validate. In a bit more earnestness, the ES is a fine measure with no agenda of its own. We should probably just try not to infuse it with an expressiveness unsupported by the underlying data”<sup>1352</sup>. Only time will tell whether these are real, as opposed to theoretical, concerns.
- 11.6.18 The confidence level for the new ES metric is set at 97.5%, meaning that banks’ models must be 97.5% accurate for each given liquidity horizon. The Committee states that this will “provide a broadly similar level of risk capture as the existing 99<sup>th</sup> percentile VaR threshold, while providing a number of other benefits, including generally more stable model output and often less sensitivity to extreme outlier observations”<sup>1353</sup>. We cannot express any view on this given the change to the risk metric and other changes made, including to the liquidity horizon for different classes of instrument. The only thing that can be said for certain is that the capital charge will be quite different than under Basel II<sup>1354</sup>.
- 11.6.19 Basel III requires banks to use a stressed calibration. The Basel 2.5 reforms introduced a “stressed VaR” calculation to take into account the fact that VaR figures produce an inadequate measurement of risk in a time of financial stress owing to its pro-cyclicality. However, simply adding a stressed calculation to a market-based calculation is duplicative and, although likely to be conservative, is not really a sensible way to measure risk. Hence the stress element is directly integrated into the ES calculation, and there is no additional charge.
- 11.6.20 As it is not practicable to develop an ES model that captures the full set of current risk factors for other than a relatively short period of time, the Committee originally decided that the data set must go back to 2005 (2007 in the final standard) based on a reduced set of risk factors relevant to individual banks’ portfolios and for which there is a sufficiently long history of data. However, banks are not given total freedom to determine the set of reduced risk factors for the stressed figure, and the chosen factors, in addition to meeting specified requirements must explain at least 75% of the variation of the full ES model.
- 11.6.21 The ES calculated using this reduced set of risk factors is then calibrated to the most severe 12 month period of stress since 2007 (or earlier, if a bank can calculate this). The stressed period is calculated based on the bank’s aggregate portfolio and not on specific risk factors. For most banks, this is likely to be 2007 or 2008 at the time of writing<sup>1355</sup>. This value is then scaled up by the ratio of the current expected shortfall using the full set of risk factors divided by the current expected shortfall using the reduced set of risk factors.

### *Hedging and diversification*

- 11.6.22 Under Basel II banks were permitted to internally model correlations within market risk measures (VaR, stressed VaR, IRC, etc.) and then add up the relevant capital charges. The Committee observed that as trading book portfolios contain a mix of long and short positions, the correlation assumptions (and implicitly, therefore, the capital treatment for hedging and diversification benefits) can materially affect the capital charge. Further, higher correlations may, depending on the composition of the portfolio, result in lower capital charges, which the Committee does not consider to be a conservative treatment. Hence it was decided that “the capital framework should only recognise hedges if they are likely to prove effective - and can be maintained - during periods of market stress”<sup>1356</sup>.
- 11.6.23 With this lengthy introduction we now proceed to set out, at a more granular level, the Basel III standard for market risk.

## **11.7 Basel III - The Definition of the Trading Book**

- 11.7.1 Unlike earlier iterations of the Basel Accord, there is no single definition of the trading book<sup>1357</sup>. Rather, instruments that meet the criteria set out in the following paragraphs are allocated to the trading book or to the banking book. Any residual positions are allocated to the banking book<sup>1358</sup>. Perhaps surprisingly, the rules are not set out in the modular section of the consolidated Basel framework on market risk (MAR) but in that on risk-based capital (RBC).
- 11.7.2 Instruments are defined as “financial instruments, foreign exchange (FX) and commodities. A financial instrument is any contract that gives rise to both a financial asset of one entity and a financial liability or equity instrument of another entity. Financial instruments include primary financial instruments (or cash instruments) and derivative financial instruments. A financial asset is any asset that is cash, the right to receive cash, the right to receive another financial asset or a commodity, or an equity instrument. A financial liability is the contractual obligation to deliver cash or another financial asset or a commodity. Commodities also include non-tangible (ie non-physical) goods such as electric power”<sup>1359</sup>.
- 11.7.3 Logically crypto-currencies or crypto-assets should be treated as a commodity if they are not intangible assets, money or a financial instrument. Some US courts and regulatory agencies have classified such digital assets as either a commodity or a security under federal law. However, the approach of the Basel Committee is to regard them as outside the current scope of the Basel framework, although in June 2021 the Committee published a consultative document on the prudential treatment of crypto-asset exposures. A second consultative document was published in June 2022. As no final standard has yet been released, this will not be considered further in this publication, although the intention is to incorporate the final standard into the consolidated Basel III text.
- 11.7.4 Instruments, FX and commodities can only be included in the trading book if there is no legal impediment to selling or fully hedging them<sup>1360</sup>. Trading book

instruments must also be fairly valued on a daily basis with valuation changes recorded in the profit and loss (P&L) account.

- 11.7.5 Any instrument that a bank holds for one or more of the following purposes must be allocated to the trading book unless Basel III requires it to be allocated to the banking book:
- (a) short-term resale;
  - (b) profiting from short-term price movements;
  - (c) locking in arbitrage profits; or
  - (d) hedging risks arising from any instrument falling within the three previous points<sup>1361</sup>.
- 11.7.6 All of the following instruments are deemed to be held for one of the above purposes (and therefore allocated to the trading book) unless required to be allocated to the banking book:
- (a) instruments in the correlation trading portfolio;
  - (b) instruments that would give rise to a net short credit or equity position in the banking book (i.e. if the present value of the banking book increases when an equity price decreases, or when a credit spread on an issuer or group of issuers of debt increases); and
  - (c) instruments resulting from underwriting commitments, in relation to securities, where the bank expects to purchase those securities on the settlement date<sup>1362</sup>.
- 11.7.7 There is a general (but rebuttable) presumption that the following instruments are trading book instruments (unless explicitly required to be allocated to the banking book; see below):
- (a) instruments held as accounting trading assets or liabilities;
  - (b) instruments resulting from market-making activities;
  - (c) equity investments in funds;
  - (d) listed equities<sup>1363</sup>;
  - (e) trading-related repo-style transactions; and
  - (f) options, including embedded derivatives, from instruments issued out of the bank's own banking book which relate to credit or equity risk<sup>1364</sup>.
- 11.7.8 The following instruments are, in all cases, allocated to the banking book:
- (a) unlisted equities;
  - (b) instruments designed for securitisation warehousing;

- (c) real estate holdings and derivatives on real estate holdings;
  - (d) retail and SME credit;
  - (e) equity investments in a fund unless at least one of the following two following criteria are met: (1) the bank can “look through” the fund to its component parts and there is sufficient and frequent information, verified by an independent third party, proving the fund’s composition; or (2) the bank obtains daily price quotes for the fund and has access to the fund’s mandate;
  - (f) hedge funds;
  - (g) derivatives and funds that have the same instrument types as underlyings listed above; and
  - (h) instruments held for the purpose of hedging a particular risk of a position in the types of instruments listed above<sup>1365</sup>.
- 11.7.9 Any other instruments not referred to in the preceding paragraphs are allocated to the banking book<sup>1366</sup>.
- 11.7.10 Basically, the scheme is as follows:
- (a) some instruments must be allocated to the trading book (unless required to be allocated to the banking book in which case the banking book treatment prevails);
  - (b) some instruments must in all cases be allocated to the banking book;
  - (c) some instruments are *presumed* to fall within the trading book, but this presumption may be rebutted; and
  - (d) any residual class of instruments falls within the banking book.
- 11.7.11 Compared with the original definition based on subjective trading intent the purpose of these rules is to restrict banks’ ability to select which instruments are held in the trading book and which in the banking book. However, the Committee accepts that some instruments (e.g. repos) may be entered into, or used to hedge exposures, in either book. Hence the “general presumption” referred to above. Further, repo-style transactions entered into for liquidity management and valued at accrual are not presumed to be trading book transactions<sup>1367</sup> for obvious reasons.
- 11.7.12 For the presumptive list, banks may choose to classify a position in the banking book only if it receives approval for a banking book treatment on the basis that it is not held with trading intent (e.g. a 5 year repo intended to be held to maturity)<sup>1368</sup>. If approval is denied the bank must include the instrument in the trading book<sup>1369</sup>.



### *Supervisory powers*

11.7.13 National supervisors can require banks to provide evidence that an instrument on the presumptive list is actually held for trading purposes. If the supervisor considers the instrument would customarily belong in the banking book it may require the bank to reassign it unless it must be held in the trading book<sup>1370</sup>. The same applies to instruments held in the banking book that the national supervisor considers customarily to belong to the trading book<sup>1371</sup>.

### *Restrictions on transfers between the trading and banking books*

11.7.14 Basel III introduces strict restrictions on moving instruments between the trading and banking books. This is to prevent regulatory arbitrage. During the financial crisis certain institutions moved positions previously held in the trading book to the banking book to avoid the need to report mark-to-market losses where trading was taking place at distressed levels in thin markets on the basis the bank no longer intended to trade the instruments. It may be questioned whether this is properly attributed to actual regulatory arbitrage as opposed to the inappropriate use of fair value accounting in a crisis. However, the Basel Committee's decision to address *possible* regulatory arbitrage is understandable.

11.7.15 Basel III states that “[s]witching instruments for regulatory arbitrage is strictly prohibited. In practice, switching should be rare and will be allowed by supervisors only in extraordinary circumstances. Examples are a major publicly announced event, such as a bank restructuring that results in the permanent closure of trading desks, requiring termination of the business activity applicable to the instrument or portfolio or a change in accounting standards that allows an item to be fair-valued through P&L. Market events, changes in the liquidity of a financial instrument, or a change of trading intent alone are not valid reasons for reassigning an instrument to a different book”<sup>1372</sup>.

11.7.16 Moreover, “[w]ithout exception, a capital benefit as a result of switching will not be allowed in any case or circumstance. This means that the bank must determine its total capital requirement (across the banking book and trading book) before and immediately after the switch. If this capital requirement is reduced as a result of this switch, the difference as measured at the time of the switch will be imposed on the bank as a disclosed Pillar 1 capital surcharge. This surcharge will be allowed to run off as the positions mature or expire, in a manner agreed with the national supervisor. To maintain operational simplicity, it is not envisaged that this additional capital requirement would be recalculated on an ongoing basis, although the positions would continue to be subject to the ongoing capital requirements of the book into which they have been switched”<sup>1373</sup>.

11.7.17 It follows that *if* a national supervisor permits a switch, then there *could* be a capital benefit if the switch results in lower on-going capital requirements than would have been the case had the switch not occurred. This would seem most likely to be the case where the switch is to the banking book and the instrument is held at value on transfer in circumstances where the application of fair value accounting would have resulted in further losses, but there is no

impairment of the asset when held in the banking book. Such cases are intended to be very rare in practice.

11.7.18 Given the general restriction on switching we do not discuss further the specific rules on transfers between the two regulatory books.

11.7.19 In terms of internal risk transfers (i.e. without switching), there is no regulatory capital recognition of internal risk transfers from the trading book to the banking book<sup>1374</sup>. Specific rules apply to internal risk transfers to the trading book from the banking book<sup>1375</sup>. Further discussion is outside the scope of this publication. Internal risk transfers between trading desks within the trading book generally receive regulatory recognition<sup>1376</sup>. Specific rules apply to internal risk transfers in respect of the credit risk valuation (CVA) capital requirement<sup>1377</sup>.

## 11.8 Basel III - The New Market Risk Framework for Banks Using Internal Models

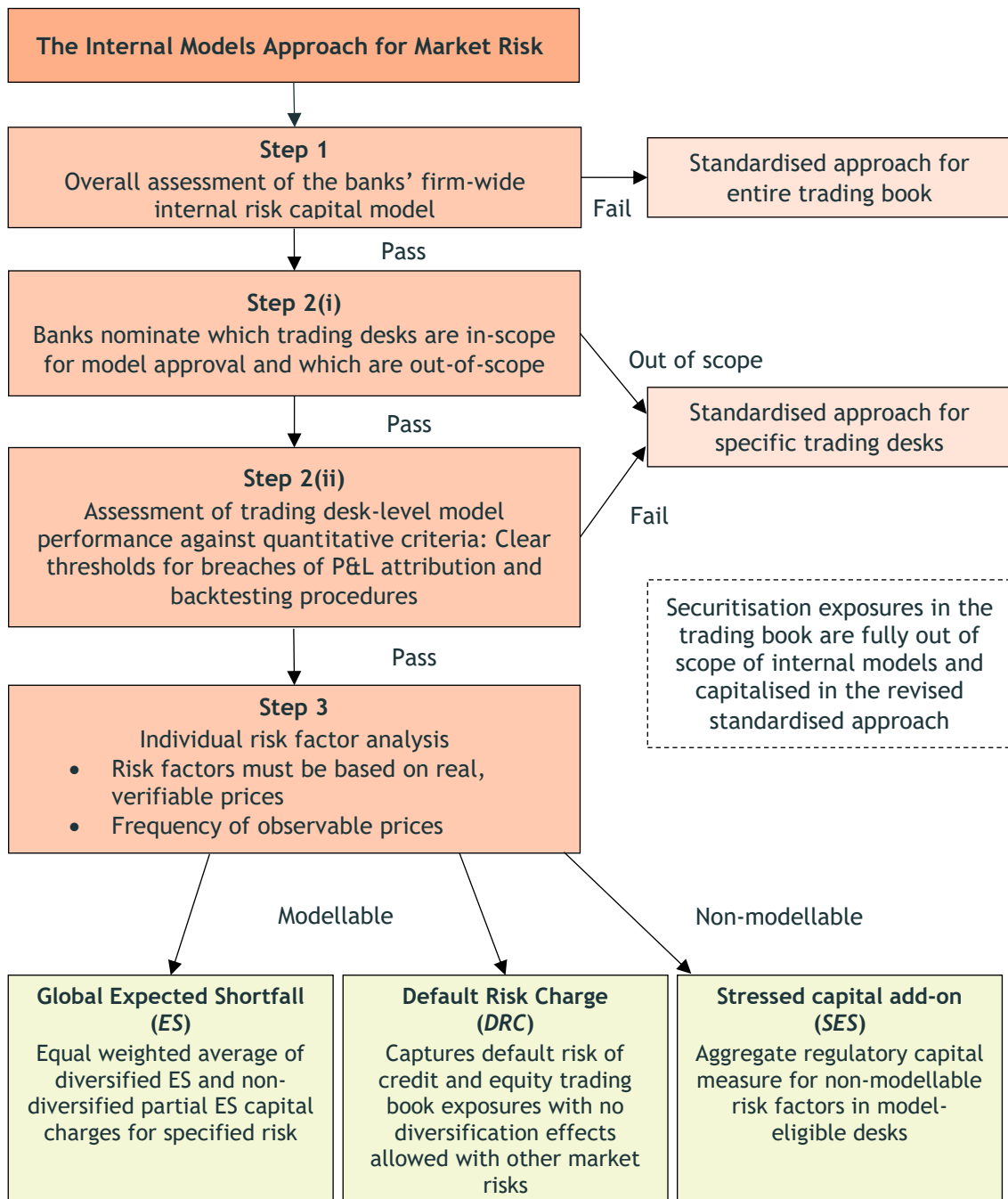
11.8.1 We now consider first the minimum requirements - both quantitative and qualitative - that apply under the internal models-based approach, before providing a description of the capital charges and how they are determined.

11.8.2 Market risk is defined as “the risk of losses in on- and off-balance sheet risk positions arising from movements in market prices”<sup>1378</sup>.

11.8.3 A bank requires the consent of its supervisor to apply an internal models approach<sup>1379</sup>. Any significant changes to the model must also be approved in advance<sup>1380</sup>. Approval will only be granted if (*inter alia*):

- (a) the bank’s risk management system is conceptually sound and implemented with integrity;
- (b) the bank has sufficiently skilled staff in the use of models, including trading and risk management; and
- (c) the bank’s model has a proven track record of reasonable accuracy in measuring risk<sup>1381</sup>.

11.8.4 A four stage approach applies to the models-approval process. Firstly, the bank must show that its internal risk management model meets the requirements set out in MAR. Secondly, the bank must nominate trading desks for supervisory approval for use of the internal models approach. Thirdly, the supervisor determines whether the nominated trading desks individually meet the requirements. Finally, the bank must meet the profit and loss application tests, as well as the backtesting requirements on an on-going basis<sup>1382</sup>. This is illustrated in the diagram below:



*The definition of trading desks*

11.8.5 It has been explained that Basel III requires model approval on a trading desk-by-trading desk basis. We now proceed to describe the relevant requirements for a “trading desk”. This is “a group of traders or trading accounts that implements a well-defined business strategy operating within a clear risk management structure”<sup>1383</sup>. It is therefore not simply an individual trader acting on his or her own.

- 11.8.6 Banks can always define their trading desks, but the choice of desks is subject to supervisory approval if the bank wishes to use an internal ES model to calculate the capital requirements for that trading desk<sup>1384</sup>. Banks may also designate sub-desks for internal risk management purposes, but these cannot be used to calculate regulatory capital<sup>1385</sup>. Basel III sets out three “key attributes” of a trading desk. These are as follows:
- (a) A trading desk is an unambiguously defined group of traders or trading accounts. The following specifications apply:
    - (i) a trading account is an indisputable and unambiguous unit of observation in accounting for trading strategy;
    - (ii) the trading desk must have one head trader, but can have two provided either one has authority over the other, or their respective roles and responsibilities are clearly separated;
    - (iii) each trading account must be assigned to a single trading desk;
    - (iv) there is a presumption that traders (and head traders) are assigned to only one trading desk, although an individual trader may work across several trading desks with supervisory approval, if it can be justified on sound management, business or resource allocation reasons; and
    - (v) the trading desk must have a clear reporting line to senior management, and a compensation policy linked to the objectives of the desk<sup>1386</sup>.
  - (b) A trading desk must have a well-defined and documented business strategy, including an annual budget and regular management reports. In particular:
    - (i) there must be a clear description of the economics of the business strategy for the trading desk, its primary activities and trading strategies;
    - (ii) the management team at the trading desk must have a clear annual plan for budgeting and staffing of the trading desk; and
    - (iii) a trading desk’s documented business strategy must include regular management information reports<sup>1387</sup>.
  - (c) A trading desk must have a clear risk management strategy. This encompasses the following:
    - (i) the bank must identify key groups and personnel responsible for overseeing risk-taking activities at the trading desk;
    - (ii) the trading desk must have clearly defined trading limits based on the desk’s business strategy. These must be reviewed at least annually by senior management;

- (iii) a trading desk must produce, at least weekly, appropriate risk management reports, including profit and loss reports, and risk-measurement reports that include both desk VaR and ES measures<sup>1388</sup>.
- 11.8.7 Banks must prepare and make available to supervisors on request the following for all trading desks:
  - (a) inventory aging reports;
  - (b) daily limit reports, including exposures, limit breaches and follow-up action;
  - (c) reports on intra-day limits and utilisation for banks with active intra-day trading; and
  - (d) reports on the assessment of market liquidity<sup>1389</sup>.
- 11.8.8 As foreign exchange and commodity positions held in the banking book are required to be treated under the market risk framework (there is no bespoke banking book treatment), such positions are treated as held on purely notional trading desks within the trading book<sup>1390</sup>.

*Requirement for a bank to use the models-based approach*

- 11.8.9 At least 10% of a bank's capital charge for market risk must be calculated in accordance with the internal models approach for such an approach to be allowed. This is calculated on a quarterly basis<sup>1391</sup>. Securitisation positions are not eligible for the internal models-based approach<sup>1392</sup>. Accordingly, the standardised approach must be used.

*Requirement to calculate the standardised approach capital charge for banks using internal models*

- 11.8.10 All banks that have supervisory approval to use the internal models-based approach for one or more trading desks must:
  - (a) calculate the standardised approach capital charge across all trading desks, including those desks with model approval; and
  - (b) calculate on a stand-alone basis the standardised approach capital charge for each trading desk with model approval (with no netting allowed between trading desks)<sup>1393</sup>.
- 11.8.11 According to the Basel Committee, these calculations will:
  - (a) serve as an indication of the fall-back capital requirement for trading desks that fail the eligibility criteria (e.g. because of backtesting results);
  - (b) generate information on the capital outcomes of internal models both across banks and relative to the standardised approach;
  - (c) enable monitoring over time of the relative calibration of standardised and model-based approaches; and

- (d) provide macro-prudential insight<sup>1394</sup>.

#### *Qualitative standards*

11.8.12 The following requirements apply:

- (a) the bank must have an independent risk control unit responsible for the design and implementation of the market risk system, which must produce and analyse daily reports;
- (b) the risk unit must carry out the profit and loss attribution and backtesting tests (see below);
- (c) a separate unit at the bank must conduct initial and on-going validation of all internal models on at least an annual basis;
- (d) the board of directors and senior management must be actively involved in the risk control process, and devote appropriate resources to risk control. The daily reports must be reviewed by a level of management with sufficient seniority and authority to enforce reductions in positions;
- (e) the “core design elements” of the bank’s regulatory approved model and any internal models used by the bank in day-to-day internal risk management must be the same;
- (f) stress testing results must be reviewed at least monthly by senior management, used in the bank’s internal assessment of capital adequacy and be reflected in the policies and limits set by senior management and the board of directors; and
- (g) various documentation requirements must be fulfilled<sup>1395</sup>.

11.8.13 The bank’s internal models must cover the full set of positions within the scope of the model<sup>1396</sup>, and on at least an annual basis be reviewed by internal or external audit<sup>1397</sup>.

11.8.14 Internal models must be conceptually sound and adequately reflect all risks, and must be revalidated periodically, particularly if there are significant changes to the market, or the composition of the bank’s portfolio, making the models no longer adequate. Specific standards apply<sup>1398</sup>.

11.8.15 Banks are required to have rigorous and comprehensive stress testing programmes at the trading desk, as well as at the bank-wide level<sup>1399</sup>. The stress tests must cover a range of factors that can create extraordinary losses, or make the control of risk in portfolios very difficult<sup>1400</sup>. Stress tests must have quantitative and qualitative aspects, including plausible stress scenarios, and the capacity of the bank to absorb potentially serious losses<sup>1401</sup>. Stress testing results must be communicated routinely to senior management and periodically to the board<sup>1402</sup>.

*Model requirements*

11.8.16 The basic concept used by Basel III is that of “risk factors”. Risk factors are “the market rates and prices that affect the value of the bank’s trading positions”<sup>1403</sup>. The risk factors must be sufficient to represent the risks inherent in the bank’s portfolio of on- and off-balance sheet items<sup>1404</sup>. The internal model must include all risk factors used for pricing, and any omissions from risk factors used for pricing, but not in the firm’s internal model, must be justified to the satisfaction of the relevant supervisor<sup>1405</sup>. The requirement to use all risk factors extends to all those factors specified under the standardised approach, except for securitisation exposures which are ineligible for the internal models approach, and are treated under the standardised approach<sup>1406</sup>.

*Risk factors*

11.8.17 The risk factors specified under the standardised approach are summarised in the section dealing with the standardised approach and are not repeated here. Instead we concentrate on types of risk that must be taken into account under an internal model.

11.8.18 Interest rate risk is the risk that a bank suffers losses as a result of a change in interest rates on its portfolio of bonds and interest rate derivatives. Interest rate risk is divided into two general sub-categories: general interest rate risk and specific interest rate risk. General interest rate risk arises as a result of a change in the general level of interest rates in a currency (e.g. the Bank of England base rate). Specific interest rate risk arises as a result of factors idiosyncratic to an issuer (e.g. an improvement or downgrading of the bank’s assessment of the creditworthiness of a counterparty).

11.8.19 The capital charge for general market risk applies to government debt, corporate bonds and derivatives that include interest rate risk.

11.8.20 For interest rate risk a bank must use a set of risk factors that corresponds to the interest rates associated with each currency in which the bank has on- or off-balance sheet exposures. The bank must model the yield curve, divided into segments along the curve. Banks are required to model at least six risk factors for material exposures in major currencies and markets<sup>1407</sup>. If a bank cannot model specific risk it is treated as unmodellable.

11.8.21 Equity risk is the risk that a bank may suffer losses as a result of movements in the market prices of equities, or their derivatives, held in the trading book. Banks are required to use risk factors that correspond to each of the equity markets in which the bank holds significant positions. These factors must reflect both market-wide movements in equity prices and may reflect movements in prices of individual equities to which the bank is exposed. The former is normally referred to as general equity market risk and the latter as specific risk. Banks may use risk factors that reference specific industry sectors (e.g. retail) as well as cyclical and non-cyclical factors. The sophistication and nature of the modelling technique should correspond to the bank’s exposure to the overall market, as well as the concentration on individual equities<sup>1408</sup>.

- 11.8.22 Equity investments in funds where look-through is possible are treated as exposures to each of the underlying exposures in the fund, and the bank must assign the positions to the trading desk to which the fund is assigned. Where look-through is not possible, but the bank has access to daily prices and the mandate of the fund, then the standardised approach applies<sup>1409</sup>. If not a capital requirement equivalent to a deduction from capital applies.
- 11.8.23 Exchange rate risk is the risk of a bank suffering losses from movements in exchange rates. Banks' models must incorporate risk factors that correspond to the individual foreign currencies in which a bank's positions are denominated. Foreign exchange risk arises on all exposures that are denominated in a currency other than the bank's reporting currency<sup>1410</sup>. FX risk in banking book exposures is required to be treated under the market risk framework.
- 11.8.24 Commodities risk is the risk of loss as a result of exposure to commodity price changes (as well as their derivatives). Banks must utilise risk factors corresponding to each of the commodity markets in which the bank holds significant positions. The required sophistication of banks' models depends on the scale of their commodities trading, with those with an active trading portfolio required to model for the convenience yield (e.g. the ability to profit from temporary market shortages where the bank owns the commodities in question) between forwards and cash positions<sup>1411</sup>.

*Modellable and non-modellable risk factors*

- 11.8.25 Having identified the relevant risk factors for each asset class in accordance with the above rules, banks must next determine whether the particular risk factor is modellable or not. The capital treatment differs depending on whether this is the case or not. This is a significant change from Basel II where all risk factors were considered modellable. Under Basel III a risk factor is only modellable if it satisfies the risk factor eligibility test (RFET). This test requires a sufficient number of real prices representative of the risk factor. At least one of the following must be satisfied for a price to be considered a real price:
- (a) it is a price at which a bank has conducted a transaction;
  - (b) it is a verifiable price from a transaction between arms' length third parties;
  - (c) it is a price derived from a committed quote made by the bank or another third party; or
  - (d) it is a price from a third party vendor satisfying specified criteria<sup>1412</sup>.
- 11.8.26 The intention is to restrict reliance on internal models to those risk factors for which the bank has sufficient actual prices, rather than relying on the output of a model.
- 11.8.27 Either of the two following criteria must be met on a quarterly basis for a risk factor to be considered as modellable:



- (a) the bank must identify at least 24 real price observations per year, with no more than one price observation per day, and there must be no 90 day period with fewer than four real price observations. These criteria must be monitored and met on a monthly basis; or
  - (b) the bank must identify for the relevant risk factor at least 100 real price observations over the past 12 months, with no more than one price observation per day<sup>1413</sup>.
- 11.8.28 Where real price data are obtained from a third party vendor, the vendor must provide specified information and be subject to audit on its pricing information<sup>1414</sup>.
- 11.8.29 If a risk factor is a point on a curve then in order to count real price observations banks may either use their own internal risk bucketing approach, or use a regulatory approach<sup>1415</sup>. In the former case each risk factor must be allocated to a bucket<sup>1416</sup>.
- 11.8.30 Once a risk factor has passed the RFET test (above) banks are required to ensure that the data used to calibrate their ES model satisfy specified principles. Supervisors may also decide on a case-by-case basis that data are unsuitable to calibrate the model and, if so, the risk factor is excluded from the ES model<sup>1417</sup>. The following principles apply:
- (a) the data used may include combinations of risk factors;
  - (b) the data used must allow the model to pick up both idiosyncratic and general market risk. General market risk is the tendency of an instrument's value to change with the change of the broader market, whereas idiosyncratic risk is the risk associated with a specific issuance (i.e. specific and general equity and interest rate risk, *supra*). If both are not captured by the bank's model then the uncaptured risk factor is treated as unmodellable (but the bank may model the other risk factor);
  - (c) the data must allow the model to reflect volatility and correlation of the risk positions;
  - (d) the data must be reflective of prices observed and/or quoted in the market, and if not derived from real price observations must be reasonably representative of such prices;
  - (e) data must be updated with sufficient frequency, preferably on a daily basis, but at a minimum on a monthly basis;
  - (f) the data used to determine the stressed ES calculation must be reflective of the prices observed and/or quoted during the chosen stress period. Any divergence from historical prices (for example, if the relevant instrument differs in its characteristics from that available for the relevant period) must be empirically justified; and
  - (g) the use of proxies for data must be limited, and the chosen proxies must have sufficiently similar characteristics to the transactions they represent<sup>1418</sup>.

*The capital adequacy calculation*

- 11.8.31 According to Basel III, “[b]anks will have flexibility in devising the precise nature of their expected shortfall (ES) models”, provided that the minimum standards are adhered to<sup>1419</sup>. ES must be calculated on a daily basis for bank-wide internal models used to calculate market risk capital requirements, as well on a daily basis for each trading desk using the internal model<sup>1420</sup>.
- 11.8.32 ES is calculated using a 97.5% one tailed confidence level<sup>1421</sup>. This means that for each 200 liquidity horizons (which, as has been seen, vary under Basel III) the model should fail to predict the actual loss no more than five times.
- 11.8.33 As seen above, a variable liquidity horizon replaces the 10 day holding period under Basel II. However, this is achieved by calculating a base liquidity horizon of 10 days and then scaling up this base result in accordance with a formula<sup>1422</sup>. Hull explains as follows the calculation:

“In FRTB [Basel III], banks are required to consider changes over a period of 10 days that occurred during a stressed period in the past. Econometricians naturally prefer that non-overlapping be used when VaR or ES is being estimated using historical simulation, because they want observations on the losses to be independent. However, this is not feasible when 10-day changes are considered, because it would require a very long historical period. The first simulation trial assumes that the percentage changes in all risk factors over the next 10 days will be the same as their change between Day 0 and Day 10 of the stressed period; the second simulation trial assumes that the percentage changes in all risk factors over the next 10 days will be the same as their changes between Day 1 and Day 11 of the stressed period; and so on.

Banks are first required to calculate ES when 10-day changes are made to all risk factors. (We will denote this by  $ES_1$ ). They are then required to calculate ES when 10-day changes are made to all risk factors in category 2 and above with risk factors in category 1 being kept constant. (We will denote this as  $ES_2$ ). They are then required to calculate ES when 10-day changes are made to all risk factors in categories 3, 4 and 5 with risk factors in categories 1 and 2 being kept constant. (We will denote this as  $ES_3$ ). They are then required to calculate ES when 10-day changes are made to all risk factors in categories 4 and 5 with risk factors in categories 1, 2 and 3 being kept constant. (We will denote this as  $ES_4$ ). Finally, they are required to calculate  $ES_5$ , which is the effect of making 10-day changes only to category 5 risk factors”<sup>1423</sup>.

- 11.8.34 The categories referred to above are the liquidity horizons of 10 days, 20 days, 40 days, 60 days and 120 days<sup>1424</sup>. According to Hull:

“[Basel III] represents a movement away from basing calculations on one-day changes. Presumably, the Basel Committee has decided that, in spite of the lack of independence of observations, a measure calculated from 10-day changes provides more relevant information than a measure calculated from one-day changes. This could be the case if changes on successive days are not independent, but changes in successive 10-day periods can reasonably be assumed to be independent”<sup>1425</sup>.

- 11.8.35 The author concludes:

“After 20 years of using VaR with a 10-day time horizon and 99% confidence to determine market risk capital, regulators are switching to ES with a 97.5% confidence level and varying time horizons. The time horizons, which can be as high as 120 days, are designed to incorporate liquidity considerations into the capital calculations. The change that is considered to a risk factor when capital is calculated reflects movements in the risk factor over a period of time equal to the liquidity horizon in stressed market conditions”<sup>1426</sup>.

- 11.8.36 The liquidity horizon for each type of risk factor is set out in the table below. Banks are required to map each of their chosen risk factors to the categories set out in the table, and satisfy specified documentation and validation requirements<sup>1427</sup>.

Liquidity horizon by risk factor	
Risk factor	Liquidity horizon in trading days
Interest rate (EUR, USD, GBP, AUD, JPY, CAD and the domestic currency of the bank)	10
Interest rate (other currencies)	20
Interest rate: volatility	60
Interest rate: other types of risk factors	60
Credit spreads: sovereign - investment grade	20
Credit spreads: sovereign - high-yield	40
Credit spread: corporate - investment grade	40
Credit spread: corporate - high-yield	60
Credit spread: volatility	120
Credit spread: other types of risk factor	120
Equity price: large cap	10
Equity: small cap	20
Equity: large cap-volatility	20
Equity: small cap-volatility	60
Equity: other types of risk factors	60
Foreign exchange: specified currency pairs	10
Foreign exchange: other pairs	20
Foreign exchange: volatility	40
Energy and carbon emissions prices	20

Liquidity horizon by risk factor	
Risk factor	Liquidity horizon in trading days
Precious and non-ferrous metals	20
Other commodities	60
Energy and carbon emissions prices: volatility	60
Precious and non-ferrous metals: volatility	60
Other commodities: volatility	120
Other commodities: other risk factors	120

- 11.8.37 The maximum liquidity horizon is 120 days, which is a little less than six months' of trading days.
- 11.8.38 For the actual ES figure banks are required to update their data sets at least every three months, and also reassess data sets when market prices are subject to frequent changes<sup>1428</sup> (e.g. during a crisis).
- 11.8.39 Where a bank hold options in its trading book then the ES model must accurately capture the risks associated with interest rate risk, equity risk, foreign exchange risk, commodity risk and credit risk. Further the non-linear price characteristics of options, as well as volatilities associated with option prices (vega risk), must be captured<sup>1429</sup>.
- 11.8.40 No specific *type* of model is prescribed, provided the minimum requirements are met. Permissible models therefore include historical simulation, Monte Carlo simulation, certain parametric approaches and other analytical techniques<sup>1430</sup>. However, some models that could be used to calculate VaR under Basel II would appear to be ruled out by the RFET requirement, or by the nature of ES as a market risk measure. (While VaR can always in theory be calculated, the same is not true of ES, as it takes into account losses *beyond* the specified confidence level).
- 11.8.41 Additionally, banks must calculate a stressed ES figure. This replicates the ES outcome that would be generated by the bank's current portfolio if the relevant risk factors were experiencing a stress. The calibration of this stressed ES is based on a reduced set of risk factors selected by the bank that are relevant for their current portfolio and for which there is a sufficiently long data set of observations. The reduced risk factors must be approved by the bank's supervisor, meet the requirements for a risk factor to be modellable, and the reduced set of risk factors chosen must explain at least 75% of the variation of the full ES model (i.e. all risk factors used to calculate the non-stressed ES figure)<sup>1431</sup>.
- 11.8.42 The stressed ES figure is based on the most severe 12 month period of stress available for the observation horizon of the bank<sup>1432</sup>. This is the period over which the bank experiences the greatest loss, spanning back to and including 2007<sup>1433</sup> (which is generally reckoned to be the start of the financial crisis). The stressed figure must be updated at least quarterly, or whenever there are

material changes in the risk factors in the portfolio. The reduced set of risk factors used to calculate the stressed ES must also be updated at the same time<sup>1434</sup>.

#### *Calculation of the capital requirement*

- 11.8.43 Those trading desks that are approved to use an internal models approach must calculate the ES using all risk factors that are deemed modellable. Under this calculation the bank may recognise any cross-risk class correlations. The bank must then calculate a series of partial ES capital requirements (holding all other risk factors constant) for the range of risk classes (interest rate risk, equity risk, foreign exchange risk, commodity risk and credit risk spread). These partial and constrained ES values are summed to provide an aggregate cross-risk class ES calculation<sup>1435</sup>.
- 11.8.44 The stressed ES is incorporated as follows. The calculation of the stressed ES has already been explained above. The stressed ES calculated on the reduced set of risk factors is scaled up by the ratio of (1) the current ES calculated using all of the risk factors to (2) the current ES measure using the reduced set of risk factors. This ratio is floored at one<sup>1436</sup> so the stressed ES figure sets a floor to the ES calculation.
- 11.8.45 The calculation may be set out as follows:

$$ES = ES_{R,C} \times \frac{ES_{F,C}}{ES_{R,C}}$$

Where:

$ES_{R,C}$  is the stressed ES figure calculated based on the restricted set of risk factors.

$ES_{F,C}$  is the most recent ES figure based on the most recent 12 month observation period with the full set of risk factors<sup>1437</sup>.

- 11.8.46 The aggregate capital requirement for modellable risk factors is calculated based on the weighted average of the constrained and unconstrained ES capital requirements, taking into consideration the stressed ES calculation referred to above<sup>1438</sup>.
- 11.8.47 The actual capital calculation for those trading desks with model approval and meet the various requirements summarised in the next section is equal to the maximum of the most recent observation and a weighted average of the previous 60 days scaled up by a multiplier<sup>1439</sup>. The multiplier is generally set at 1.5, although national supervisors may set a higher level in defined cases<sup>1440</sup> (e.g. deficiencies in the model that do not justify model approval being revoked).

#### *Capital requirement for non-modellable risk factors*

- 11.8.48 We have mentioned the existence of risk factors that cannot be modelled as they do not satisfy the RFET test. Capital requirements for non-modellable risk factors must be determined using a stress scenario that is calibrated to

be at least as prudent as the 97.5% ES calibration used for modellable risk factors. In selecting the stress scenario the bank must determine a common 12 month period of stress across all non-modellable risk factors in the same risk class. With supervisory approval the bank may calculate stress scenario capital requirements at the bucket level for risk factors that belong to curves. For each such non-modellable risk factor the bank is required to set a liquidity horizon that is the greater than that given for modellable risk factors in the table above and 20 days. Non-modellable risk factors arising from idiosyncratic (i.e. issuer) credit spread risk banks may be based on a common 12 month stress period. Banks that cannot satisfy their supervisor that their stress scenario is adequate have to use the maximum potential loss as the stress scenario i.e. a total loss<sup>1441</sup>.

#### *Capital requirement for market risk other than default risk*

- 11.8.49 This is simple. It is the aggregate capital requirement for all approved and eligible trading desks plus the capital charge for all trading desks calculated under the standardised approach for those trading desks without model approval, or which are ineligible to use their model<sup>1442</sup>. If any trading desk is in the “amber zone” (see below) then a capital surcharge applies<sup>1443</sup>.
- 11.8.50 The capital charge is then multiplied (as under the Basel II framework) by 12.5<sup>1444</sup> to integrate the final figure into the bank’s overall capital charge in a manner consistent with the risk-asset ratio for credit risk (12.5 multiplied by 8% equals 1).

#### *Backtesting*

- 11.8.51 In order for a bank to be permitted to use an internal market risk model it must also satisfy quantitative and qualitative requirements for backtesting and the profit and loss account attribution test (PLA). These will be briefly described below. Both are intended to ensure the integrity of the model as well as its accuracy over time.
- 11.8.52 Basel III defines “backtesting” as “the process of comparing daily actual and hypothetical profits and losses with model-generated VaR measures to assess the conservatism of risk measurement systems”<sup>1445</sup>.
- 11.8.53 Backtesting must be performed at both the bank-wide and trading desk level. The PLA test only applies at the trading desk level<sup>1446</sup>. Backtesting therefore relies on VaR methodology.
- 11.8.54 Backtesting commences on the date that a bank receives approval to use an internal model for one or more trading desks<sup>1447</sup>. The requirement is to compare the VaR measure over a one day holding period against each of: (1) the actual profit & loss (APL) and (2) the hypothetical profit and loss (HPL) over the past 12 months<sup>1448</sup>.
- 11.8.55 The APL is defined as “the actual P&L derived from the daily P&L process. It includes intraday trading as well as time effects and new and modified deals, but excludes fees and commissions as well as valuation adjustments for which separate regulatory capital approaches have been otherwise specified or which are deducted from Common Equity Tier 1. Any other valuation

adjustments that are market risk-related must be included in the APL<sup>1449</sup>. Foreign exchange and commodity risk in the banking book is included in the APL as there is no banking book treatment.

- 11.8.56 The HPL is defined as “the daily P&L produced by revaluing the positions held at the end of the previous trading day using the market data at the end of the current day. Commissions, fees, intraday trading and new/modified deals, valuation adjustments for which separate regulatory capital approaches have been otherwise specified as part of the rules and valuation adjustments which are deducted from CET 1 are excluded from the HPL. Value adjustments updated daily should usually be included in the HPL”<sup>1450</sup>.
- 11.8.57 As will be seen the main difference between the APL and HPL is the exclusion from the latter of intraday trading and new or modified deals.
- 11.8.58 When applied at a bank-wide level the VaR model must be calibrated at a 99% confidence level. An exception occurs if the actual loss or the hypothetical loss (as described below) of the bank-wide trading book exceeds the corresponding VaR measure given by the model<sup>1451</sup>. If either the daily P&L or the VaR is unable to be calculated then it is also treated as an exception<sup>1452</sup>. Exceptions may, however, be disregarded if they relate to a non-modellable risk factor, the capital charge for that non-modellable risk factor is greater than the actual or hypothetical loss, and the bank’s supervisor is notified and does not object to disregarding the exception<sup>1453</sup>.
- 11.8.59 The number of exceptions are grouped into green, amber and red zones, with the number of exceptions increasing the multiplier referred to above. The green zone comprises 0-4 exceptions. This comprises results that do not suggest a problem with the quality or accuracy of a bank’s model. The multiplier is 1.5. The amber zone comprises 5-9 exceptions. This encompasses situations that raise questions as to the quality or accuracy of a bank’s model. The multiplier varies from 1.7 to 1.92 depending on the number of exceptions. The red zone consists of 10 or more exceptions and indicates that there is almost certainly a problem with the bank’s risk model. In this case the multiplier is 2<sup>1454</sup>.
- 11.8.60 The number of exceptions is calculated over 250 trading days, corresponding to a one year horizon<sup>1455</sup>. Where a bank’s model falls in the amber or red zone the supervisor may revoke model approval if satisfied that the model is inaccurate<sup>1456</sup>. Such revocation is not automatic even in the red zone as it is still possible that the model is adequate, or can be improved to make it so. As stated by the Basel Committee in 2016 in this case “the supervisor should ... begin investigating the reasons why the bank’s model produced such a large number of misses, and should require the bank to begin work on improving its model immediately”<sup>1457</sup>.
- 11.8.61 The Basel Committee explained further in January 2016 the rationale around the three zones as follows:
- “there is no threshold number of exceptions that yields both a low probability of erroneously rejecting an accurate model and a low probability of erroneously accepting all of the relevant inaccurate models. It is for this reason that the Committee has rejected a single threshold.

Given these limitations, the Committee has classified outcomes for the backtesting of the firm-wide model into three categories. In the first category, the test results are consistent with an accurate model, and the possibility of erroneously accepting an inaccurate model is low (green zone). At the other extreme, the test results are extremely unlikely to have resulted from an accurate model, and the probability of erroneously rejecting an accurate model on this basis is remote (red zone). In between these two cases, however, is a zone where the backtesting results could be consistent with either accurate or inaccurate models, and the supervisor should encourage a bank to present additional information about its model before taking action (yellow zone)<sup>1458</sup>.

- 11.8.62 As mentioned above, banks must also carry out backtesting at the *trading desk* level. This is carried out daily<sup>1459</sup>. Backtesting is effected at both the 97.5% and 99% confidence level using each trading desk's VaR over a one year period, with all data equally weighted<sup>1460</sup>. An exception occurs when either the actual or hypothetical loss of the trading desk exceeds the corresponding VaR determined by the bank's model. The same applies where the P&L, or other risk factor, is not available or is impossible to compute.
- 11.8.63 If the number of exceptions exceeds 12 at the 99% confidence level, or 30 at a 97.5% confidence level, in the most recent 12 month period the bank is no longer able to use its model for *that* trading desk. Instead, the trading desk must calculate its capital requirements under the standardised approach<sup>1461</sup>. However, "[t]he designation of being ineligible for internal modelling is not, however, envisaged as being permanent. If P&L attribution and backtesting performance sufficiently improved for a sufficient period of time, the designation for the relevant internal models-based approach could be changed from ineligible to eligible"<sup>1462</sup>.

#### *The profit & loss attribution (PLA) test*

- 11.8.64 This is the second aspect of ensuring enduring model validity. The PLA test compares the daily risk-theoretical P&L (RTPL) with the daily hypothetical P&L (HPL). Its purpose is to:
- (a) measure the materiality of simplifications in banks' internal models used for determining market risk capital requirements driven by missing risk factors and differences in the way positions are valued compared with front office systems; and
  - (b) prevent banks from using internal models where such simplifications are material<sup>1463</sup>.
- 11.8.65 The PLA is defined as "a method for assessing the robustness of banks' risk management models by comparing the risk-theoretical P&L predicted by trading desk risk management models"<sup>1464</sup>.
- 11.8.66 The RTPL is defined as the daily trading desk P&L that is produced by the valuation of the trading desk's risk management model. The model must include all risk factors that are included in the bank's ES model, with supervisory parameters and any risk factors deemed not modellable, but disregarding risk factors not taken into account in the trading desk risk



management model<sup>1465</sup>. Time effects must be treated in a consistent manner in both the HPL and RTPL<sup>1466</sup>.

- 11.8.67 The HPL must be identical to that used for backtesting purposes. The comparison between the RTPL and HPL is intended to determine whether the risk factors in the trading desk's risk management model capture the material drivers of the bank's P&L by assessing if there is a significant degree of association between the two P&L measurements over a suitable time period<sup>1467</sup>.
- 11.8.68 As described in the (now replaced) 2016 Market Risk Standard "[t]he P&L attribution is designed to identify whether a bank's trading desk risk management model includes a sufficient number of the risk factors that drive the trading desk's daily P&L. For the assessment, all of the instruments held within a particular trading desk should be identified and considered as a distinct portfolio. The risk factors for that portfolio that are included in the desk's risk management model must be used to calculate a 'risk-theoretical' P&L. This 'risk-theoretical' P&L is the P&L that would be produced by the bank's pricing models for the desk if they only included the risk factors used in the risk management model. ... This risk-theoretical P&L would be compared to the hypothetical desk-level P&L, based on the mark-to-market value of the trading desk's instruments derived from the bank's pricing models including all risk factors. The risk-theoretical P&L used in P&L attribution must not take into account any risk factors that the bank does not include in its desk's risk management model"<sup>1468</sup>.
- 11.8.69 The frequency and design of the test metrics were changed in 2019 after a 2018 consultation on problems with the original PLA test<sup>1469</sup>. The 2018 consultation document explained: "the objective of the PLA test is to assess the materiality of risks that may be missing from the risk management model due to risk factors that are not included in the model or simplifications in the model's approach to valuation. Beyond these sources of discrepancy between the HPL and RTPL of a given trading desk, additional differences between the two measures of P&L may arise as the result of acknowledged differences or misalignments of data that the bank uses as inputs to calculate each measure"<sup>1470</sup>. These could include differences in time at which the data are collected, and a bank using different data providers to source data<sup>1471</sup>.
- 11.8.70 The calculation of the PLA is based on two test metrics<sup>1472</sup>. These are:
- (a) the correlation between the two time series of P&Ls to assess the level of dependence between the HPL and the RTPL (the Spearman correlation metric). The metric separately ranks (from lowest to highest) the historical 12 month series of daily HPL and RTPL values. A strong correlation will only be observed if the rank ordering of values is closely related between the two time series; and
  - (b) an assessment of how "similar" the distributions of HPL and RTPL are over time by calculating the maximum absolute difference between the probability distributions of the HPL and RTPL over the time series (the Kolmogorov-Smirnov metric)<sup>1473</sup>.

11.8.71 Based on the results of the application of these metrics, each trading desk is allocated to either a green, red or amber zone<sup>1474</sup>. Trading desks in the green zone are eligible for the internal models approach to market risk. Trading desks in the amber zone are subject to a capital surcharge<sup>1475</sup>, whilst trading desks in the red zone are disqualified from use of the internal models approach, and must instead use the standardised approach for market risk capital charges<sup>1476</sup>.

#### *Default risk capital requirement*

11.8.72 As has been mentioned above, Basel III requires banks to determine the default risk capital requirement. The default risk model must meet the general criteria and qualitative standards referred to above<sup>1477</sup>. Default risk is defined as the risk of direct loss due to an obligor's default as well as the potential for indirect losses that may arise from a default event<sup>1478</sup>. Default risk models are based on VaR models. The specific requirements are:

- (a) the default simulation model must have two types of systemic risk factors;
- (b) default correlations must be based on credit spreads or listed equity prices based on 10 years of data that includes a stress period (which may, in practice, mean going back to the financial crisis 15 years' ago);
- (c) clear policies and procedures are required for the correlation calibration process; and
- (d) the VaR calculation is based on a 99.9% one tailed confidence level<sup>1479</sup>. This allows only one excess in one out of 1000 holding periods.

11.8.73 All trading book positions not subject to the standardised approach must satisfy the default risk capital requirement<sup>1480</sup>. Sovereign exposures must be included, and equity positions modelled based on a total loss<sup>1481</sup>.

11.8.74 Due to the relationship between credit spread risk and default risk, banks need approval from their supervisors for each trading desk to model default risk. If this is not forthcoming, the trading desk is required to use the standardised approach<sup>1482</sup>.

11.8.75 If the bank has an IRB approved model for credit risk (see chapter 5) then the probability of default (PD) figures from that model must be used to calculate default risk. If it does not, or if the supervisor deems the PD estimates to be insufficiently robust<sup>1483</sup>, then the bank must compute PD figures using a methodology consistent with the IRB approach to credit risk, as well as satisfying certain specified conditions<sup>1484</sup>. The same applies for loss given default (LGD)<sup>1485</sup>.

11.8.76 The default capital requirement is the greater of:

- (a) the average model requirement measured over 12 weeks; or
- (b) the most recent model measure<sup>1486</sup>.

- 11.8.77 Default risk must be measured for each obligor. Probabilities of default have to be corrected to obtain an objective probability of default. A footnote states that market-implied probabilities of default are not acceptable. Secondly, there is a floor of 0.03%<sup>1487</sup>. It is unclear to us on what basis probabilities of default can be calculated other than based on market factors as by definition the entity will not yet have defaulted. What other evidence can there be than CDS spreads, equity, bond or subordinated debt prices, etc. all of which are market-implied measures of default? Banks cannot be required to have inside information from the entity's management or auditors as this would be illegal. How such "objective" measurements are to be determined is therefore unclear.
- 11.8.78 Netting of long and short positions to the same obligor is allowed, although differences in seniority of positions must be taken into account<sup>1488</sup>. Basis risk between long and short positions must be modelled explicitly<sup>1489</sup>. The model must recognise the impact of correlations between defaults of obligors, including the effect of stress on correlations. This reflects the increase in correlations of defaults observed during the financial crisis. Specified requirements for the determination of stressed correlations are set out including calibrating correlations over a period of at least 10 years<sup>1490</sup>.
- 11.8.79 A bank's model must reflect the effect of issuer and market concentrations, as well as concentrations that may arise within and across product classes during a period of stress<sup>1491</sup>. This is another lesson of the financial crisis.
- 11.8.80 Derivatives with material non-linear behaviour in respect of default (e.g. options) must be reflected in the model<sup>1492</sup>.
- 11.8.81 A bank must calculate the incremental loss relative to the current value that the bank would incur in the event of a loss for each and every position subject to the default capital risk model<sup>1493</sup>. Capital is required to be held against the *incremental* loss from default in excess of any mark-to-market losses already taken into account through the profit and loss account<sup>1494</sup>. This is to prevent double counting of losses.
- 11.8.82 Where a model cannot be used for any given trading desk, then the capital charge will be determined using the standardised approach and then aggregated across all such desks<sup>1495</sup>. This will be added to the capital charge for default risk from all trading desks with model approval.
- 11.8.83 Basel III recognises that given the very high confidence level (99.9%) for default risk models standard backtesting will not be possible. Accordingly, indirect methods to validate model performance are required which may include stress tests, scenario analysis and sensitivity analysis<sup>1496</sup>.

## 11.9 Basel III - The Standardised Approach to Credit Risk

- 11.9.1 We now proceed to examine the standardised approach to market risk. It bears no comparison to the former standardised approach under Basel II (which is broadly retained subject, to a scaling factor, as the simplified standardised approach). As with the internal models-based approach the standardised approach has been successively refined through four consultative

documents, quantitative impact assessments and two standards, the current being published in 2019.

- 11.9.2 As with the models-based approach we will describe the genesis and basis of the new standard as set out in the relevant preparatory documents before moving on to an account of the actual rules. Readers not interested in why the Basel Committee sought such a fundamental change to the standardised approach may skip the next section.

*The first consultative document*

- 11.9.3 As already mentioned, this was published in May 2012. The new standardised approach is stated to serve two purposes: firstly, as a method for calculating capital requirements for banks whose business models does not require a sophisticated measure of market risk measurement and, secondly, as a fall-back in case a trading desk is not approved for the internal models-based approach, or it no longer qualifies for that approach<sup>1497</sup>. The Basel Committee set out the following five design principles for the new standardised approach:

- (a) improved risk sensitivity. The approach should give prudent recognition of genuine hedging and diversification, and reduce the sensitivity gap between the standardised and models-based approaches;
- (b) calibration. The standardised approach should be calibrated via clear, logical and specified processes that reflect differences in asset volatility and instrument type;
- (c) simplicity. Capital requirements should be based on a simple and transparent methodology, placing a limited burden on banks and regulators;
- (d) limited model reliance; and
- (e) being a credible fall-back. The capital charges must be reasonable in terms of magnitude compared to those produced by a well-specified internal model<sup>1498</sup>.

- 11.9.4 Whether the new standardised approach achieves all these objectives will be a matter for readers of the full Basel III standard to decide.

- 11.9.5 Essentially, the Committee sought to address the risk that the threat of model revocation was not credible under the 1996 Market Risk Amendment as the capital charges under the standardised approach were so much higher that a bank risked breaching its minimum capital requirement if model approval was withdrawn.

- 11.9.6 The 2012 consultative document put forward two alternatives for consideration: a partial risk factor approach and a fuller risk factor approach. As the latter was subsequently discarded only the former will be considered briefly in seeking to understand, on an intuitive basis, the new framework which is highly mathematical and formula-driven in its final iteration as the 2019 Basel III standard. Under the partial risk factor approach there are three steps:

- (a) assign all instruments in scope to prescribed “asset buckets” unless they require decomposition;
- (b) a calculation of each “bucket’s” capital charge using supervisor-determined risk weights and correlations; and
- (c) the aggregation of the “buckets” using a supervisory method to determine the capital requirement<sup>1499</sup>.

*The second consultative document*

- 11.9.7 This was published in October 2013 and confirmed adoption of the partial risk factor approach<sup>1500</sup>. This document describes the standard ultimately adopted by the Basel Committee as follows:

“the first step is to decompose instruments into ‘notional positions’. The proposed Accord text sets out principles that should be followed by banks, as well as detailed decompositions of commonly traded instruments. Notional positions will then be allocated to risk buckets. It is expected that a bank should be able to decompose all instruments for the purposes of the standardised approach. However, if this is not possible, then supervisors will have discretion to impose a prudent percentage of either the market value or the notional of the position.

A set of risk buckets has been defined for each asset class. These risk buckets, which have been designed based on a combination of statistical analysis and expert judgment, group positions with similar risk characteristics together. Notional positions are assigned to risk buckets according to certain categorical variables, such as industry sector or credit quality. These buckets have been defined following a statistical procedure combined with a judgmental overlay. The maximum buckets in an asset class is 12. ... If a notional position cannot be allocated to any of the risk buckets in an asset class (for example, because data on categorical variables is not available), it will be allocated to a ‘residual’ bucket for that asset class. Hedging and diversification benefits between the residual bucket and other buckets in the asset class will not be recognised ...”<sup>1501</sup>.

- 11.9.8 The document explains further that “[a] single risk weight will apply to all notional positions assigned to a risk bucket. In addition, at least two regulatory-specified correlation parameters will be defined for each risk bucket. One correlation parameter will be used where positions have the same sign, to recognise diversification, and the other correlation parameter will be used where positions have different signs, to recognise hedging. The correlation parameter for positions with the same sign will be higher than that where positions have different signs. This approach prudently captures the risk to perceived hedging and diversification benefits that arises due to the unstable and time-varying nature of correlation parameters, particularly in times of stress”<sup>1502</sup>.

- 11.9.9 For general interest rate risk and credit spread risk cash flows were originally proposed to be used as a starting point. Instruments would be decomposed into their constituent cash flows, discounted, and then assigned on a proportional basis to nearby maturity points. This proposal was abandoned in

the third consultative document (see below). Having determined the risk measure for each bucket or currency, offsetting and diversification would then be recognised across different buckets to determine the standardised capital requirement for a given asset class using a cross-bucket aggregation formula<sup>1503</sup>.

- 11.9.10 The approach for non-linear financial instruments (e.g. options) involves the allocation of a delta equivalent position in the underlying instrument, which is equal to the delta of the financial instrument multiplied by the underlying notional amount<sup>1504</sup>. Non-delta risks (i.e. risks that are not driven by a change in the price of the underlying, but the risk characteristics of the instrument) are captured through a delta-stripped scenario matrix approach (vega risk)<sup>1505</sup>.
- 11.9.11 The trading book standardised capital requirement is the sum of standardised requirements across all asset classes, with no recognition of diversification or offsetting between asset classes<sup>1506</sup>.

#### *The third consultative document*

- 11.9.12 This document was published in December 2014. Banks objected to the proposed cash flow model outlined above, due to a lack of stored data and the technical requirement to calculate separate discount curves for each instrument<sup>1507</sup>. As a result, the Basel Committee settled on a sensitivity-based approach which requires banks to use price and rate sensitivities, thereby reducing the implementation cost for banks<sup>1508</sup>.
- 11.9.13 According to the third consultative document (which is the foundation of the new standardised approach):
- “a sensitivity-based approach entails reliance on the pricing model of firms. This may improve the risk sensitivity of the standardised approach, but comes at a cost to simplicity and consistency. However, recognising the industry concerns above to be valid, the Committee views the cash flow-based method as even more complex and impractical to design or compute by comparison, without offering any clear advantages in terms of risk capture or comparability. Specifically, the technical challenges involved in prescribing the cash flow of complex instruments were prohibitive in terms of enhancing the proposed standardised approach as a functional fallback to the internal models-based approach”<sup>1509</sup>.
- 11.9.14 However, the basic design features of the second consultative document were retained. The framework would capture both delta and non-delta risks for both non-securitisation and securitisation positions (securitisations are excluded from the internal models-based approach), as well as equity risk, foreign exchange risk and commodity risk. Capital charges are computed at an asset class level, with no recognition of diversification effects across different asset classes<sup>1510</sup>. For options (and positions featuring optionality) both vega risk (the sensitivity of the value of an option to a change in volatility) and curvature risk (which measures the rate of change of delta risk) are required to be modelled<sup>1511</sup>. The Committee also decided to capture “basis risk” within the standardised approach i.e. the risk that the relationship between the prices of correlated instruments weakens over time<sup>1512</sup>, through

a “correlation method” as more sensitive to interest rate and foreign exchange risk<sup>1513</sup>.

*The January 2016 market risk standard*

11.9.15 This document published the Basel Committee’s original market risk standard (although it was replaced in 2019 following further consultation and input from the banking industry). This set out a tripartite capital charge for market risk measured under the standardised approach. This may be summarised as follows<sup>1514</sup>:

- (a) a sensitivities-based method for capital charges based on delta, vega and curvature risk within a prescribed set of risk classes;
- (b) a default risk capital charge with three elements: non-securitisation, securitisation and the correlation trading portfolio within securitisation exposures; and
- (c) a residual add-on applied to the notional amounts of instruments that are non-linear<sup>1515</sup>.

11.9.16 The standard explained that the default risk charge “is calibrated to the credit risk treatment in the banking book to reduce the potential discrepancy in capital requirements for similar risk exposures across the banking book and the trading book”<sup>1516</sup>. This might be seen as a “belt and braces” approach given the prohibition on recognition of regulatory capital benefits from switching positions between both books under Basel III, but is consistent with the Basel 2.5 reforms. Whether it is necessary to impose the same capital treatment on banking and trading book positions given their different characteristics for default risk may be questioned as default risk should usually be small in trading book positions, as the firm should be able to trade out of the position, or hedge it, or if not the position should not be held in the trading book.

11.9.17 The residual add-on was “introduced to capture any other risks beyond the main risk factors already captured in the sensitivities-based method and the Default Risk Charge. It provides for a simple and conservative capital treatment for the universe of more sophisticated trading book instruments for which the Committee has refrained from detailed speculation under the standardised approach, so as to limit excessive risk-taking and regulatory arbitrage incentives”<sup>1517</sup>. *Sed quaere*.

*The fourth consultative document*

11.9.18 This was published in March 2018 and followed dissatisfaction with the ostensibly definitive 2016 standard. This document states that the sensitivities-based method specifies:

- (a) the risk weights that should be applied to the sensitivities for each of the prescribed list of risk factors. Banks are required to multiply their sensitivities to risk factors by supervisory risk weights to estimate the change, on a risk factor by risk factor basis, the value of their trading book portfolios; and

- (b) capital requirements for risk factors are aggregated using a set of formulae using defined correlation assumptions specifying diversification benefits across risk factors<sup>1518</sup>.

11.9.19 Based on evidence provided by banks in the quantitative impact assessment, the Basel Committee identified deficiencies in the following elements of the 2016 standard:

- (a) the approach to determine foreign exchange pairs that are liquid;
- (b) the correlation scenarios applied in the capital calculations; and
- (c) the treatment of non-linear instruments such as options<sup>1519</sup>.

11.9.20 The changes proposed were as follows:

- (a) allowing combinations of currency pairs to benefit from a lower capital requirement;
- (b) adjustments to the capital charge for risk factors judged to be highly correlated; and
- (c) a request for further information from the banking industry on possible double counting of curvature risk in respect of foreign exchange risk<sup>1520</sup>.

11.9.21 Also, based on bank data, the Basel Committee concluded that the capital charges for certain segments of the standardised approach were too high, and reduced them for general interest rate risk by 20-40%, and for equity and foreign exchange risk by 25-50%<sup>1521</sup>. Amendments were also proposed for multi-underlying options and index instruments<sup>1522</sup>.

#### *The 2019 market risk standard*

11.9.22 The final results of the Committee's deliberations on the new Market Risk Standard were published in 2019. According to the 2019 *Explanatory Note* published by the Committee:

"The framework specifies:

- A set of risk factors which are considered to be the main market variables that affect the value of banks' trading portfolios. Similar risk factors are grouped together into "buckets" (eg for equities, buckets are defined by industrial sector). Banks calculate the sensitivity of their trading book portfolio to movements in the value of each of the risk factors.
- Risk weights to be applied to those risk factors. Risk weights have been calibrated to stressed market conditions to ensure a calibration aligned with the internal models approach. Banks must scale up their 'sensitivities' to each risk factor based on the prescribed risk weight to estimate how much value the portfolio would lose if a shock was to happen to the risk factor.



- A methodology for aggregating the losses calculated for each risk factor shock to determine the loss for the scenario at the portfolio level. In order to ensure a level of risk sensitivity, the aggregation method recognises a degree of diversification benefit between risk factor-level losses (applying different levels of assumed correlation between shocks applied to risk factors in the same buckets and those in different buckets)”<sup>1523</sup>.

#### 11.9.23 The Committee adds:

“The above steps are applied separately for three different types of risk and added as a simple sum to calculate the sensitivities-based method capital requirement:

- Delta risk - the potential loss due to a small change in price of an equity or commodity, or a small change in an interest rate, credit spread, or FX rate.
- Vega risk - the potential loss due to a change in the implied volatility of an option (for instruments that feature optionality).
- Curvature risk - the potential incremental loss beyond delta risk when large movements occur in risk factors of instruments that feature optionality”<sup>1524</sup>.

#### 11.9.24 In terms of the matters consulted on in 2018 the final determination of the Basel Committee was as follows:

- “Under the FX risk class, the scope of currency pairs that are considered liquid, and are therefore subject to lower risk weights, has been broadened. The overall approach to FX risk has also been amended so that banks, subject to supervisory approval, may calculate FX risk with respect to the currency in which they manage their trading business (their “base currency”) rather than with respect to their reporting currency. ...
- The equity risk and the credit spread risk classes have been enhanced, with new ‘index’ buckets for equity and credit spread risks introduced to provide a simple approach that does not require the identification of each underlying position in an index to calculate the capital requirements for equity and credit indices.
- The calculation of curvature risk capital requirements for options has been modified to (i) apply consistent shocks to similar risk factors; (ii) address double-counting of FX risk for certain instruments; and (iii) remove a potential cliff effect in the aggregation formula for capital requirements. The scope of the curvature risk calculation has been broadened to allow banks to include bonds and other instruments without optionality when curvature risk is managed holistically across options and other instruments.
- With regard to the aggregation of risk sensitivities, the ‘low correlations’ scenario has been modified to ensure it does not produce unrealistically

low correlations for risk factors that are considered to be highly correlated in stressed market conditions”<sup>1525</sup>.

11.9.25 With this introduction we proceed to describe the new standardised approach to market risk.

## 11.10 Basel III - Final Standardised Approach to Market Risk

11.10.1 All banks, except those allowed to use the simplified standardised approach, must calculate their capital requirements under the standardised approach<sup>1526</sup>. This includes banks with model approval for one or more trading desks<sup>1527</sup>.

11.10.2 All banks must also use the standardised approach for securitisation positions and equity investments in funds that cannot be looked through to the underlying<sup>1528</sup>.

11.10.3 Under the final Basel III standard the standardised approach is the sum of three components: the capital requirement calculated under the sensitivities-based approach, the default risk capital requirement and a residual add-on<sup>1529</sup>. As foreshadowed above, the sensitivities-based capital charge is the sum of three distinct elements: delta risk (measuring sensitivities to regulatory delta risk factors), vega risk (based on sensitivities to regulatory vega risk factors) and curvature risk (which captures the incremental risk not covered by the delta measure for price changes in an option)<sup>1530</sup>. The three former risk measurements are aggregated using specified correlation parameters to address diversification benefits between risk factors. Three sensitivities-based risk scenarios must be calculated to address the risk that correlations may increase or decrease in periods of stress<sup>1531</sup>.

11.10.4 The default risk capital requirement is designed to capture the jump-to-default risk for instruments subject to credit risk, calibrated on the capital charge in the banking book to reduce the risk of regulatory arbitrage between the two books. Some hedging is allowed<sup>1532</sup>.

11.10.5 The add-on is “introduced to ensure sufficient coverage of market risk for instruments with an exotic underlying and other instruments bearing residual risks”<sup>1533</sup>.

11.10.6 As has been seen, the sensitivities-based method consists of a prescribed list of risk factors in respect of which a bank is required to determine the delta, vega and curvature risk capital requirements. These are then aggregated, firstly within risk buckets (risk factors with common characteristics) and then across risk buckets within the same risk class as defined below<sup>1534</sup>.

11.10.7 For the purposes of applying the standardised approach the following definitions apply:

(a) A “risk factor” is a variable that affects the value of a trading book instrument (e.g. the price of an equity, or the interest rate on a bond)<sup>1535</sup>. This is described in more detail below.

(b) The “delta risk” is the linear estimate of the change in the value of a financial instrument due to the movement in a risk factor. The risk factor

could be the price of an equity or commodity, or a change in an interest rate, credit spread or foreign exchange rate<sup>1536</sup>.

- (c) The “vega risk” represents the potential loss resulting from the change in value of a derivative due to a change in the value of a derivative as a result of a change in the implied volatility of its underlying<sup>1537</sup>.
- (d) “Curvature risk” is the additional potential loss beyond delta risk as a result of a change in a risk factor for financial instruments with optionality (which is not restricted to options). This is calculated based on two stress scenarios involving an upward shock and a downward shock to each regulatory risk factor<sup>1538</sup>. In this respect the curvature risk calculation differs from delta and vega risk.
- (e) A “risk bucket” is a set of risk factors that are grouped together by common characteristics (e.g. all interest rates in a common currency)<sup>1539</sup>. The definitions of each risk bucket is set out in the text of Basel III and is examined briefly below.
- (f) There are seven risk classes under the standardised approach:
  - (i) general interest-rate risk (GIRR);
  - (ii) credit spread risk (CSR) for non-securitisation positions;
  - (iii) credit spread risk (CSR) for securitisation positions;
  - (iv) credit spread risk (CSR) for securitisation positions included in the correlation trading portfolio (see below);
  - (v) equity risk;
  - (vi) commodity risk; and
  - (vii) foreign exchange (FX) risk<sup>1540</sup>.
- (g) A “risk position” is the portion of the risk of an instrument that relates to a risk factor. The standardised approach sets out how to calculate the delta, vega and curvature risk<sup>1541</sup>.
- (h) The “risk capital requirement” is the amount of capital a bank is required to hold under the standardised approach calculated as an aggregation of risk positions, first at the bucket level and then across risk buckets within a risk class as set out in the Basel III text<sup>1542</sup>.

#### *The correlation trading portfolio*

11.10.8 The correlation trading portfolio has been mentioned above and is a subset of securitisation positions held in a bank’s trading book that meet certain requirements and benefit from a more lenient capital treatment. To fall within the securitisation correlation portfolio a position must satisfy either one of the two following requirements (denoted under (1) and (2)):

- 1(a) the securitisation position is not a re-securitisation position, nor a derivative of a securitisation position that does not provide a *pro rata* share in the proceeds of a securitisation tranche;
- 1(b) all reference entities are single-name products, including single-name credit derivatives, for which a liquid two-way market exists, including traded indices on these reference entities;
- 1(c) the instrument does not reference an underlying that is treated as a retail exposure, a residential mortgage exposure, or a commercial exposure; and
- 1(d) the instrument does not reference a claim on a special purpose entity; or
- (2) the instrument is a non-securitisation hedge to a position as described above<sup>1543</sup>.

11.10.9 A two-way market is deemed to exist where there are *bona fide* offers to buy and sell so that a price reasonably related to the last sales price or to a current *bona fide* competitive quote exists<sup>1544</sup>.

#### *Application of the sensitivities-based method*

11.10.10 All instruments subject to the sensitivities-based method (i.e. all trading book positions other than exotic derivatives) are subject to **delta risk**<sup>1545</sup>. Exotic derivatives include longevity swaps, weather derivatives, derivatives based on market volatilities, etc.<sup>1546</sup>.

11.10.11 The following instruments are additionally subject to **vega risk** and **curvature risk**:

- (a) any instrument with **optionality**. Optionality obviously includes all options. In addition, instruments with an embedded option, such as convertibility into another instrument, or rate-dependent prepayment is covered. This includes calls, puts, caps, floors, swaptions, barrier options and exotic options;
- (b) any instrument with an embedded **prepayment option**. This is a debt instrument that grants the debtor the right to prepay part or all of the principal amount before the contractual maturity date without being obliged to compensate the lender/holder for any foregone interest (which is quite common). Such options are subject to vega and curvature risk in respect of interest rate risk and CSR (either non-securitisation or securitisation, as the case may be). If the prepayment option is, in addition, a behavioural option, then there may be a regulatory risk add-on (RRAO). This is considered further below;
- (c) instruments whose **cash flows** cannot be written as a linear function of the underlying notional instrument. An example is a plain-vanilla option where the cash flows are not linear as they are the maximum of the spot and strike price<sup>1547</sup>.

11.10.12 Instruments that do not have optionality, but which the bank manages holistically with instruments with optionality may be subjected to curvature risk at the bank's discretion. However, in this case, the bank must use this approach consistently over time<sup>1548</sup>.

*Calculation of the delta and vega capital requirements for each risk class*

11.10.13 For each risk class a bank must determine its positions to a set of prescribed risk factors, risk weight those sensitivities, and aggregate the resulting risk weights separately for delta and vega risk using the following step-by-step approach:

- (a) for each risk factor the Basel III text specifies a sensitivity;
- (b) sensitivities to each risk factor must be netted to give a net sensitivity across all instruments in the portfolio. Positions in opposite directions are offset;
- (c) the weighted sensitivity is the product of the net sensitivity and the risk weight defined in the Basel III text;
- (d) when determining aggregation within each risk bucket the risk position for both delta and vega risk is determined by aggregating the weighted sensitivities to risk factors within that bucket using a prescribed formula; and
- (e) in determining across risk bucket positions, the delta and vega risk capital requirement is determined by aggregating positions for delta and vega risk using a different formula<sup>1549</sup>.

*Curvature risk*

11.10.14 For each risk factor curvature risk capital requirements are calculated based on an upward shock and a downward shock to each prescribed risk factor based on a calculation of incremental loss for instruments sensitive to that risk factor beyond that captured by the delta risk capital requirement. The size of the shock is specified in the Basel III text. If the price of an instrument depends on several risk factors, then curvature risk must be determined separately for each risk factor. The net curvature risk capital requirement is determined through a prescribed formula. For within risk bucket aggregation a correlation formula applies. Curvature risk positions must then be aggregated across all buckets in each risk class. Again, a formula applies<sup>1550</sup>.

*Aggregation of risks*

11.10.15 To address the risk that correlations may increase or decrease during a period of financial stress the aggregation of bucket-level capital requirements, and risk class capital requirements for delta, vega and curvature risk have to be repeated according to three different scenarios for the correlation between risk factors within a risk bucket and the correlation across risk buckets within a risk class. These are:

- (a) the "medium" correlations scenario;

- (b) the “high” correlations scenario; and
- (c) the “low” correlations scenario<sup>1551</sup>.

11.10.16 Unsurprisingly, the general prescribed correlation parameters are modified to reflect the possible performance of the correlations in a situation of financial stress<sup>1552</sup>.

11.10.17 The total capital requirement under the sensitivities-based method is aggregated as follows:

- (a) for each of the three correlation scenarios (see preceding paragraph) the bank sums up the delta, vega and curvature capital requirements for that scenario; and
- (b) the actual capital requirement is the largest of the three scenario capital requirements<sup>1553</sup>.

11.10.18 We will now proceed to consider the relevant risk factors.

*Risk factors for delta, vega and curvature risk*

11.10.19 The following risk factors are relevant: general interest rate risk (GIRR), credit sensitivity risk (non-securitisation), credit sensitivity risk (securitisation), credit sensitivity risk (securitisation: correlation trading portfolio), equity risk, commodity risk and foreign exchange risk. These will now be examined in a little more detail.

- (a) **GIRR.** The delta risk factors are defined along two dimensions: (1) a risk-free<sup>1554</sup> yield curve for each currency and (2) the following tenors/maturities of the debt instrument: 0.25 years, 0.5 years, one year, two years, three years, five years, ten years, 15 years, 20 years and 30 years, to which each risk factor must be assigned. The delta risk factors include a flat curve of market-implied inflation rates with the term structure of interest rates not included as a risk factor. All inflation risks must be aggregated for a single currency to one number via a simple sum. The GIRR delta risk factors also include one of two possible cross-currency basis risk factors for each currency (each GIRR bucket), with the term-structure of interest rates not recognised. The two recognised currencies are the USD and EUR. Other cross-currency bases are computed on the basis of the USD or EUR (but not both)<sup>1555</sup>.

The vega GIRR for each currency is the implied volatility of options defined using two dimensions:

- (i) the maturity of the option mapped to one or several of the following: 0.5 years, one year, three years, five years and ten years<sup>1556</sup>; and
- (ii) the residual maturity of the underlying of the option at the expiry date of the option for the same set of tenors<sup>1557</sup>.

Curvature GIRR risk factors are defined along one dimension: the constructed risk-free yield curve per currency disregarding the term structure in interest rates. Inflation and cross-currency basis risk are ignored<sup>1558</sup>.

- (b) **CSR (non securitisation).** Delta risk factors are defined along two dimensions:
- (i) The issuer credit spread curves (bonds and CDS); and
  - (ii) Maturities of 0.5 years, one year, three years, five years and ten years<sup>1559</sup>.

The vega risk factors are the implied volatilities of options that reference the relevant issuer names as the underlying (bonds, credit default swaps) based on the maturity of the option. This is defined in Basel III as the implied volatility of the option defined at the same maturities as for delta<sup>1560</sup>.

Curvature risk factors are defined by the relevant issuer credit spread curves<sup>1561</sup>. According to Hull<sup>1562</sup>:

“The curvature risk charge is a capital charge for a bank’s gamma risk exposure under the standardized approach. Consider the exposure of a portfolio to the  $i$ th risk factor. Banks are required to test the effect of increasing and decreasing the risk factor by its risk weight  $W_i$ . If the portfolio is linearly dependent on the risk factor, the impact of an increase in  $W_i$  in the risk factor is  $W_i\delta_i$ . Similarly, the impact of a decrease in  $W_i$  in the risk factor is  $-\delta_iW_i$ . To evaluate the curvature net of the delta effect, the standardized therefore calculates

1.  $W_i\delta_i$  minus the impact of a increase of  $W_i$  in the risk factor; and
2.  $-W_i\delta_i$  minus the impact of a decrease in the risk factor of  $W_i$ .

The curvature risk charge for the risk factor is the greater of these two”.

And:

“The curvature risk charges for different risk factors are combined to determine a total curvature risk charge. When diversification benefits are allowed, aggregation formulas broadly similar to those used for deltas are used with correlations specified by the Basel Committee”<sup>1563</sup>.

- (c) **CSR (securitisation).** Delta risk factors are calculated with respect to the spread of the tranche rather the underlying instruments. The following maturities are relevant: 0.5 years, one year, three years, five years and ten years<sup>1564</sup>.

Vega risk factors are implied volatilities of options that represent credit spreads as underlyings (bond and CDS) based on the same maturities as for the delta risk factors<sup>1565</sup>.

The curvature risk factors are defined by the relevant tranche credit spread curves<sup>1566</sup>.

- (d) **CSR (securitisation: correlation trading portfolio).** Delta risk factors are computed with respect to names underlying the securitisation or nth-to-default<sup>1567</sup>. Delta risk factors are defined by reference to the underlying credit spread curve and specified maturities (the same as for other securitisation positions)<sup>1568</sup>.

Vega risk factors are the implied volatilities of options that reference correlation trading portfolios credit spreads as underlyings based on the maturity of the option with the same maturities<sup>1569</sup>.

The curvature risk factors for this portfolio are the underlying credit rate spreads<sup>1570</sup>.

- (e) **Equity risk factors.** For delta risk the risk factors are the spot and repo rates<sup>1571</sup>.

For vega risk, the risk factors are the implied volatilities of options referencing the equity spot price based on the maturity of the option over maturities of 0.5 years, one year, three years, five years and ten years. There is no vega risk capital requirement for equity repos<sup>1572</sup>.

The equity curvature risk factors are all the equity spot prices, with no curvature risk capital requirement for repos<sup>1573</sup>.

- (f) **Commodity risk factors.** The commodity delta risk factors are generally commodity spot prices (although sometimes for certain commodities the forward price can be used). Two dimensions are defined: the legal terms on place of delivery of the commodity<sup>1574</sup>, and the time to maturity of the traded instrument calculated based on 0 years (spot), 0.25 years, 0.5 years, one year, two years, three years, five years, ten years, 15 years, 20 years and 30 years<sup>1575</sup>.

Vega risk factors are the implied volatilities of options referencing commodity spot prices mapped to the following maturities: 0.5 years, one year, three years, five years and ten years<sup>1576</sup>.

Curvature risk factors are defined based on the constructed curve (without a term structure) of commodity spot prices<sup>1577</sup>.

- (g) **FX risk factors.** The delta FX risk factors are all the exchange rates between the bank's reporting currency and the currency in which the exposure is denominated, with the possibility (with supervisory approval) of relying on a base currency instead of the reporting currency)<sup>1578</sup>.

Vega FX risk factors are the implied volatilities of options referencing exchange rates between currency pairs based on specified maturities<sup>1579</sup>.

Curvature FX risk factors are all the exchange rates between the currency in which an instrument is denominated and the reporting currency,



although, with supervisory approval, a base currency may be used as described above in relation to delta risk<sup>1580</sup>.

No distinction is required for all FX risk factors between onshore and offshore variants of a currency<sup>1581</sup>, although there may be significant differences in market price<sup>1582</sup>.

#### *Calculating the capital charge*

- 11.10.20 For each risk factor (as defined above) sensitivities are calculated on the basis of a change in the market value of the instrument as a result of applying a specified shift to each risk factor, assuming all other relevant risk factors are held at the current level<sup>1583</sup>.
- 11.10.21 Banks are therefore required to use a pricing model to apply the sensitivities-based approach. If they cannot then the fall-back simplified standardised approach may be available (at supervisory discretion). The pricing model must be used by an independent risk control unit to report to senior management.
- 11.10.22 For each asset class, the Basel III test sets out how to calculate delta risk<sup>1584</sup>. The precise formulae will not be described here. The basic idea is to assess the effect of a small shift in the spot price on the market value of the instrument. For instruments subject to vega risk (e.g. options) the vega is multiplied by the implied volatility of the option or other instrument<sup>1585</sup>. There is a specific treatment for options without a maturity, options without a strike or barrier, options with multiple strikes and barriers, and correlation trading securitisation positions which do not have an implied volatility<sup>1586</sup>.
- 11.10.23 Index instruments, and multiple underlying options should generally be subjected to a “look through” approach<sup>1587</sup>. The same, generally, applies to funds<sup>1588</sup>. Positions that cannot be “looked through”, or where the bank does not have access to daily price quotes and knowledge of the mandate, are excluded from the trading book, and instead attract a 100% capital requirement<sup>1589</sup> (equivalent to a deduction from capital).
- 11.10.24 The Basel III text sets out at length the supervisory risk buckets, risk weights and correlation factors banks are required to use in respect of delta risk, vega risk and the calculation of curvature risk, including many formulae<sup>1590</sup>. It is outside the scope of this chapter to go into the detailed requirements.

#### *Default risk capital requirement (DRC)*

- 11.10.25 As was mentioned at the outset, when considering the standardised approach to market risk there are three components: the sensitivities-based approach (summarised above), the default risk capital requirement and the residual risk add-on or RRAO. The latter two will now be considered.
- 11.10.26 The DRC capital charge is intended to capture the jump-to-default (JTD) risk that may not be captured by credit spread shocks under the sensitivities-based method explained above. The DRC capital charges provide some limited recognition of hedging<sup>1591</sup>.

11.10.27 The DRC is calculated by reference to all trading book instruments that are subject to default risk. This constitutes:

- (a) non-securitisation portfolios;
- (b) securitisation portfolios; and
- (c) securitisation positions held within the correlation trading portfolio<sup>1592</sup>.

11.10.28 In calculating the DRC under the standardised approach the following steps must be taken:

- (a) the gross jump-to-default (JTD) risk is calculated separately for each exposure;
- (b) for each exposure to each obligor long and short positions are netted to produce a single net long or short position;
- (c) each net JTD risk position is then allocated to a supervisory bucket;
- (d) within each bucket a hedge-benefit ratio is calculated using net long and net short JTD positions. This is a discount factor that reduces the amount of net short positions that can be netted against net long positions within each risk bucket. Once this is done, a prescribed risk weight is applied; and
- (e) the DRC is the sum of all DRC capital requirements across all risk buckets<sup>1593</sup>.

11.10.29 No diversification benefit is recognised between the DRC calculation for: (1) non-securitisations, (2) securitisations and (3) securitisations recognised within the correlation trading portfolio<sup>1594</sup>.

11.10.30 At national discretion, claims on sovereigns, public sector entities that present sovereign risk and multilateral development banks may be excluded from the DRC calculation. The criteria are the same as under the standardised approach for credit risk discussed in chapter 4.

11.10.31 We will now examine the DRC framework in more detail.

#### *Gross jump-to-default (JTD) positions*

11.10.32 This is calculated on an exposure-by-exposure basis. So a long exposure to IBM shares and a short exposure to the same issuer are separate exposures<sup>1595</sup>. A long position is a position that exposes the bank to loss in the event of a default. For derivatives, again the question is whether the bank will suffer a loss in the event of a default. Thus, a sold put option, or CDS, is treated as a long position<sup>1596</sup>. The gross JTD calculation is a function of the loss given default of the position and the cumulative P&L figure for that exposure<sup>1597</sup>. This is entirely logical, as otherwise losses already incurred through the P&L would not be taken into account when calculating the JTD, thereby exaggerating the maximum potential loss should the obligor default. For

instruments that have incurred a total loss through the P&L there is no separate DCR as the instrument has been written off as a total loss.

11.10.33 The loss-given-default under the standardised approach is based on supervisory parameters. These are as follows:

- (a) equities and subordinated debt instruments: 100%;
- (b) senior debt: 75%; and
- (c) covered bonds: 25%<sup>1598</sup>.

11.10.34 The notional amount is used to determine the loss of principal at default, and the mark-to-market figure to determine the net loss (to avoid double counting, see above). The following specifications apply. For a bond, the notional is the face value. For a credit derivative or put option it is the notional amount of the contract. For a call option the JTD is zero as the call option would not be exercised in a default, and the loss will instead be recognised through the P&L account<sup>1599</sup>.

11.10.35 As the JTD is calculated over a one year horizon, exposures with a shorter maturity are scaled down to a fraction of a year. Exposures over one year are not scaled up<sup>1600</sup>. For exposures with a maturity of under three months, there is a three month floor<sup>1601</sup>.

11.10.36 Once the gross positions have been determined, netting applies. The following rules are applicable. Long and short positions are netted provided the short position has the same or lower seniority to the long position. Thus a short position in an equity can be netted with a long position in a bond, but not *vice versa*. For guarantees, the *Basel II*, framework applies (*quaere* if this is a mistake). In cases of maturity mismatches, where the exposure is longer than one year the mismatch is ignored. In other cases a time-weighted approach applies<sup>1602</sup>.

11.10.37 For the DCR capital charge for all *non-securitisation* positions there are three risk buckets: (1) corporates, (2) sovereigns and (3) local governments and municipalities<sup>1603</sup>. Hedging *within* buckets is recognised as follows. The hedging benefit is the ratio of net long JTD positions to net short JTD positions, and the absolute value of net short JTD positions (based on actual and not risk-weighted values)<sup>1604</sup>.

11.10.38 In calculating the risk-weighted JTD, default risk weights are set based on the credit quality of the obligor. The following risk weights apply:

Default risk weights for non-securitisations by credit quality category	
Credit quality	Risk weight
AAA	0.5%
AA	2%
A	3%
BBB	6%

Default risk weights for non-securitisations by credit quality category	
Credit quality	Risk weight
BB	15%
B	30%
CCC	50%
Unrated	15%
Default	100%

- 11.10.39 The capital requirement for each bucket is determined as the sum of the risk-weighted net long JTD, the hedge benefit ratio (see above) and the sum of risk-weighted short net JTD positions, calculated across the above credit weighting bands<sup>1605</sup>. No alternative is provided for jurisdictions that do not allow the use of credit rating agency ratings, unlike the standardised approach to credit risk.
- 11.10.40 No hedging is allowed between different buckets, and the DRC capital requirement for non-securitisations is the simple sum of the bucket level capital requirements.
- 11.10.41 The default capital requirement for securitisations is determined as follows. When calculating the gross JTD on securitisation positions, exactly the same procedure is followed as set out above, except no loss-given-default (LGD) figure is applied. The reason is that the LGD is already captured in the default-risk weights, so this is necessary to avoid double counting. The JTD is therefore simply the market value of the tranche<sup>1606</sup>. When it comes to netting and hedging, the underlying names, or a non-tranched index position, may be decomposed into the equivalent tranches that cover the entire tranche structure<sup>1607</sup>.
- 11.10.42 The *net* JTD position is restricted to specific securitisation exposures (i.e. tranches with the same underlying pool of exposures). No netting is permitted between different tranches even if they have the same attachment and detachment points. Instead of relying on credit quality (as applies to non-securitisation positions) the following treatment is mandated. The default risk weights are based on the banking book rules for securitisation exposures, with an assumed maturity of one year to avoid double counting as credit migration risk in the trading book is already captured in the credit spread capital requirement. Individual cash securitisation positions can be capped at the fair value of the transaction<sup>1608</sup>. No hedging is recognised between different buckets<sup>1609</sup>.
- 11.10.43 For securitisation positions held within the correlation trading portfolio the following rules apply. The gross JTD figure is the same as for all other securitisation positions<sup>1610</sup>. For single-name and index hedges the gross JTD is the market value<sup>1611</sup>. A specific treatment is provided for nth-to-default credit derivatives based on their attachment and detachment positions<sup>1612</sup>.
- 11.10.44 When calculating the net JTD, exposures, otherwise identical (except for maturity), may be netted. The same rules apply for non-securitisation

positions. Long and short positions that are perfect replications through decomposition may be netted. Different tranches may not be netted<sup>1613</sup>.

- 11.10.45 In calculating default risk on securitisation positions each index is defined as a bucket of its own<sup>1614</sup>. Bespoke securitisation tranches should be allocated to the index bucket they are a bespoke tranche of<sup>1615</sup>. The default risk weights for securitisations applied to tranches are based on the corresponding risk weight for banking book instruments, subject to a one year maturity, as elsewhere in the trading book<sup>1616</sup>. Securitisations in the correlation trading portfolio are subject to a similar treatment for non-securitisation positions, with a modified hedge benefit ratio, and the possibility of negative DRC requirements at the bucket level<sup>1617</sup>.
- 11.10.46 The total DRC capital requirement for correlation trading portfolio securitisations is determined by aggregating bucket-level capital requirements<sup>1618</sup>.

*The residual risk add-on (RRAO)*

- 11.10.47 Because the Basel Committee considered that the sensitivities-based model, and the DRC, did not exhaust all risks for banks applying the standardised approach to credit risk, the Committee decided to impose an add-on for other risks. The RRAO “is to be calculated for all instruments bearing residual risk separately in addition to other components of the capital requirement under the standardised approach”<sup>1619</sup>. In January 2019 the Committee explained:

“The final component of the revised standardised approach is the residual risk add-on. This provides a simple, conservative capital requirement for any other risks not addressed by the main risk factors included in the sensitivities-based method or standardised DRC requirement. The residual risk add-on is the simple sum of gross notional amounts of instruments with residual risks, multiplied by a risk weight of 1.0% for instruments with an exotic underlying (eg weather derivatives) or 0.1% for instruments with other residual risks (eg complex derivatives such as barrier options)”<sup>1620</sup>.

- 11.10.48 The instruments subject to the RRAO are instruments with an “exotic” underlying and instruments bearing “other residual risks”<sup>1621</sup>. An “exotic underlying” consists of “trading book instruments with an underlying exposure that is not within the scope of delta, vega or curvature risk treatment in any risk class under the sensitivities-based method or default risk capital (DRC) requirements in the standardised approach”<sup>1622</sup>. A footnote states “[e]xamples of exotic underlying exposures include: longevity risk, weather, natural disasters, future realised volatility (as an underlying exposure for a swap)”<sup>1623</sup>. It is clearly a residual category, that will in the first instance be left to banks to determine, but subject to supervisory guidance and review. The note is clearly non-exhaustive, as the capacity of banks to create new derivative instruments is essentially limitless. For example, terrorism derivatives (based on the likelihood and severity of a future terrorist attack) would be covered.

- 11.10.49 MAR states that instruments bearing other residual risks are the following:

(a) instruments subject to vega or curvature risk capital requirements in the trading book with pay-offs that cannot be written or perfectly replicated

as a finite linear combination on vanilla options with a single equity price, commodity price, exchange rate, bond price, credit default swap price or interest rate swap [i.e. most complex derivatives]; or

- (b) instruments which fall under the definition of the correlation trading portfolio, except for those instruments that are recognised in the market risk framework as eligible hedges for correlation trading exposures<sup>1624</sup>.

11.10.50 The problem with this definition is that it is ambiguous as to which instruments are subject to the RRAO, and differences in judgment between banks and national regulators may be expected.

11.10.51 MAR sets out a “non-exhaustive” list of other residual risks “that may fall within the criteria” (but need not) including:

- (a) gap risk, i.e. a significant change in vega parameters in options due to small movements in the underlying, resulting in “hedge slipping”. According to the Basel III text this includes all path-dependent options, such as barrier options, Asian options<sup>1625</sup> and all digital options<sup>1626</sup>;
- (b) correlation risk. This is the risk of a correlation parameter necessary for the determination of the value of an instrument with multiple underlyings, such as basket options<sup>1627</sup>, best-of-options, spread options<sup>1628</sup>, Bermudan options<sup>1629</sup> and quanto options<sup>1630</sup>. (Bermudan options need not have multiple underlyings and are a hybrid between American and European options); and
- (c) behavioural risk. This is the risk of a change in exercise or pre-payment outcomes, such as fixed-rate mortgage products where retail clients may take decisions other than motivated by financial gain (the text refers to demographic factors or other social factors)<sup>1631</sup>. What these may be is left unexplained<sup>1632</sup>.

11.10.52 The Basel III text states that the following criteria will not “cause” an instrument to be subject to the RRAO (although they may in specific cases):

- (a) risk from a cheapest-to-deliver option<sup>1633</sup>;
- (b) smile risk. This is defined as the risk of a change in an implied volatility parameter necessary for determining the value of an instrument with optionality relative to the implied volatility of other instruments’ volatility with the same underlying and maturity, but different moneyness<sup>1634</sup>;
- (c) correlation risk arising from multi-underlying European or American plain vanilla options, and from options that can be written as a linear combinations of such options (including index options);
- (d) dividend risk arising from a derivative instrument whose underlying does not consist solely of dividend payments; and
- (e) index instruments and multi-underlying options that satisfy specified criteria<sup>1635</sup>.

### *Calculation of the RRAO*

11.10.53 The RRAO is additional to any capital charge under the standardised approach as follows:

- (a) the scope of instruments must not have an impact in increasing or decreasing the delta, vega or curvature risk under the (sensitivities-based) standardised approach<sup>1636</sup>; and
- (b) the RRAO is the sum of gross notional amounts of the instruments deemed to bear a residual risk multiplied by a risk weight as follows: (1) if the underlying is “exotic” then the risk weight is 1%; and (2) if the instrument bears other residual risks is 0.1%<sup>1637</sup>.

11.10.54 It should be noted that these are absolute figures and not risk weights, so a 1% capital charge is 1% of the gross notional amount and not a 1% risk weight.

11.10.55 If a bank cannot satisfy its supervisor that the RRAO provides a sufficiently prudent capital charge, then the supervisor may impose an additional capital charge under Pillar 2<sup>1638</sup>. This reflects the rule that the Basel standards are only minimum requirements.

## **11.11 Basel III - The Simplified Standardised Approach**

11.11.1 The original 2016 Market Risk Standard contained only versions of the models-based approach and the standardised approach. However, in a consultative document published in June 2017 the Committee observed:

“As a standardised approach, however, the complexity of the SbM [sensitivities-based method] may pose challenges for some banks (eg banks with a low concentration of trading book activity and smaller banks that typically do not have sufficient infrastructure for computing the SbM). Moreover, in some jurisdictions, large banks face less complex risks. Broadly speaking, the current requirements of the SbM make the revised market risk framework’s standardised approach difficult or not necessarily appropriate to implement and adopt across all Basel Committee on Banking Supervision member jurisdictions and non-member jurisdictions”<sup>1639</sup>.

11.11.2 The consultative document proposed a reduced sensitivities-based method, including removal of capital calculations for vega and curvature risk, with, as an alternative, a recalibrated version of the Basel II standard. In a further consultative document published in March 2018, the Committee concluded that an amended version of the latter was appropriate. Basically, the change from the 1996 standard was to apply a multiplier to the capital calculation based on the calculation for interest rate risk, equity risk, commodity risk and foreign exchange risk. According to the March 2018 consultative document:

“The recalibration proposed is intended to make the Basel II standardised approach’s calibration comparable with, but slightly more conservative than, the revised ‘full’ standardised approach. Given its relatively more conservative calibration, the Committee does not propose to specify eligibility requirements for banks that may use this approach. Nevertheless, the Committee notes that the simplicity of the approach means that it may not

be appropriate for banks that (i) are globally systemically important banks (G-SIBs); (ii) use internal models for determining the market risk capital requirement for part of their trading book; or (iii) maintain correlation trading portfolios<sup>1640</sup>.

- 11.11.3 The 2019 Market Risk Standard states that “[s]upervisors may allow banks that maintain smaller or simpler trading books to use the simplified alternative to the standardised approach”<sup>1641</sup>. Supervisors may wish to consider the criteria listed immediately above and “[t]he use of the simplified alternative is subject to supervisory approval and oversight. Supervisors can mandate that banks with relatively complex or sizeable risks in particular risk classes apply the full standardised approach” even if the indicative criteria are not met<sup>1642</sup>. The position seems to be that there is a strong presumption that G-SIBs, banks using the internal-models approach for any of their trading desks or banks with a correlation trading portfolio *may not* use the simplified standardised approach, although national supervisors have discretion whether or not to permit it. However, given the reasons that the Basel Committee articulated for adopting the simplified approach, it ought in principle to be available for banks with smaller or simpler trading books. If a bank cannot determine the full standardised approach capital charge, or only could at excessive cost, then we expect regulators will allow its use, particularly given the intended calibration which is designed to produce higher capital charges than under the standardised approach.
- 11.11.4 When publishing the 2019 Market Risk Standard the Committee stated that the existing Basel 2.5 “approach will be retained as a simplified alternative to the revised standardised approach, subject to the application of specified scalars to ensure a sufficiently conservative calibration of capital requirements for these banks. The scalars per risk class are set at: 1.3 for interest rate risk; 3.5 for equity risk; 1.9 for commodity risk; and 1.2 for FX risk. As the scalars are multiplied by the capital requirement calculated under the Basel 2.5 framework, the scalar of 1.3 for the interest rate risk means a 30% increase in capital requirements”<sup>1643</sup>.
- 11.11.5 MAR 40 sets out the simplified standardised approach including the rules for determining capital requirements for interest rate, equity, commodity and foreign exchange risk. The capital requirement is the sum of the capital charges for these four risk classes<sup>1644</sup>.

#### *Interest rate risk*

- 11.11.6 Interest rate risk covers the risk of holding or taking positions in debt securities and other interest rate related instruments held in the trading book. This includes fixed and floating rate securities, as well as non-convertible preference shares. Convertible bonds are treated as debt securities if they behave like debt securities and as equities if they behave like equities<sup>1645</sup>. Traded mortgage securities and derivatives on mortgages are stated to possess unique characteristics because of the risk of prepayment by the mortgagor. No common treatment applies, and the capital charge is left to national supervisors to determine<sup>1646</sup>.
- 11.11.7 The capital charge is sub-divided into “specific risk” and “general market risk”. Specific risk is the idiosyncratic risk applicable to the issuer, whereas



general market risk is the risk of loss as a result of general changes in the interest rate (e.g. a shift in the Bank of England base rate or FedFunds rate).

11.11.8 The capital charge for specific risk on interest rate securities is set out in the following table<sup>1647</sup>:

Specific risk capital requirement for issuer risk		
Categories	External rating	Capital requirement
Government	AAA to AA-	0%
	A+ to BBB-	0.25% if residual maturity is six months or less 1% if the residual maturity is over six months and up to 24 months (2 years) 1.6% if residual maturity is greater than 24 months
	BB+ to B-	8%
	Below B-	12%
	Unrated	8%
Qualifying		0.25% if residual maturity is six months or less 1% if residual maturity is greater than six months and up to 24 months (2 years) 1.6% if residual maturity exceeds 24 months
Other	BB+ to BB-	8%
	Below BB-	12%
	Unrated	8%

11.11.9 If government paper is denominated in the domestic currency and funded by the bank in the same currency a lower risk weight may be applied<sup>1648</sup>.

11.11.10 Important is the definition of “qualifying” items as they benefit from a lower capital requirement. This class comprises:

- (a) securities issued by public sector entities and multi-lateral development banks that do not qualify for sovereign treatment under the credit risk framework;

- (b) other (corporate) securities rated investment grade by at least two credit rating agencies specified by the national authority;
- (c) other (corporate) securities rated investment grade by one credit rating agency and not less than investment grade by any other rating agency specified by the national authority; and
- (d) subject to supervisory approval, unrated securities deemed to be investment grade by the bank, provided the issuer has securities (debt or equity) listed on a recognised stock exchange<sup>1649</sup>. If the bank uses the IRB approach to credit risk, then the unrated securities must be treated as investment grade under the bank's approved credit risk model<sup>1650</sup>.

Securitisation positions held in the trading book attract a specific risk capital charge the same as banking book positions, as set out in chapter 7 on Securitisation<sup>1651</sup>.

- 11.11.11 Banks may limit the capital charge for securitisation positions and credit derivatives to the maximum potential loss<sup>1652</sup>.
- 11.11.12 There are specific rules relating to the treatment of hedges for specific risk<sup>1653</sup>, as well as nth-to-default credit derivatives<sup>1654</sup>, and for the securitisation correlation trading portfolio<sup>1655</sup>.
- 11.11.13 The capital charge for general market risk is “designed to capture the risk of loss arising from changes in market interest rates”<sup>1656</sup>. As under the Market Risk Amendment, two approaches are allowed: a maturity method or a duration method<sup>1657</sup>. In each method the capital requirement is the sum of four components:
  - (a) the net short or long position in the whole trading book;
  - (b) a small proportion of the matched positions in each time band;
  - (c) a larger proportion of the matched positions across different time bands; and
  - (d) a net charge for option positions<sup>1658</sup>.
- 11.11.14 Separate maturity ladders must be used for each currency with the capital charge calculated on a currency-by-currency basis, and then summed with no offsetting between long and short positions, with a possible different treatment for those currencies in which business is insignificant<sup>1659</sup>.
- 11.11.15 Under the maturity method, long or short positions in debt instruments (and derivatives) are slotted into 13 time bands (15 for low-coupon instruments). Fixed-rate instruments are slotted according to their residual maturity, and floating-rate instruments until the next repricing date<sup>1660</sup>. The first step in the calculation is to weigh the positions in each time band by a factor designed to reflect the price sensitivity of those positions to assumed changes in interest rates. The following table sets out the requirements<sup>1661</sup>:

Maturity method: time bands and weights			
Coupon 3% or more	Coupon less than 3%	Risk weight	Assumed change in yield
1 month or less	1 month or less	0%	1
1 to 3 months	1 to 3 months	0.2%	1
3 to 6 months	3 to 6 months	0.4%	1
6 to 12 months	6 to 12 months	0.7%	1
1 to 2 years	1 to 1.9 years	1.25%	0.9
2 to 3 years	1.9 to 2.8 years	1.75%	0.8
3 to 4 years	2.8 to 3.6 years	2.25%	0.75
4 to 5 years	3.6 to 4.3 years	2.75%	0.75
5 to 7 years	4.3 to 5.7 years	3.25%	0.7
7 to 10 years	5.7 to 7.3 years	3.75%	0.65
10 to 15 years	7.3 to 9.3 years	4.5%	0.6
15 to 20 years	9.3 to 10.6 years	5.25%	0.6
Over 20 years	10.6 to 12 years	6%	0.6
	12 to 20 years	8%	0.6
	Over 20 years	12.5%	0.6

11.11.16 The second step is to offset the weighted long and short positions in each time band, resulting in a single short or long position for each time band. However, as each time band includes different instruments and different maturities, a 10% capital requirement applies to the smaller of the long or short position, to reflect basis risk and gap risk. For example if the weighted long positions in a time band are \$100 million and the weighted short positions are \$90 million, then a capital charge of 10% of \$90 million applies, i.e. \$9 million<sup>1662</sup>.

11.11.17 The result of the above calculations is to produce two different sets of weighted positions: the net long or net short position in each time band *and* the additive capital charge based on the smaller of the net long or short position across all positions in that time band, as mentioned above<sup>1663</sup>. Once these calculations have been performed two further sets of off-setting are required:

- (a) between the net positions in each of three supervisory zones; and
- (b) then between the net positions in each zone<sup>1664</sup>.

11.11.18 The zones are designated as follows:

- (a) time bands on 0 to one year: Zone 1;
- (b) time bands of one to four years: Zone 2; and
- (c) time banks of four years or over: Zone 3<sup>1665</sup>.

11.11.19 A different calculation of the time bands applies for coupons of less than 3 years<sup>1666</sup>.

11.11.20 Matching takes place as follows: in the first instance between weighted long and short positions in each time band; and in the second, residual unmatched positions in one time band against positions in another time band. The rules are set out in the table below:

Offset between zones				
Zones	Time band	Within the zone	Between adjacent zones	Between zone 1 and 3
1	0 to 12 months	40%	40%	100%
2	1 to 5 years	30%	40%	100%
3	5 years plus	30%	40%	100%

11.11.21 The way this works is that matched positions within each zone are subject to the capital charge in the third column. Remaining unmatched positions that can be matched against an adjacent zone are subject to a 40% capital charge, and remaining positions that can be matched only against zones 1 and 3 are subject to a 100% capital charge. This is referred to in the Basel III text as a disallowance factor<sup>1667</sup>.

11.11.22 The alternative to the maturity-based method referred to above for calculating general interest rate risk is the duration-based approach. This is dependent on supervisory approval. This is considered a more accurate means of measuring market risk. The basis of the duration-based approach is as follows:

- banks must calculate the price sensitivity of each instrument in terms of a change of interest rates of between 0.6% and 1% depending on the maturity of the instrument;
- the resulting sensitivity measures are slotted into a duration-based ladder with 15 time bands;
- long and short positions in each time band are subject to a 5% disallowance factor (i.e. a capital charge); and
- the net positions are carried forward each time for horizontal offsetting<sup>1668</sup>.

Duration method: time bands and assumed change in yield	
Zone 1	
1 month or less	1
1 to 3 months	1
3 to 6 months	1
6 to 12 months	1

Duration method: time bands and assumed change in yield	
Zone 2	
1 to 1.9 years	0.9
1.9 to 2.8 years	0.8
2.8 to 3.6 years	0.75
Zone 3	
3.6 to 4.3 years	0.75
4.3 to 5.7 years	0.7
5.7 to 7.3 years	0.65
7.3 to 9.3 years	0.6
9.3 to 10.6 years	0.6
10.6 to 12 years	0.6
12 years to 20 years	0.6
Over 20 years	0.6

11.11.23 The capital charges for offsets across different zones are the same as for the maturity approach considered above<sup>1669</sup>.

11.11.24 The treatment of interest-rate derivatives is complex. Derivatives must be converted into positions in the underlying instrument and subject to specific and general interest rate risk<sup>1670</sup>. The amounts reported must be the principal amount of the underlying or notional underlying under the *Basel II* standard<sup>1671</sup>. Futures and forwards are treated as a combination of a long and a short position in a notional government security<sup>1672</sup>. Swaps are treated as two notional positions in government securities with relevant maturities. Thus a swap under which a bank receives floating rate interest payments is treated as having a long position in a floating rate instrument of a maturity until the next interest rate fixing period, and a short position in a fixed-rate instrument with a maturity equal to the residual maturity of the swap<sup>1673</sup>. Equity swaps are treated under the equity framework<sup>1674</sup>. Banks can exclude from the market risk framework identical long and short positions in the same instruments<sup>1675</sup>. This makes sense as there is no market risk on such positions. Certain other derivative positions may be treated as matched and fully offset<sup>1676</sup>. Alternative rules may apply to banks with large swap books<sup>1677</sup>, and certain swaps are not subject to a specific risk capital charge<sup>1678</sup>.

11.11.25 The treatment of interest-rate derivatives is summarised in the following table<sup>1679</sup>:

Interest rate derivatives			
Instrument		Specific risk charge	General interest rate market charge
Exchange-traded future	Government debt	Yes	Yes, as two positions

Interest rate derivatives			
Instrument		Specific risk charge	General interest rate market charge
	Corporate debt	Yes	Yes, as two positions
	Index on interest rates (e.g. LIBOR or RFR <sup>1680</sup> )	No	Yes, as two positions
OTC forwards	Government debt	Yes	Yes, as two positions
	Corporate debt	Yes	Yes, as two positions
	Index on interest rates	No	Yes, as two positions
FRAs and swaps		No	Yes, as two positions
Forward FX		No	Yes, as one position in each currency
Options	Government debt	Yes	Either (i) carve out or (ii) general interest risk charge under the delta-plus method with additional capital charges for gamma <sup>1681</sup> and vega risk
	Corporate debt	Yes	<i>ditto</i>
	Index on interest rates	No	<i>ditto</i>
	FRAs and swaps	No	<i>ditto</i>

11.11.26 The specific risk capital charge for government securities only applies where the securities are rated below AA-<sup>1682</sup>. No alternative framework exists for jurisdictions that do not allow the use of external ratings.

#### Equity risk

11.11.27 Equity risk covers the risk “of holding or taking positions in equities in the trading book. It applies to long and short positions in all instruments that exhibit market behaviour similar to equities, but not to non-convertible preference shares (which are covered by the interest rate risk requirements)”<sup>1683</sup>. Long and short positions in the same equity are netted<sup>1684</sup>.

11.11.28 As with interest rate risk, the capital charge is the aggregation of specific and general equity risk. Specific risk is “the bank’s gross equity positions (ie the

sum of all long equity positions and short equity positions”. General market risk is “the difference between the sum of the longs and the sum of the shorts (ie the overall net position in an equity market”. The long or short position is calculated on a market-by-market basis<sup>1685</sup>.

11.11.29 Unlike the position for interest rate risk, the capital charge for specific and general equity risk are both 8%<sup>1686</sup>. These are additive requirements.

11.11.30 For equity derivatives the following rules apply. Apart from options, equity derivatives and off-balance sheet positions affected by changes in equity prices are subject to these requirements, including swaps and futures<sup>1687</sup>. Derivatives are converted into notional equity positions. Futures and forwards are reported at current market prices. Future index positions are reported as the mark-to-market value of the notional underlying portfolio<sup>1688</sup>. Equity swaps are treated as two notional positions<sup>1689</sup>. Matched positions are disregarded<sup>1690</sup>.

11.11.31 The treatment of options is set out in the table below.

11.11.32 In addition to the capital treatment described above for general market risk (8%), a 2% additional capital requirement applies to the net long or short position in an index contract comprising a diversified portfolio of equities<sup>1691</sup>. Carve-outs apply to specified arbitrage strategies<sup>1692</sup>. In such cases the minimum capital requirement is 4% (i.e. 2% of the positions on each side) to reflect divergence and execution risks).

11.11.33 The capital treatment for equity derivatives is summarised below<sup>1693</sup>:

Treatment of equity derivatives			
Exchange-traded or OTC future		Specific risk	General market risk
	Individual equity	Yes	Yes, as underlying
	Index	2%	Yes, as underlying
Options	Individual equity	Yes	(a) carve out; or (b) general market risk charge based on the delta-plus method (with separate capital requirements for gamma and vega risk)
	Index	2%	<i>Ditto</i>

#### *Foreign exchange risk*

11.11.34 Under the simplified standardised approach gold is treated as a currency<sup>1694</sup> and not as a commodity, unlike elsewhere in the Basel III framework. This is a hold-over from the Basel II standard.

11.11.35 FX market risk is based on two processes:

- (a) measuring the exposure in a single currency position; and
- (b) measuring the risks inherent in a bank's mix of long and short positions in different currencies<sup>1695</sup>.

11.11.36 A bank's net open position in any given currency is the sum of: (1) the net spot position (all assets less liabilities); (2) the net forward position (i.e. all amounts to be received less amounts to be paid under forward FX transactions); (3) guarantees and similar instruments certain to be called and likely to be irrecoverable; (4) net future income/expenses not yet accrued but fully hedged; (5) any other item reporting a profit or loss in foreign currencies; and (6) the net delta-based equivalent of the total book of foreign currency options<sup>1696</sup>.

11.11.37 Banks that are not permitted to use an internal model by its supervisory authority must use a shorthand model that treats all currencies (including gold) equally<sup>1697</sup>. This involves converting each FX position at spot rates into the reporting currency<sup>1698</sup>. The overall position is calculated by aggregating (1) the greater of the sum of net short or long positions (without netting); and (2) the net position in gold<sup>1699</sup>.

11.11.38 The capital charge is 8% of the overall higher net position (long or short)<sup>1700</sup>.

#### *Commodities risk*

11.11.39 The commodity risk weight applies to "a physical product which is or can be traded on a secondary market e.g. agricultural products, minerals (including oil) and precious metals"<sup>1701</sup>. Unlike the rest of the Basel III framework gold is treated as a currency<sup>1702</sup>. The Committee observes that "[t]he price risk in commodities is often more complex and volatile than that associated with currencies and interest rates. Commodity markets may also be less liquid than those for interest rates and currencies and, as a result, changes in supply and demand can have a more dramatic effect on price and volatility"<sup>1703</sup>.

11.11.40 The Basel Committee identifies the following risks with commodity positions:

- (a) for spot or physical trading, the directional risk arising from the change in the spot price;
- (b) banks using portfolio strategies involving forward or derivative contracts may be exposed to additional risks including basis risk, interest rate risk and forward gap risk (the risk that prices may change for reasons other than a change in interest rates)<sup>1704</sup>; and
- (c) OTC counterparty credit risk is stated to be captured by Annex IV of *Basel II* (not described here)<sup>1705</sup>.

11.11.41 There are two separate ways of capturing commodities risk under the simplified standardised approach: (1) the maturity ladder approach and (2) the simplified approach. According to the Committee, "[b]oth the maturity ladder approach and the simplified approach are appropriate only for banks



that, in relative terms, conduct only a limited amount of commodities business<sup>1706</sup>. This seems inconsistent with the Basel Committee's statement that some non-G-SIBs may use the simplified market risk framework, and may be a holdover from the Basel II standard. In any case, as supervisors will decide whether a bank may use the simplified standardised approach they will be in a position to determine what a "limited amount" means in their jurisdiction.

- 11.11.42 Under both the maturity ladder and simplified approaches, long and short positions in each commodity may be reported on a net basis to calculate open positions<sup>1707</sup>. Positions in different commodities are generally not off-settable, although national supervisors may allow netting against different sub-categories of the same commodity deliverable against each other, or as close substitutes, subject to national approval and meeting a quantitative 0.9 correlation<sup>1708</sup>.
- 11.11.43 Under the maturity ladder approach banks are required to express each commodity position in the standard unit of measurement, converting the net position into the notional (assumed, the reporting) currency at the spot rate<sup>1709</sup>. To capture forward gap and interest rate risk within a time band, matched short and long positions in each time band carry a capital requirement. Positions in separate commodities are first entered into a maturity ladder, while physical stocks are allocated to the first time band. A separate maturity ladder is used for each commodity, and for each time band the sum of long and short positions that are matched are multiplied first by the spot price for the commodity, and then by a spread of 1.5%<sup>1710</sup>. A table in MAR 40.69 sets out the 1.5% spread rate for all maturities<sup>1711</sup> determining the relevant time bands.
- 11.11.44 The residual net positions from "nearer" time bands are carried forward to off-set exposures in time bands that are further out, with a surcharge of 0.6% of the net position carried forward in respect of each time band than the net position carried forward. The capital requirement for matched amounts by carrying forward net positions is 1.5%. For unmatched positions, the capital charge is 15%<sup>1712</sup>. Specified rules apply to commodity derivatives<sup>1713</sup>.
- 11.11.45 The alternative to the maturity ladder is the simplified approach. "In calculating the capital requirement for directional risk under the simplified approach, the same procedure will be adopted as in the maturity ladder approach described above ... Once again all commodity derivatives and off-balance sheet positions that are affected by changes in commodity prices should be included. The capital requirement will equal 15% of the net position, long or short, in each commodity"<sup>1714</sup>. To protect the bank from basis risk, interest rate risk and forward gap risk, the capital requirement for each commodity is subject to an additional (additive) capital requirement of 3% of the bank's gross positions, long plus short, in each particular commodity. Derivatives are included at the current spot price<sup>1715</sup>.

### *Options*

- 11.11.46 Two alternative approaches are permitted at national discretion:

- (a) banks that only purchase options may use the simplified approach (described below, and distinct from other simplified approaches); but
- (b) banks that write options must use the delta-plus method *or* the scenario approach. The more significant a bank's trading activity is "the more the bank will be expected to use a sophisticated approach, and a bank with highly significant trading activity is expected to use the standardised approach or the internal models approach"<sup>1716</sup>.

#### *Simplified methodology for options*

11.11.47 Banks "that handle a limited range of purchased options can use the simplified approach ... for particular trades"<sup>1717</sup>. In the simplified approach to options, the positions for the options, and the associated cash, underlying or forward are subject to capital requirements that incorporate both specific risk and general market risk. The risk numbers are added to the category e.g. interest rate risk, equity risk, FX risk, etc. This is set out in the table below<sup>1718</sup>:

Capital requirements under the simplified approach	
Position	Treatment
Long cash and long put or Short cash and long call	The capital requirement is the market value of the underlying security multiplied by the sum, of specific and general market risk charges for the underlying less the amount the option is in the money (if at all)
Long call or long put	The lesser of: (1) the market value of the underlying security multiplied by the sum of specific and general market risk charges for the underlying; and (2) the market value of the option.

#### *The delta-plus method for options*

11.11.48 This is the primary method under the simplified standardised approach. "The delta-plus method uses the sensitivity parameters of Greek letters associated with options to measure their market risk and capital requirements. Under this method, the delta-equivalent position of each option becomes part of the simplified standardised approach ... Separate capital requirements are then applied to the gamma and vega risk of the option positions. The scenario approach uses simulation techniques to calculate changes in the level and volatility of its associated underlyings. Under this approach, the general market risk charge is determined by the scenario grid (ie the specified combination of underlying and volatility changes) that produce the largest loss. For the delta-plus method and the scenario approach, the specific risk capital requirements are determined separately by multiplying the delta-equivalent of each option by the specific risk weights"<sup>1719</sup>.

11.11.49 Banks that write options are allowed to include delta-weighted options within the simplified standardised approach. Such options must be reported as a

position equal to the market value of the underlying multiplied by the delta. However, as delta is regarded as insufficient to capture the risks arising from options, the simplified standardised approach requires calculation of gamma and vega risk. Gamma risk measures the rate of change in delta, while vega risk measures the sensitivity in the value of an option to a change in volatility<sup>1720</sup>. These sensitivities are calculated according to a bank's approved exchange model, or proprietary options pricing model, subject to oversight by the relevant national supervisor<sup>1721</sup>.

11.11.50 Delta-weighted positions are slotted into the interest rate time bands considered earlier. A two-legged approach applies, with one leg based on the time the underlying contract takes effect and a second based on the derivative's maturity. An example given by the Basel Committee is of a bought call option in April on a June three month interest rate future which must be treated as a long position with a five month maturity and a short position with a two month maturity. Further examples are provided of floating rate instruments with caps or floors<sup>1722</sup>.

11.11.51 The capital treatment of options with equities as the underlying is also based on the delta-weighted position. The treatment of options on commodities is based on the simplified or maturity ladder approach has been discussed above.

#### *Gamma and vega risk*

11.11.52 The need to calculate capital charges for these risks has been mentioned above in the context of options under the delta-plus method.

11.11.53 Gamma risk is calculated as one half of the gamma risk multiplied by the squared value of VU. VU is determined based on the type of option and varies from 0% to 15% depending on the underlying<sup>1723</sup>. Vega risk (unlike under the sensitivities-based approach) is based on the sum of all vega risks for all options based on the same underlying multiplied by a proportional shift in volatility of +/- 25%<sup>1724</sup>. The total capital requirement for vega risk is the sum of the absolute value of all individual capital requirements for vega risk<sup>1725</sup>.

#### *Scenario approach*

11.11.54 According to the Basel Committee, "[m]ore sophisticated banks may opt to base the market risk capital requirement for options portfolios and associated hedging positions on scenario matrix analysis. This will be accomplished by specifying a fixed range of changes in the option portfolio's risk factors and calculating changes in the value of the option portfolio at various points along this grid. For the purpose of calculating the capital requirement, the bank will revalue the option portfolio using matrices for simultaneous changes in the option's underlying rate or price and in the volatility of that rate or price. A different matrix is set up for each individual underlying"<sup>1726</sup>. As an alternative, at the discretion of the national supervisor, banks that are significant traders in options are, for interest rate options, permitted to base the calculation based on a minimum of six time bands. Limitations on time bands apply<sup>1727</sup>. Under the scenario approach banks must use the highest of the assumed changes in yield applicable to the time band. For other portfolios

an 8% figure (plus or minus) applies to equities, gold, foreign exchange and 15% for commodities<sup>1728</sup>.

- 11.11.55 Under the scenario approach there is a second dimension based on a change in the volatility of the underlying rate or price. The Committee states that a single change in the volatility of the underlying rate or price equal to a shift of volatility of plus or minus 25% “is expected to be sufficient in most cases”<sup>1729</sup>.
- 11.11.56 After calculating the matrix, each cell contains the profit or loss of the option, and any underlying hedge instrument. The capital requirement is the largest loss contained in the matrix<sup>1730</sup>. After calculating the matrix, the capital requirement is the largest loss in the matrix<sup>1731</sup>.
- 11.11.57 In the final 2019 standard the Basel Committee states that other risks associated with options including rho (the rate of change of the value of the option with respect to interest rates) and theta (the rate of change of the value of the option with respect to time) are also relevant: “While not proposing a measurement system for those risks at present, it [the Committee] expects banks undertaking significant options business at the very least to monitor such risks closely. Additionally, banks will be permitted to incorporate rho into their capital calculations for interest rate risk, if they wish to do so”<sup>1732</sup>. Whether this exhortation will be heeded, given the alternatives of the sensitivities-based approach and the internal models-based approach discussed earlier in this chapter is unclear.

## 12. CREDIT VALUATION ADJUSTMENT

### 12.1 Introduction

12.1.1 A credit valuation adjustment is a change in the market value of derivative instruments to take account of credit risk. It therefore represents the discount in the market value of a derivative to take account of the possibility of the default of the counterparty. It is similar to counterparty credit risk, but was excluded from CCR, as it is not a pure credit risk but is a function of the effect of the risk of default on market prices. It therefore has more in common with market risk, but is treated separately in the Basel framework from the market risks discussed in the preceding chapter, as it has its own specific treatment that differs from that for market risk. According to Akkizidis and Kalyvas <sup>1733</sup> “[t]he CVA analysis is a critical element in pricing over-the-counter (OTC) derivatives. Since the changes in CVA are due to the market pricing of counterparty risk, the variability of the counterparty risk over time could be potentially far more significant than the credit risk of the underlying position. Hence, the fair value of a financial derivative depends on the counterparty credit risk ... of the traded derivative”<sup>1734</sup>.

12.1.2 In its 2015 Review of the Credit Valuation Adjustment Risk Framework <sup>1735</sup>, the Basel Committee defined CVA as:

“an adjustment to the fair value (or price) of derivative instruments to account for counterparty credit risk (CCR). Thus, CVA is commonly viewed as the price of CCR. This price depends on counterparty credit spreads as well as on the market risk factors that drive derivatives’ values and, therefore, exposure. The purpose of the Basel III CVA capital charge is to capitalise the risk of future changes in CVA”<sup>1736</sup>.

12.1.3 The Committee explained:

“During the financial crisis, banks suffered significant counterparty credit risk (CCR) losses on their OTC derivatives portfolios. The majority of these losses came not from counterparty defaults but from fair value adjustments on derivatives. The value of outstanding derivative assets was written down as it became apparent that counterparties were less likely than expected to meet their obligations”<sup>1737</sup>.

12.1.4 As a result, Basel 2.5 adopted an express CVA capital charge:

“The current CVA framework sets forth two approaches for calculating the CVA capital charge, namely the ‘Advanced CVA risk capital charge’ method (the current Advanced Approach) and the ‘Standardised CVA risk capital charge’ method (the current Standardised Approach). Both approaches aim at capturing the variability of regulatory CVA that arises solely due to changes in credit spreads without taking into account exposure variability driven by daily changes of market risk factors”<sup>1738</sup>.

- 12.1.5 The 2015 review identified two major deficiencies with the Basel 2.5 approach:
- (a) a failure to capture all CVA risks i.e. CVA sensitivity to variability in underlying market risk factors; and
  - (b) the Basel 2.5 framework does not cover the exposure component of CVA risk, and, consequently, does not recognise the hedges that banks put in place to target the exposure component of CVA variability<sup>1739</sup>.
- 12.1.6 Additionally, the Committee sought to align the CVA capital charge with existing accounting practices and the Basel III framework for market risk.
- 12.1.7 Accordingly, the two Basel 2.5 approaches are withdrawn and two new approaches are introduced. These are:
- (a) the basic approach (BA-CVA); and
  - (b) the standardised approach (SA-CVA)<sup>1740</sup>.
- 12.1.8 Unlike other elements of the Basel III framework, banks require supervisory approval to use the standardised approach. If this is not forthcoming, then banks must use the basic approach<sup>1741</sup>. No internal model approach is permitted for CVA. For this reason we will describe first the basic approach before proceeding to consider the standardised approach.
- 12.1.9 The regulatory CVA treatment is intended to be aligned with accounting standards, but may differ because:
- (a) regulatory CVA excludes the effect of a bank's own default. This is an obvious prudential adjustment as a bank that is more likely to fail should not be able to reduce its capital requirements as a result; and
  - (b) several aspects of best practice in accounting standards are expressly incorporated into the regulatory CVA<sup>1742</sup>.
- 12.1.10 CVA is defined in the Basel III standard as:
- “the adjustment of default risk-free prices of derivatives and securities financing transactions (SFTs) due to a potential default of the counterparty”<sup>1743</sup>.
- 12.1.11 As with the market risk capital charge, and for the same reason, the risk-weighted assets for CVA are multiplied by 12.5<sup>1744</sup>.

#### *Scope of the CVA Charge*

- 12.1.12 CVA must be calculated for all instruments within scope (i.e. derivatives and repo-style transactions) across both the banking and trading book. This is another reason for treating it as a market risk. The following exceptions from the CVA capital charge apply:

- (a) all derivatives transacted directly with a “qualifying” central counterparty;
- (b) derivatives giving rise to a central counterparty exposure where the bank is a client of a clearing member that meet specified criteria (the most important being the bank has no exposure to the default of its clearing member); and
- (c) securities financing transactions (SFTs) fair-valued by a bank for accounting purposes where the supervisor is satisfied that the bank’s CVA loss exposures are “immaterial”. The bank must justify the assessment with relevant documentation<sup>1745</sup>.

12.1.13 Capital requirements apply to the totality of the CVA portfolio on covered transactions across its entire portfolio (including eligible hedges). It is therefore an additional capital charge<sup>1746</sup>.

12.1.14 There is a carve-out for banks below a “materiality” threshold. Any bank whose aggregate notional amount of non-centrally cleared derivatives is less than or equal to €100 billion may elect not to use the BA-CVA or SA-CVA methods “and instead choose an alternative treatment”<sup>1747</sup>. This is to set its CVA capital requirement at 100% of the bank’s capital requirement for counterparty credit risk (CCR). Under this approach, hedges are not recognised, and the treatment must be applied to the entire portfolio (i.e. banks cannot mix and match between this approach and the other approaches for different sub-portfolios). The national supervisor may also revoke this option “if it determines that CVA risk resulting from the bank’s derivative positions materially contributes to the bank’s overall risk”<sup>1748</sup>.

## 12.2 Hedging

12.2.1 Hedging benefits may be recognised under both the basic and standardised approaches, although this varies between the approaches.

12.2.2 Hedging instruments may be either external (i.e. with an external counterparty) or internal (with one of the bank’s trading desks)<sup>1749</sup>.

12.2.3 All external hedges (including both eligible and ineligible CVA hedges) must be included in the CVA calculation of the counterparty providing the hedge.

12.2.4 All eligible external CVA hedges are excluded from the market risk capital charge described in the previous chapter.

12.2.5 Ineligible external CVA hedges are instead treated as trading book instruments and subject to the relevant treatment for market risk and not CVA.

12.2.6 Internal hedges are only recognised under the CVA framework if they involve two perfectly offsetting positions: one on the CVA desk and another on the trading desk. If such an internal hedge is ineligible then both positions are allocated to the trading book where (being perfectly matched) they offset each other leading to no impact on either the CVA portfolio or the trading book.

- 12.2.7 If the CVA hedge is eligible then the CVA desk position forms part of the CVA portfolio and is capitalised as described in this chapter. The trading desk position, is instead capitalised under the applicable trading book treatment for market risk.
- 12.2.8 If an internal CVA hedge involves an instrument that is subject to either curvature risk, default risk or the residual add-on (e.g. instruments with optionality, or exotic options) then it is only eligible as an internal hedge if the trading desk that is the CVA desk's internal counterparty executes a transaction with an external counterparty that exactly offsets the trading desk position with the CVA desk i.e. the risk must be transferred to an external third party<sup>1750</sup>.

### 12.3 Banks using the IRB Approaches for Credit Risk

- 12.3.1 Banks using either the basic or standardised approach to CVA risk may cap the maturity factor (a scalar) at 1 for all netting sets contributing to a CVA capital charge when they calculate their CCR capital charge under the internal ratings-based approach<sup>1751</sup>.

### 12.4 The Basic Approach to CVA

- 12.4.1 This is the default approach for banks that do not have supervisory permission to use the standardised approach. There are two sub-approaches: the full approach and the reduced approach. Banks can choose which to apply, although the full approach is intended for banks that hedge CVA risk, while the reduced approach is intended to simplify the calculation for banks that do not hedge CVA risk<sup>1752</sup>. Hedges are simply not recognised under the reduced version. All banks that use the full version must, in addition, calculate the reduced version disregarding any hedges<sup>1753</sup>.
- 12.4.2 Akkizidis and Kalyvas summarise the basic approach as follows:

“In both reduced and the full version of BA-CVA approaches, the RWs assigned to the exposures are based on the classification of the counterparty sector and credit quality. In the reduced BA-CVA the bank has to compute the stand-alone CVA capital. The capital charge resulting from the reduced BA-CVA is also included in the capital charge for the full BA-CVA. The latter also comprises systematic and idiosyncratic components and the quantity ... reflecting the indirect hedges that are not fully aligned with counterparties' credit spreads”<sup>1754</sup>.

#### *The reduced version*

- 12.4.3 The reduced version is based on a square root calculation aggregating two elements. The first element aggregates the systemic components of CVA risk and the second element the idiosyncratic components of CVA risk. Both elements in the formula are derived from the CVA capital requirement that each counterparty of the bank would receive if considered on a stand-alone basis multiplied by specified supervisory correlation factors. The purpose of



these factors recognises that the actual CVA risk faced by a bank is less than the sum of each stand-alone CVA factor<sup>1755</sup>.

- 12.4.4 The stand-alone calculation for CVA risk for each counterparty is calculated across each netting set with that individual counterparty. It is based on a number of components, although the formula will be omitted here. Relevant factors are the volatility of the credit spread of the counterparty, the effective maturity of each netting set, the exposure at default (calculated in the same way as for counterparty credit risk) and two supervisory factors (a supervisory discount factor and a multiplier to convert effective expected positive exposure into exposure at default)<sup>1756</sup>. The volatility of the credit spread is calculated based on a supervisory table depending on the sector of the counterparty, whether the obligor is investment grade, high yield or not rated<sup>1757</sup>.

#### *The full version*

- 12.4.5 As mentioned above, the full version allows recognition of hedges. Only transactions used for the purposes of mitigating the counterparty credit spread component of CVA risk, and managed as such, are eligible hedges<sup>1758</sup>. The only CVA hedges that are recognised are: single-name CDS, single-name contingent CDS and index CDS<sup>1759</sup>. A single-name CDS must either: (1) reference the counterparty directly, (2) reference an entity legally related to the entity (i.e. a member of its corporate group); or (3) reference an entity that belongs to the same sector and region as the counterparty<sup>1760</sup>. The concept of “single-name” is therefore quite wide.
- 12.4.6 All banks that use the full version must also calculate the reduced version as well<sup>1761</sup>.
- 12.4.7 Recognition of eligible hedges is based on the following elements:
- (a) the stand-alone and the correlation parameter are defined in exactly the same way as above for the reduced version;
  - (b) a quantity that gives recognition to single-name hedges of credit spread risk;
  - (c) a quantity giving recognition to the reduction of CVA risk across all counterparties from the use of index hedges; and
  - (d) a quantity characterising hedge misalignment, designed to limit the extent to which indirect hedges can reduce capital requirements given that they will not fully offset movements in a counterparty’s credit spread<sup>1762</sup>.
- 12.4.8 The latter is determined in accordance with a formula with three main terms: (1) the systematic components of CVA risk arising from the bank’s counterparties, single name hedges and index hedges; (2) the idiosyncratic components of CVA risk arising from the bank’s counterparties and the single-named hedges; and (3) the aggregation of the components of indirect hedges that are not aligned with counterparties’ credit spreads<sup>1763</sup>.

## 12.5 The Standardised Approach for CVA

12.5.1 As mentioned above, supervisory consent is required to use this calculation. It is an adaptation of the standardised approach for market risk (with different parameters). The main differences are as follows:

- (a) there is a reduced granularity of market risk factors; and
- (b) default risk and curvature risk are ignored<sup>1764</sup>.

12.5.2 Akkizidis and Kalyvas summarise the approach in the following words:

“The SA uses the sensitivities-based method aligned with the FRTB framework of the trading book. However, SA-CVA reduces the granularity of risk factors and the complexity of the related methods used in sensitivity analysis, the estimation of the SA-CVA capital charges relies on a given set of formulae and estimated sensitivities provided by the new framework. Under the new CVA banks estimate the sensitivity to each risk factor of the aggregate CVA and of the market value of all eligible hedging instruments in the CVA portfolio”<sup>1765</sup>.

12.5.3 They add that the exclusion from the SC-CVA standardised approach of default risk and a less demanding set of risk factors, compared with the standardised approach to market risk “may explain why risk aggregation under the SA-CVA is more conservative than under the [market risk] framework. Hence, the SA-CVA framework does not recognise any diversification effects between delta and vega risks nor any potential perfect correlation between CVA risks and their corresponding hedges. For each risk factor, the proposed framework does not allow any correlation between the CVA exposures and hedges, if the exposures are not perfectly hedged. The fact that correlations of imperfect hedges are not eligible impacts the diversification and results in higher capital requirements”<sup>1766</sup>.

12.5.4 Banks are required to calculate capital requirements and report them to supervisors at the same frequency as the market risk standardised approach figures. In addition, banks must be able to produce the standardised approach capital calculation at the request of supervisors<sup>1767</sup>.

12.5.5 The standardised approach uses as inputs the sensitivities of regulatory CVA to counterparty credit spreads and market risk factors driving the value of covered transactions<sup>1768</sup>. The following minimum criteria apply to use of the standardised approach:

- (a) the bank must be able to model exposure and calculate, at least on a monthly basis, CVA and CVA sensitivities to specified market risk factors; and
- (b) the bank must have a CVA desk or similar dedicated function responsible for risk management and hedging.

12.5.6 The bank must calculate regulatory CVA for each of its counterparties with which it has a position relevant to the CVA calculation<sup>1769</sup>. The following principles (amongst others) must be adhered to:

- (a) regulatory CVA is the expectation of future losses resulting from the default of the counterparty assuming the bank has no default risk;
- (b) the calculation is based on: (1) the term structure of market-implied probability of default (PD); (2) market-consensus expected loss given default (ELGD); and (3) simulated paths of discounted future exposure;
- (c) the term structure of market-implied PD is estimated from credit spreads observed in the market, or proxies where there is not actively traded credit;
- (d) the ELGD has to be the same as the one used to calculate risk-neutral PDs from credit spreads;
- (e) the simulated paths of discounted future exposure are derived by pricing all derivative transactions with the counterparty along simulated paths of relevant risk factors, and discounting prices by the risk-free interest rate;
- (f) all market risk factors material for transactions with a counterparty must be simulated as stochastic processes<sup>1770</sup> for an appropriate number of paths;
- (g) dependence between transactions must be taken into account where a significant level of dependence exists between exposures and the counterparty's credit quality; and
- (h) specific rules apply for margined transactions<sup>1771</sup>.

12.5.7 The following qualitative requirements also apply:

- (a) the bank must have a CVA risk management framework that includes the identification, measurement, management, approval and internal reporting of CVA risk;
- (b) senior management must be actively involved in the risk control process and regard CVA risk as an essential aspect of the business;
- (c) the bank has a process for ensuring compliance with a documented set of internal policies, controls and procedures;
- (d) there is an independent control unit at the bank responsible for effective initial and on-going validation of exposure models;
- (e) documentation requirements are met;
- (f) pricing models must be tested against appropriate independent benchmarks for a wide range of market states;
- (g) an independent review of the overall CVA management process should be carried out regularly by internal audit; and

- (h) data integrity standards are adhered to.<sup>1772</sup>

*Hedging under the standardised approach*

12.5.8 Only whole transactions that are used to mitigate CVA risk are eligible. A hedge cannot be split into different risks<sup>1773</sup>. Eligible hedges can include:

- (a) instruments hedging the variability of the counterparty's credit spread; and
- (b) instruments that hedge the variability of the exposure component of CVA risk<sup>1774</sup>.

12.5.9 Hedges excluded from the internal models-based approach to market risk (e.g. tranching credit derivatives) are ineligible<sup>1775</sup>.

*Capital calculation*

12.5.10 The standardised approach capital calculation for CVA is the sum of the capital requirements for delta and vega risk across the entire CVA portfolio, including eligible hedges<sup>1776</sup>. This may be scaled up by national supervisors "if the supervisor determines that the bank's CVA model warrants it (eg if the level of model risk for the calculation of CVA sensitivities is too high or the dependence between the bank's exposure to a counterparty and the counterparty's credit quality is not appropriately taken into account in its CVA calculations)"<sup>1777</sup>.

12.5.11 The capital calculation for delta risk is the sum of the delta capital requirement for the following risk classes:

- (a) interest rate risk;
- (b) foreign exchange (FX) risk;
- (c) counterparty credit spread risk;
- (d) reference credit spread risk (credit spreads that drive the CVS exposure component);
- (e) equity risk; and
- (f) commodity risk<sup>1778</sup>.

12.5.12 The capital requirement for vega risk is the sum of the vega capital requirement for the following risk classes:

- (a) interest rate risk;
- (b) foreign exchange (FX) risk;
- (c) reference credit spread risk;

- (d) equity risk; and
- (e) commodity risk<sup>1779</sup>.

- 12.5.13 Counterparty credit spread risk is not relevant to the vega risk calculation.
- 12.5.14 Unlike under the market risk standardised approach, “CVA sensitivities for vega risk are always material and must be calculated regardless of whether or not the portfolio includes options”<sup>1780</sup>. In calculating vega risk the model must include both (1) volatilities used for generating risk factor paths and (2) volatilities using for pricing options<sup>1781</sup>.
- 12.5.15 For each risk class subject to a delta or vega capital charge the sensitivity of the aggregate CVA and the sensitivity of all hedging instruments must be calculated<sup>1782</sup>.
- 12.5.16 The weighted sensitivities are then aggregated into a capital requirement within each bucket specified in the Basel III text, including a hedging disallowance factor to prevent recognition of perfect hedging. Bucket-level capital requirements are then aggregated across buckets within each risk class. The correlation parameters are also specified in the Basel III text, and differ from those applicable under the standardised approach to market risk<sup>1783</sup>. The remainder of the text of MAR 50 sets out the supervisory risk buckets, sensitivities, risk weights and correlations. As these vary between delta risk and vega risk, and across the defined risk factors, it would not be helpful to set them out here and the reader is referred to the Basel III text<sup>1784</sup>.

## 13. OPERATIONAL RISK

### 13.1 Introduction

13.1.1 Basel II supplemented the capital frameworks for credit and market risks with a bespoke and additional capital charge for operational risk. This is intended to address other risks that banks are exposed to, such as internal fraud, external fraud, rogue traders, legal risk (e.g. ineffective documentation), regulatory fines resulting from compliance failures, etc. All of these are potential significant sources of risk for a bank but are not in any real sense a *credit* risk or a *market* risk. Ineffective legal documentation may cause credit or market risk losses, but it is not the intention of those frameworks to address such risks. Basel II included three approaches of graduated complexity which a bank might use: the basic indicator approach, the standardised approach and advanced measurement approaches, based on internal models using past operational loss data. All three approaches are withdrawn by Basel III and will not be considered further. Instead, only one new approach is permitted, described as the standardised approach. According to Pattwell et al, the new approach “can result in significant differences for banks”<sup>1785</sup> that apply one of the existing three approaches under Basel II.

### 13.2 Definition

13.2.1 Operational risk is defined as “the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputational risk”<sup>1786</sup>. Strategic risk is presumably the risk of losses caused by bad strategic decisions by the business. Reputational risk is the risk a bank may suffer future losses from events that adversely affect its reputation. Such risks are not quantifiable and their incidence is unknowable.

13.2.2 A footnote adds that “[l]egal risk includes, but is not limited to, exposure to fines, penalties, or punitive damages resulting from supervisory actions, as well as private settlements”<sup>1787</sup>.

### 13.3 The Standardised Approach

13.3.1 The standardised approach is based on three figures determined by the Basel Committee:

- (a) the business indicator (BI), which is a financial statement-based proxy for operational risk;
- (b) the business indicator component (BIC), which is calculated by multiplying the BI by a set of regulatory coefficients ( $\alpha_i$ ); and
- (c) the internal loss multiplier (ILM), which is a scaling factor that is based on a bank’s average historical losses and the BIC<sup>1788</sup>.

- 13.3.2 The operational risk capital requirement (ORC) is generated by multiplying the BIC by the ILM:

$$\text{ORC} = \text{BIC} \times \text{ILM}^{1789}.$$

- 13.3.3 The risk-weighted assets calculation for operational risk is the ORC multiplied by 12.5<sup>1790</sup>.
- 13.3.4 The business indicator (BI) is composed of three components: (1) the interest, leases and dividend component (ILDC); (2) the services component (SC); and the financial component (FC).

The definitions of these components will now be given.

#### *Business indicators*

- 13.3.5 The new standardised approach is derived from a series of business indicator components, which are then broken down into more granular income statement or balance sheet items. For each of these, the Basel III text provides a description (which is intended to serve as a definition) and then typical examples. We will summarise the components and income statement/balance sheet items, as these are used to generate the overall capital charges. For the full definitions of the latter and the examples given the reader is referred to the Basel III text.
- 13.3.6 The interest, lease and dividend component is broken down into the following items:
- (a) interest income from all financial assets and other interest income, including leases (interest income);
  - (b) interest expenses from all financial liabilities and other interest expenses, including leases (interest expenses);
  - (c) total gross outstanding loans, advances, interest bearing securities, including bonds (interest earning assets); and
  - (d) dividend income from investments in stocks<sup>1791</sup> and funds not consolidated in the bank's financial statements, including non-consolidated subsidiaries and other entities<sup>1792</sup> (dividend income).
- 13.3.7 The services component consists of the following:
- (a) income received from providing advice and services, including outsourcing income (fee and commission income);
  - (b) expenses paid for receiving advice and services, including outsourcing fees paid for financial services (fee and commission expenses);
  - (c) income from ordinary banking operations not included elsewhere, except operating leases (other operating income); and

(d) expenses and losses from ordinary banking operations not included elsewhere, except operating leases (other operating expenses).

13.3.8 The financial component has comprises the following items:

(a) the net profit or loss on the banking book; and

(b) the net profit or loss on the trading book.

13.3.9 The following 11 items are expressly excluded from any business indicator component or sub-component:

(a) income and expenses from any insurance or reinsurance businesses<sup>1793</sup>;

(b) premiums paid and payments made on insurance or reinsurance policies;

(c) administrative expenses e.g. staff salaries, IT costs, travel, office supplies, etc.;

(d) the recovery of administrative expenses;

(e) costs attributable to premises and fixed assets;

(f) depreciation or amortisation of tangible and intangible assets;

(g) provisions, except in relation to operational risk events;

(h) repayment of share capital payable on demand;

(i) impairments of financial and non-financial assets;

(j) changes in goodwill recognised in the profit and loss account; and

(k) corporation tax<sup>1794</sup>.

13.3.10 All of these items are either ordinary expenses of running the business or accounting adjustments that are not driven by the occurrence of operational loss events.

*Calculation of the business indicator figures for inclusion in the standardised approach*

13.3.11 At the consolidated level all business indicator figures must be effected on a fully consolidated basis, ignoring all intra-group income and expenses. Where calculated at a sub-consolidated basis, then it is at that level that the figures must be calculated<sup>1795</sup>. In certain circumstances, where banks are calculating business indicators on a sub-consolidated basis, and specified loss and other criteria are met, the banks are required to use loss experience in the calculation<sup>1796</sup>.

*Calculating the business indicator (BI)*

13.3.12 As has been seen there are three components. The BI is the sum of the interest, leases and dividend component (ILDC), the services component (SC) and the financial component (FC)<sup>1797</sup>.



$$BI = ILDC + SC + FC$$

- 13.3.13 Each of ILDC, SC and FC are determined by a simple formula. These are given below. Where there is a bar over any part of any formula the figure must be calculated separately over a three year period<sup>1798</sup>.

$$ILDC = \min(\overline{Abs(interest\ income - interest\ expense)}, 2.25\% \times \overline{interest\ earning\ assets}) + \overline{dividend\ income}$$

- 13.3.14 The ILDC therefore has two elements. The first depends on net interest and interest earning assets. The second refers only to dividend income. Specifically the first part of the calculation is derived by determining the lesser of (1) the absolute value of interest income less expenses (i.e. negative figures are treated as positive, so if expenses exceed income the figure for net expenses is treated as the figure with a positive sign) and (2) interest earning assets multiplied by 2.25%. The second part of the equation is simply the total dividend income of the bank. The ILDC is the sum of these two parts (using an average over three years where indicated).

$$SC = \max(\overline{other\ operating\ income}, \overline{other\ operating\ expense}) + \max(\overline{fee\ income}, \overline{fee\ expense})$$

- 13.3.15 The SC has two components. The first is simply the greater of other operating income and other operating expenses. There is no netting, and only the larger figure applies. The second is the greater of fee income and fee expenses. The SC is simply the sum of these maxima.

$$FC = \overline{Abs(Net\ P\ \&L\ trading\ book)} + \overline{Abs(Net\ P\ \&L\ banking\ book)}$$

- 13.3.16 The FC is likewise the sum of two components. The first is the absolute value of the trading book profit and loss account for the trading book. The second is the absolute value of the profit and loss account for the banking book. The two figures are added. The use of absolute values mean that the larger of the average profit or loss over three years is used as a number with a positive sign.

#### Calculating the BIC

- 13.3.17 The next step in determining the capital charge for operational risk is to calculate the business indicator component (BIC). This is done by multiplying the BI by a coefficient ( $\alpha_i$ ) set out in the table below. As is apparent the calculation increases as the BI increases i.e. the greater the BI the higher the figure. The table sets out three thresholds, and the nominal amount of the BI that falls within each of the three thresholds is multiplied by the relevant coefficient. These operate in the same way as tax thresholds, so you do not just look at the overall BI and apply the number in the table but must separate it into up to three numbers corresponding to the threshold. If the BI falls between the thresholds for bucket 2 then only the value of the BI within that threshold attracts the 15% multiplication factor. The marginal increase in the BIC resulting from a one unit increase in the BI is 12% in bucket 1, 15% in bucket 2 and 18% in bucket 3<sup>1799</sup>.

BI threshold and coefficient		
Bucket	Range (in € billion)	$\alpha_i$
1	less than or equal to 1	12%
2	greater than 1 but less than or equal to 30	15%
3	greater than 30	18%

13.3.18 An example given by the Committee is if the BI = €35 billion, then the BIC =  $(1 \times 12\%) + (30-1) \times 15\% + (35-30) \times 18\% = € 5.37 \text{ billion}^{1800}$ .

13.3.19 Presumably, the reference to the euro is indicative, and if a bank's reporting currency for capital adequacy purposes is sterling or the US dollar there is no need to convert this into euro at the spot rate on the day the calculation is made.

#### *The internal loss multiplier (ILM)*

13.3.20 This is the second element, together with the BIC, used to calculate the ORC. Its purpose is to take into account a bank's internal experience of operational losses. There is a national discretion to set the value of ILM to 1 for all banks in a supervisor's jurisdiction. In this case the operational risk capital requirement (ORC) is equal to the BIC determined as above. Further, for banks with a BI less than or equal to € 1 billion internal loss data do not affect the capital calculation, so the only factor is the BIC, which is 12% of the BI<sup>1801</sup>. The reason is that the ILM is equal to 1<sup>1802</sup>. However, national supervisors may allow banks to take into account internal loss data at national discretion<sup>1803</sup>.

13.3.21 The following formula applies<sup>1804</sup>:

$$ILM = \ln \left( \exp(1) - 1 + \frac{LC^{0.8}}{BC} \right)$$

The loss component (LC) in the formula is defined as 15 times the average annual operational risk losses the bank has incurred over the past 10 years.

ln in mathematics means the natural logarithm of a defined number, which is the logarithm of a mathematical constant e. For any given number ln grows more slowly to positive infinity as the number of losses increases. This means that as the number increases ln will increase but at a diminishing rate for any given increase in the number.

exp in mathematics means exponential i.e. to the power of. So exp(10) is the same as  $10^{10}$ . It is used here to make the formula easier to write.

13.3.22 The Basel Committee explains as follows:

“The ILM is equal to one where the loss and business indicator components [i.e. LC and BIC] are equal. Where the LC is greater than the BIC, the ILM is greater than one. That is, a bank with losses that are high relative to its BIC is required to hold higher capital due to the incorporation of internal losses into the calculation methodology. Conversely, where the LC is lower than the

BIC, the ILM is less than one. That is, a bank with losses that are low relative to its BIC is required to hold lower capital due to the incorporation of internal losses into the calculation methodology”<sup>1805</sup>.

- 13.3.23 Where a bank does not have 10 years of high quality data to calculate the LC in the ILM, it may use five years of data. If the data set of good quality data is between five and 10 years, then that data set must be used<sup>1806</sup>. If a bank does not have five years of such data then the ORC is simply the BIC. National supervisors may, however, require banks with less than five years of data to use a shorter data set “if the ILM is greater than 1 and supervisors believe the losses are representative of the bank’s operational risk exposure”<sup>1807</sup>.
- 13.3.24 As has been mentioned above ORC is equal to BIC multiplied by ILM. The resulting number is then multiplied by 12.5 and added to the bank’s risk weighted assets.

#### *Minimum standards for calculating the ILM*

- 13.3.25 In addition to the requirement for banks to have a minimum data set on operational losses (generally, 10 years), banks with a BI above €1 billion must satisfy specified standards to ensure the integrity of the data. Supervisors are expected to review the quality of banks’ data periodically<sup>1808</sup>. If these standards are not met then supervisors may require the bank to calculate an ILM greater than 1 (by a supervisory multiplier applied to the ILM calculated by the bank). Failure to adhere to the loss data standards, and any resulting multiplier, must be disclosed publicly by the bank under Pillar 3<sup>1809</sup>. Banks obviously do not have the option of deciding not to collect data to avoid calculating the ILM (where required).
- 13.3.26 According to the Committee, internal loss data are most relevant when clearly linked to a bank’s current business activities, technological processes and management procedures. Therefore banks are required to document procedures and processes for the identification, collection and treatment of internal loss data, which must be subject to regular review by internal or external audit<sup>1810</sup>.
- 13.3.27 Supervisors may request banks to map their internal data into the following categories: (1) internal fraud; (2) external fraud; (3) employment practices and workplace safety; (4) clients, products and business practices; (5) damage to physical assets; (6) business disruption and systems failures; and (7) execution, delivery and process management<sup>1811</sup>. This is to facilitate supervisory monitoring and not a standard that banks are required to follow in establishing their own internal data sets, although such data sets must be capable of being mapped to the seven categories.
- 13.3.28 Banks’ data sets must be comprehensive and capture all material activities. The minimum threshold is €20,000, although national supervisors may increase this threshold to €100,000 if the BI is greater than €1 billion<sup>1812</sup>.
- 13.3.29 Operational risk losses related to credit risk but not subject to the credit risk framework are operational risks<sup>1813</sup>. Operational risk losses related to market risk are subject to the operational risk framework as such risks are not treated at all under the market risk framework<sup>1814</sup>.

13.3.30 The following specific criteria apply.

- (a) Banks are required to identify gross loss, non-insurance recoveries and insurance recoveries for all operational loss events. Losses in the data set are included net of recoveries after payment<sup>1815</sup>. In determining the gross loss figure the following items must be included:
  - (i) direct charges, including write-downs and those affecting the P&L account;
  - (ii) costs incurred as a consequence of the event, including external expenses and repair or replacement;
  - (iii) provisions or reserves accounted for in the P&L account;
  - (iv) losses stemming from operational loss risk events with a definitive financial impact but not accounted for in the P&L account; and
  - (v) negative economic impacts booked in a financial accounting period due to operational risk events impacting previous accounting periods<sup>1816</sup>.

13.3.31 The following exclusions apply:

- (a) general maintenance on property, plant or equipment;
- (b) expenditures to enhance resilience from operational losses, such as upgrades; and
- (c) insurance premiums<sup>1817</sup>.

13.3.32 In terms of timing, the date the loss event is recorded in the accounts is applied. For legal losses, it is when a reserve is established<sup>1818</sup>.

*Mergers and divestitures, etc.*

13.3.33 Where a bank makes an acquisition then loss data relevant to the acquired business must be added to the bank's data set<sup>1819</sup>.

13.3.34 In certain circumstances banks may seek supervisory approval for operational risk loss events that are no longer relevant e.g. following a divestiture<sup>1820</sup>. The loss must be more than 5% of the bank's average losses<sup>1821</sup>.

13.3.35 Loss data are subject to disclosure even if the national supervisor sets the ILM at 1<sup>1822</sup>.

## 14. LEVERAGE RATIO

### 14.1 Introduction

- 14.1.1 One of the key lessons of the run up to the global financial crisis was an increase in leverage at banks, and, particularly, investment banks. Leverage measures the percentage of a bank's balance sheet that is funded by equity and equivalents, as opposed to debt. Leverage is an aspect of many financial institutions' business models, especially hedge funds, private equity and some corporates, such as project finance. It is neither intrinsically good nor bad. However, the higher the leverage of any institution the more fragile it is, and the greater the risk of small change in the value of its balance sheet wiping out the capital of the firm. For example if a bank is leveraged 50:1, then a decline of just under 2% in the value of its balance sheet will wipe out the bank's equity triggering failure. Such losses could come from credit defaults on the loan portfolio (as in a recession) or from losses in its trading book through losses on traded positions. The latter was prominent in the financial crisis. Yet while making banks more fragile, the differential tax treatment of debt and equity, and that shareholders' liability is limited to the value of their shares, means that management and shareholders may be incentivised to maximise leverage in order to generate higher returns than is socially desirable.
- 14.1.2 The risk-asset ratio certainly places certain indirect constraints on leverage. A bank cannot hold regulatory capital of less than the prescribed minimum, and all assets and off-balance sheet liabilities attract a capital charge. The regulatory minima therefore place an absolute constraint on balance sheet size. Further, most major banks choose to operate significantly above their regulatory constraint for commercial reasons e.g. to maintain a desired credit rating, or to reassure counterparties, depositors and providers of market financing, such as hedge funds and money market funds. However, as the risk-asset ratio is a measure of the risk-adjusted balance sheet, it provides only an indirect constraint. Banks can report high levels of leverage *and* high capital ratios if the risk weights provided by the capital framework are very low. And if the risk-adjusted return (or perceived return) on assets with low risk weights is below that of objectively more risky assets, banks may be incentivised to hold assets in the former class. This happened with very highly rated CDO tranches held by many large banks in their trading book before the crisis. When market liquidity evaporated, large mark-to-market losses emerged, as noted in the chapter on Market Risk.
- 14.1.3 Basel III therefore seeks to remedy this deficiency by supplementing the entire risk-asset framework that has been described in preceding chapters with a simple leverage ratio that would act as a hard constraint on banks' leverage regardless of the risk-weighted asset number, or the quality of their balance sheet.
- 14.1.4 According to the Basel Committee, the leverage ratio is intended to:

- (a) restrict the build-up of leverage in the banking sector and to avoid destabilising deleveraging processes that can damage the broader financial system and the economy; and
- (b) reinforce the risk-based capital requirements with a simple, non-risk-based “backstop” measure<sup>1823</sup>.

14.1.5 The Committee stated that it is of the view that a simple leverage framework is critical and complementary to the risk-based capital framework, and that the leverage ratio should adequately capture both the on- and off-balance sheet sources of banks’ leverage<sup>1824</sup>.

14.1.6 The leverage ratio is in fact conceptually very simple (even if its application to specific transactions is not so). It is the following (expressed as a percentage)<sup>1825</sup>:

$$\text{Leverage ratio} = \frac{\text{Capital measure}}{\text{Exposure measure}}$$

14.1.7 The capital measure is the Tier 1 capital of the bank, measured on a consolidated basis, and after taking account of all relevant deductions from capital<sup>1826</sup>. It is therefore the sum of core Tier 1 capital (common equity) and additional Tier 1 capital (perpetual debt and some preference shares; the relevant definitions are set out in chapter 3) less Tier 1 deductions.

14.1.8 The measure of total exposures is the sum of the following exposures:

- (a) on-balance sheet exposures (excluding on balance-sheet derivative and securities financing transactions);
- (b) off-balance sheet items;
- (c) derivatives exposures; and
- (d) securities financing transaction exposures<sup>1827</sup>.

14.1.9 The leverage ratio is set at 3% at all times<sup>1828</sup>. For global systematically important banks, a higher figure applies that will be mentioned at the end of this chapter.

14.1.10 Both the capital measure and the exposure measure must be calculated on a quarter-end basis, although with supervisory approval banks may use a more frequent basis provided that they do it consistently<sup>1829</sup>. Banks must, however, meet their 3% leverage minimum requirement at all times, and not only at the end of each quarter<sup>1830</sup>.

14.1.11 The *scope* of application of the leverage ratio is the same as for consolidated supervision i.e. the consolidated group<sup>1831</sup>. If a banking, financial, insurance or commercial entity is excluded from consolidation then only the value in the investment in the capital of such entities is taken into account (i.e. the underlying balance sheet is ignored)<sup>1832</sup>. Where proportional consolidation applies, then the same applies to the leverage ratio<sup>1833</sup>. Investments in unconsolidated entities deducted from capital (e.g. insurance subsidiaries,

corporate subsidiaries) are ignored in calculating the leverage ratio to avoid double counting<sup>1834</sup>. Banks using the internal ratings-based approach to credit risk are required to deduct any shortfall in provisions relative to expected losses from common equity. The same amount may be deducted from the leverage ratio exposure measure<sup>1835</sup>. The same applies to prudent valuation adjustments deducted from Tier 1 capital<sup>1836</sup>.

## 14.2 Exposure Measurement

14.2.1 This is where the complexities with the leverage ratio start.

14.2.2 The general rule is that gross accounting values must be used<sup>1837</sup>. However, liability items on the accounting balance sheet may not be deducted, such as gains/losses on fair valued liabilities, and adjustments to the accounting valuation of derivative positions due to changes in a bank's own credit worthiness, must be disregarded<sup>1838</sup>. This is because taking into account such variations is not considered prudent.

14.2.3 Further, banks must (as a general matter) not take account of physical or financial collateral, guarantees or other credit risk mitigation techniques (including netting)<sup>1839</sup>. The leverage ratio framework sets out where this is permissible.

### *Securitisations*

14.2.4 Traditional securitisations may be disregarded if the securitisation meets the risk transfer rules under the securitisation standard. However, any retained tranches are included in the leverage ratio. Traditional securitisations that do not meet the requirements for risk transference, or synthetic securitisations, are included in the leverage ratio<sup>1840</sup>.

### *Other transactions with enhanced risk*

14.2.5 The Basel III text states:

“Banks and supervisors should be particularly vigilant to transactions and structures that have the result of inadequately capturing banks' sources of leverage. Examples of concerns that might arise in such leverage ratio exposure measure minimising transactions and structures may include: securities financing transactions (SFTs) where exposure to the counterparty increases as the counterparty's credit quality decreases or securities financing transactions in which the credit quality of the counterparty is positively correlated with the value of the securities received in the transaction (ie the credit quality of the counterparty falls when the value of the securities falls); banks that normally act as principal but adopt an agency model to transact in derivatives and SFTs in order to benefit from the more favourable treatment permitted for agency transactions under the leverage ratio framework; collateral swap trades structured to mitigate inclusion in the leverage ratio exposure measure; or use of structures to move assets off the balance sheet. This list of examples is by no means exhaustive. Where supervisors are concerned that such transactions are not adequately captured in the leverage ratio exposure measure or may lead to a potentially destabilising deleveraging process, they should carefully scrutinise these transactions and consider a

range of actions to address such concerns. Supervisory actions may include requiring enhancements in banks' management of leverage, imposing operational requirements (eg additional reporting to supervisors) and/or requiring that the relevant exposure is adequately capitalised through a Pillar 2 capital charge<sup>1841</sup>.

#### *Monetary policy Operations*

- 14.2.6 A special treatment may be provided to banks' exposures to the central bank in connection with monetary policy operations which were activated in some jurisdictions during the Covid-19 pandemic. The Basel III text states:

“At national discretion, and to facilitate the implementation of monetary policies, a jurisdiction may temporarily exempt central bank reserves from the leverage ratio exposure measure in exceptional macroeconomic circumstances. To maintain the same level of resilience provided by the leverage ratio, a jurisdiction applying this discretion must also increase the calibration of the minimum leverage ratio requirement commensurately to offset the impact of exempting central bank reserves. In addition, in order to maintain the comparability and transparency of the Basel III leverage ratio framework, banks will be required to disclose the impact of any temporary exemption alongside ongoing public disclosure of the leverage ratio without application of such exemption<sup>1842</sup>.”

#### *On-balance sheet exposures*

- 14.2.7 The following rules apply to the calculation of on-balance sheet exposures:

- (a) Banks must include all balance sheet assets in their leverage ratio exposure measure, including on-balance sheet derivatives collateral and collateral for SFTs, with the exception of on-balance sheet derivative and SFT assets that are subject to separate treatment<sup>1843</sup>. Fiduciary assets held on the bank's regulatory balance sheet may be excluded if the criteria for derecognition and, if relevant, deconsolidation, in IFRS 9 and 10 are met<sup>1844</sup>. Rights of use on leased assets are included<sup>1845</sup>.
- (b) On-balance sheet, non-derivative assets are included in the leverage ratio exposure measure at their accounting values less deductions for associated specific provisions. In addition, general provisions or general loan-loss reserves which have reduced Tier 1 capital may be deducted from the leverage ratio exposure measure<sup>1846</sup>. This also applies to banks using the internal ratings-based approach<sup>1847</sup>.
- (c) Given differences in the accounting treatment of unsettled trades the Basel Committee mandates that banks using trade date accounting must reverse out any offsetting between cash receivables for unsettled sales and cash payables for unsettled purchases of financial assets that may be recognised under the applicable accounting framework, but may offset between those cash receivables and cash payables (regardless of whether such offsetting is recognised under the applicable accounting framework) if the following conditions are met: (1) the financial assets bought and sold that are associated with cash payables and receivables are fair valued through income and included in the bank's trading book; and (2)



the transactions of the financial assets are settled on a delivery-versus-payment (DvP) basis<sup>1848</sup>.

- (d) Banks using settlement date accounting are subject to the treatment set out below<sup>1849</sup>.

*Off-balance sheet exposures*

14.2.8 The basic principle is that off-balance sheet exposures are calculated as notional on-balance sheet exposures using the same credit conversion factors as under the new standardised approach to credit risk.

14.2.9 Off-balance sheet items include commitments and liquidity facilities, whether or not unconditionally cancellable, direct credit substitutes, acceptances, standby letters of credit and trade letters of credit. If the item is treated as a derivative exposure under the bank's relevant accounting standard, then the item must be treated as a derivative exposure for the purpose of the leverage ratio<sup>1850</sup>.

14.2.10 A 100% CCF applies to the following items:

- (a) direct credit substitutes, e.g. general guarantees of indebtedness (including standby letters of credit serving as financial guarantees for loans and securities) and acceptances (including endorsements with the character of acceptances);
- (b) forward asset purchases, forward deposits and partly paid shares and securities, which represent commitments with certain drawdown;
- (c) the exposure amount associated with unsettled financial asset purchases (i.e. the commitment to pay) where regular-way unsettled trades are accounted for at settlement date. Banks may offset commitments to pay for unsettled purchases and cash to be received for unsettled sales provided that the following conditions are met: (a) the financial assets bought and sold that are associated with cash payables and receivables are fair valued through income and included in the bank's trading book; and (b) the transactions of the financial assets are settled on a delivery-versus-payment basis; and
- (d) off-balance sheet items that are credit substitutes not explicitly included in any other category<sup>1851</sup>.

14.2.11 A 50% CCF applies:

- (a) to note issuance facilities and revolving underwriting facilities regardless of the maturity of the underlying facility<sup>1852</sup>; and
- (b) certain transaction-related contingent items (e.g. performance bonds, bid bonds, warranties and standby letters of credit related to particular transactions)<sup>1853</sup>.

14.2.12 A 40% CCF applies to commitments, regardless of the maturity of the underlying facility, unless they qualify for a lower CCF<sup>1854</sup>.

- 14.2.13 A 20% CCF applies<sup>1855</sup> to both the issuing and confirming banks of short-term self-liquidating trade letters of credit arising from the movement of goods (e.g. documentary credits collateralised by the underlying shipment)<sup>1856</sup>.
- 14.2.14 A 10% CCF applies to commitments that are unconditionally cancellable at any time by the bank without prior notice, or that effectively provide for automatic cancellation due to deterioration in a borrower's creditworthiness. National supervisors should evaluate various factors in the jurisdiction, which may constrain banks' ability to cancel the commitment in practice, and consider applying a higher CCF to certain commitments as appropriate<sup>1857</sup>.
- 14.2.15 Where there is an undertaking to provide a commitment on an off-balance sheet item, banks are to apply the lower of the two applicable CCFs<sup>1858</sup>. Off-balance sheet securitisations are subject to the securitisation standard<sup>1859</sup>.

#### *Derivative transactions*

- 14.2.16 Under the leverage ratio exposure measure, exposures to derivatives are included by means of two components:
- (a) the replacement cost (RC); and
  - (b) the potential future exposure (PFE)<sup>1860</sup>.

14.2.17 Banks must calculate their exposures associated with all derivative transactions, including where a bank sells protection using a credit derivative, as a scalar multiplier alpha set at 1.4 times the sum of the RC and the PFE<sup>1861</sup>.

14.2.18 The formula is as follows:

$$\text{exposure measure} = \alpha \times (RC + PFE)$$

14.2.19 These two elements will now be considered in turn.

14.2.20 RC is the replacement cost measured as follows, where:

- (a) V is the market value of the individual derivative transaction or of the derivative transactions in a netting set;
- (b)  $CVM_r$  is the cash variation margin received that meets the conditions set out in the Basel III standard and for which the amount has not already reduced the market value of the derivative transaction V under the bank's applicable accounting standard; and
- (c)  $CVM_p$  is the cash variation margin provided by the bank and that meets the same conditions<sup>1862</sup>.

14.2.21 The equation is:

$$RC = \max(V - CVM_r + CVM_p, 0)$$

14.2.22 The replacement cost is therefore calculated by reference to the market value, less cash margin received less cash margin paid. It is therefore a

calculation of the market value adjusted by margin payments. The minimum is zero i.e. RC can never be negative.

14.2.23 The second part of the calculation is the potential future exposure on the derivative transaction. This is determined as follows:

- (a) for the purposes of the leverage ratio framework, the multiplier is fixed at one.
- (b) when calculating the aggregate add-on component, for all margined transactions the maturity factor set out below may be used; and
- (c) as written options create an exposure to the underlying, they must also be included in the leverage ratio exposure measure, even if certain written options are permitted the zero exposure at default treatment allowed in the risk-based framework<sup>1863</sup>.

14.2.24 The formula is expressed as follows:

$$PFE = multiplier \times AddOn^{aggregate}$$

14.2.25 Banks are allowed to use netting by novation of derivative transactions on a counterparty-by-counterparty basis<sup>1864</sup>. Other form of netting are also allowed<sup>1865</sup>. The following (unsurprising) criteria apply:

- (a) the netting contract or agreement with the counterparty creates a single legal obligation, covering all included transactions, such that the bank would have either a claim to receive or an obligation to pay only the net sum of the positive and negative mark-to-market values of included individual transactions in the event that a counterparty fails to perform due to any of the following: default, bankruptcy, liquidation or similar circumstances;
- (b) written and reasoned legal opinions that, in the event of a legal challenge, the relevant courts and administrative authorities would find the bank's exposure to be such a net amount under: (a) the law of the jurisdiction in which the counterparty is chartered (i.e. incorporated) and, if a foreign branch of a counterparty is involved, then also under the law of jurisdiction in which the branch is located; (b) the law that governs the individual transactions; and (c) the law that governs any contract or agreement necessary to effect the netting;
- (c) the national supervisor, after consultation where necessary with other relevant supervisors, must be satisfied that the netting is enforceable under the laws of each of the relevant jurisdictions; and
- (d) there are procedures in place to ensure that the legal characteristics of netting arrangements are kept under review in the light of possible changes in relevant law<sup>1866</sup>.

14.2.26 These criteria should not give rise to any difficulty under English law (subject to customary qualifications and assumptions). Although the Basel text does not refer to whether the legal opinion is internal or external, we expect most

banks will rely on published netting opinions by trade associations, where available. As elsewhere in the Basel framework, netting agreements that contain a “walkaway clause” are not recognised<sup>1867</sup>.

- 14.2.27 According to the Basel Committee, “Collateral received in connection with derivative contracts has two countervailing effects on leverage: (1) it reduces counterparty exposure; but (2) it can also increase the economic resources at the disposal of the bank, as the bank can use the collateral to leverage itself”<sup>1868</sup>.
- 14.2.28 Therefore, collateral received in connection with derivative contracts may not necessarily reduce the leverage inherent in a bank’s derivative position, which is generally the case if the settlement exposure arising from the underlying derivative contract is not reduced. Therefore, under the leverage ratio, collateral received cannot be netted against derivative exposures regardless of whether netting is permitted under the bank’s accounting or risk-based capital charges (banking book or trading book). However, the maturity factor in the PFE add-on calculation described below may recognise the PFE-reducing effect from regular exchange of variation margin<sup>1869</sup>.
- 14.2.29 Where a bank *provides* collateral to a derivatives counterparty it must gross up its exposure measure by the amount of any collateral provided where the provision of that collateral has reduced the value of its balance sheet assets under the applicable accounting framework<sup>1870</sup>.

#### *Variation margin*

- 14.2.30 For the purpose of the leverage ratio exposure measure, the cash portion of variation margin exchanged between counterparties may be viewed as a form of pre-settlement payment where the following conditions are met:
- (a) for trades not cleared through a qualifying central counterparty the cash received by the recipient counterparty is not segregated i.e. if the recipient counterparty is under no restrictions by law, regulation, or any agreement with the counterparty on using the margin;
  - (b) the variation margin is calculated and exchanged on at least a daily basis based on mark-to-market valuation of derivative positions;
  - (c) the variation margin is received in a currency specified in the derivative contract, governing master netting agreement (MNA), credit support annex or as defined by any netting agreement with a central counterparty (CCP);
  - (d) the variation margin exchanged is the full amount that would be necessary to extinguish the mark-to-market exposure of the derivative subject to the threshold and minimum transfer amounts applicable to the counterparty;
  - (e) derivative transactions and variation margins are covered by a single MNA between the legal entities that are the counterparties in the derivative transaction. The MNA must explicitly stipulate that the counterparties agree to settle net any payment obligations covered by such a netting

agreement, taking into account any variation margin received or provided if a credit event occurs involving either counterparty<sup>1871</sup>.

- 14.2.31 Where all of the above conditions are met, the cash portion of variation margin received may be used to reduce the replacement cost portion of the leverage ratio exposure measure, and the receivables assets from cash variation margin provided may be deducted from the leverage ratio exposure measure as specified in the Basel III standard<sup>1872</sup>.

#### *CCP exposures and client clearing*

- 14.2.32 If a bank acting as a clearing member offers clearing services to clients, the bank's exposures to the CCP that arise when the clearing member is obligated to reimburse its client for any losses suffered due to changes in the value of its transactions in the event that the CCP defaults are covered by the leverage ratio in the same way as any other type of derivative transaction. However, if the clearing member is not obligated to reimburse the client for any losses suffered in the event that the CCP defaults, the clearing member need not recognise the resulting trade exposures to the CCP in the leverage ratio exposure measure. In addition, where a bank provides clearing services as a "higher-level client" within a multi-level client structure, the bank need not recognise in its leverage ratio exposure measure the resulting trade exposures to the clearing member or to an entity that serves as a higher-level client to the bank in the leverage ratio exposure measure. Various requirements apply in the latter two cases<sup>1873</sup>. Basically, the arrangements must prevent any losses to the higher level client, sufficient legal due diligence must be carried out, and the bank has no exposure to its client in the event of the default of the clearing member or the qualifying central counterparty.
- 14.2.33 Where a client enters directly into a derivative transaction with a CCP and the clearing member guarantees the performance of its client's derivative trade exposures to the CCP, the bank acting as the clearing member for the client to the CCP must calculate its related leverage ratio exposure resulting from the guarantee as its own derivative exposure<sup>1874</sup>. Affiliates may be considered as a client if the affiliate is outside the scope of regulatory consolidation at the level at which the leverage ratio is calculated. If it is within scope of consolidation then the transaction is eliminated as Basel III applies on a consolidated basis<sup>1875</sup>.

#### *Written credit derivatives*

- 14.2.34 In addition to the counterparty credit risk (CCR) exposure arising from the fair value of written credit derivatives, such transactions create a notional credit exposure arising from the creditworthiness of the reference entity. This is therefore captured by the leverage ratio<sup>1876</sup>.
- 14.2.35 As a general matter, the effective notional amount referenced by a written credit derivative is included in the leverage ratio exposure measure. The "effective notional amount" is obtained by adjusting the notional amount to reflect the true exposure of contracts that are leveraged or otherwise enhanced by the structure of the transaction. Further, the effective notional amount of a written credit derivative may be reduced by any negative change in fair value amount that has been incorporated into the calculation of Tier 1

capital with respect to the written credit derivative, as well as purchased credit derivatives under certain conditions<sup>1877</sup>.

- 14.2.36 The term “written credit derivative” refers to all credit derivatives through which a bank effectively provides credit protection, and is not limited to credit default swaps and total return swaps, encompassing also all options where a bank has an obligation to provide credit protection under defined circumstances<sup>1878</sup>.
- 14.2.37 Since written credit derivatives are included in the leverage ratio exposure measure at their effective notional amounts, and are also subject to amounts for PFE, the leverage ratio exposure measure for written credit derivatives may be overstated. Banks may therefore choose to exclude from the netting set for the PFE calculation the portion of a written credit derivative which is not offset<sup>1879</sup>.

#### *Purchased credit protection*

- 14.2.38 Two reference obligations are only considered identical if they refer to the same legal entity. A bank can only recognise credit protection on a purchased pool of reference obligations purchased only counts if the protection is equivalent to purchasing credit protection separately on each of the obligors in the pool e.g. purchasing credit protection on an entire securitisation structure<sup>1880</sup>.
- 14.2.39 If a bank purchases credit protection through a total return swap and records the net payments as income, but does not record the offsetting deterioration in the value of the written credit derivative (either by reductions in fair value or reserves) then no offsetting is allowed<sup>1881</sup>.

#### *Securities financing transactions*

- 14.2.40 A bespoke treatment applies to securities financing transactions (SFTs). These are defined as “transactions such as repurchase agreements, reverse repurchase agreements, security lending and borrowing, and margin lending transactions, where the value of the transactions depends on market valuations and the transactions are often subject to margin agreements”<sup>1882</sup>.
- 14.2.41 Where a bank acts as principal the general treatment is as follows. The sum of the following two amounts is included in the leverage ratio exposure measure:
- (a) gross SFT assets recognised for accounting purposes (i.e. with no recognition of accounting netting), adjusted as follows:
    - (i) excluding from the leverage ratio exposure measure the value of any securities received under an SFT, where the bank has recognised the securities as an asset on its balance sheet; and
    - (ii) cash payables and cash receivables in SFTs with the same counterparty may be measured net if all the following criteria are met: (i) the transactions have the same explicit final settlement date; in particular, transactions with no explicit end date but

which can be unwound at any time by either party to the transaction are not eligible; (ii) the right to set off the amount owed to the counterparty with the amount owed by the counterparty is legally enforceable both currently in the normal course of business and in the event of the counterparty's default, insolvency or bankruptcy; and (iii) the counterparties intend to settle net, settle simultaneously, or the transactions are subject to a settlement mechanism that results in the functional equivalent of net settlement (criteria apply); and

- (b) a measure of CCR calculated as the current exposure without an add-on for PFE, calculated as follows. For the purposes of this subparagraph, the term "counterparty" includes not only the counterparty of the bilateral repo transactions but also triparty repo agents that receive collateral in deposit and manage the collateral in the case of triparty repo transactions:
- (i) where a qualifying master netting agreement (MNA) is in place, the current exposure ( $E^*$ ) is the greater of zero and the total fair value of securities and cash lent to a counterparty for all transactions included in the qualifying MNA, less the total fair value of cash and securities received from the counterparty for those transactions; and
  - (ii) where no qualifying MNA is in place, the current exposure for transactions with a counterparty must be calculated on a transaction-by-transaction basis<sup>1883</sup>.

14.2.42 The effects of bilateral netting agreements covering SFTs will be recognised on a counterparty-by-counterparty basis if the agreements are legally enforceable in each relevant jurisdiction upon the occurrence of an event of default and regardless of whether the counterparty is insolvent or bankrupt. In addition, the netting agreements must:

- (a) provide the non-defaulting party with the right to terminate and close out, in a timely manner, all transactions under the agreement upon an event of default, including in the event of insolvency or bankruptcy of the counterparty;
- (b) provide for the netting of gains and losses on transactions (including the value of any collateral) terminated and closed out under it so that a single net amount is owed by one party to the other;
- (c) allow for the prompt liquidation or set-off of collateral upon the event of a default; and
- (d) be, together with the rights arising from provisions required above, legally enforceable in each relevant jurisdiction upon the occurrence of an event of default regardless of the counterparty's insolvency or bankruptcy<sup>1884</sup>.

14.2.43 Netting across positions held in the banking book and trading book is only recognised when the netted transactions fulfil the following conditions: (1) all

transactions are marked to market daily; and (2) the collateral instruments used in the transactions are recognised as eligible financial collateral in the banking book<sup>1885</sup>.

- 14.2.44 As leverage may remain with a lender under an SFT even if sale accounting is achieved, such accounting entries must be reversed when calculating the leverage ratio<sup>1886</sup>. If the bank provides a guarantee or indemnity to both parties then there will be two exposures<sup>1887</sup>.
- 14.2.45 A bank acting as agent in an SFT generally provides an indemnity or guarantee to only one of the two parties involved, and only for the difference between the value of the security or cash its customer has lent and the value of collateral the borrower has provided. In this situation, the bank is exposed to the counterparty of its customer for the difference in values rather than to the full exposure to the underlying security or cash of the transaction (as is the case where the bank is one of the principals in the transaction)<sup>1888</sup>. Where no guarantee is provided then there is no effect on the leverage ratio as the bank is not exposed to risk<sup>1889</sup>.

### 14.3 The Leverage Ratio for G-SIBs

- 14.3.1 An enhanced leverage ratio applies to globally systemically important banks (G-SIBs). This will be very briefly summarised. It supplements the capital surcharge published by the Financial Stability Board (FSB) annually each November for G-SIBs. The latter is outside the scope of this publication as it is an FSB standard.
- 14.3.2 The leverage ratio buffer is set at 50% of a G-SIB's higher loss-absorbency risk-based requirements. For example, a G-SIB subject to a 2% higher loss-absorbency requirement would be subject to a 1% leverage ratio buffer requirement<sup>1890</sup>. This means that instead of 3% the leverage ratio would be 4%.
- 14.3.3 Capital distribution constraints are imposed on a G-SIB which does not meet its leverage ratio buffer requirement in excess of 3%<sup>1891</sup>. This means that the G-SIB leverage ratio is really a capital buffer, similar to the capital conservation buffer and is not a *minimum* requirement, like the 3% leverage ratio, but a ratio that if breached places restrictions, not on a bank's operations and lending but distributions to shareholders, share buy-backs and staff bonus payments. Whether that really matters in practice is an empirical question.
- 14.3.4 As the Basel III standard explains:
- “The capital distribution constraints imposed on G-SIBs will depend on the G-SIB's Common Equity Tier 1 (CET1) risk-based ratio and its leverage ratio. A G-SIB which meets both its CET1 risk-based capital requirements (defined as a 4.5% minimum requirement, a 2.5% capital conservation buffer, the G-SIB higher loss-absorbency requirement and countercyclical capital buffer if applicable) and its Tier 1 leverage ratio requirement (defined as a 3% leverage ratio minimum requirement and the G-SIB leverage ratio buffer) will not be subject to minimum capital conservation standards. A G-SIB which does not meet one of these requirements will be subject to the associated minimum



capital conservation standards. A G-SIB which does not meet both requirements will be subject to the higher minimum capital conservation standard related to its risk-based capital requirement or leverage ratio”<sup>1892</sup>.

- 14.3.5 The table below shows the minimum capital conservation standards for the CET1 risk-based requirements and Tier 1 leverage ratio requirements of a G-SIB in the first bucket of the higher loss-absorbency requirements (i.e. where a 1% risk-based G-SIB capital buffer applies).

CET1 risk-based ratio	Tier 1 leverage ratio	Minimum capital conservation ratios (expressed as a percentage of earnings)
4.5%-5.375%	3%-3.125%	100%
> 5.375%-6.25%	> 3.125%-3.25%	80%
> 6.25%-7.125%	> 3.25%-3.375%	60%
> 7.125%-8%	> 3.375%-3.50%	40%
> 8.0%	> 3.50%	0%

## 15. LARGE EXPOSURES

### 15.1 Introduction

15.1.1 Basel III places restrictions on banks large exposures. The basic rationale for regulating a bank's large exposures is simple. It can be summed up in the adage "don't put all your eggs in one basket". It also reflects the teachings of portfolio theory, or common sense, that diversification of risk is generally preferable to concentration, as a portfolio of a large number of small loans is normally less risky than a small number of large loans. For this reason the Basel Committee places limitations on banks' exposures in excess of a specified percentage of their Tier 1 capital. The large exposures regime generally takes the form of prohibitions, although exceptions may be allowed in a financial crisis. Large exposures regulation has been a feature of banking regulation for decades in the UK and the EU.

15.1.2 According to the Basel Committee:

"Throughout history there have been instances of banks failing due to concentrated exposures to individual counterparties or groups of connected counterparties. Large exposures regulation has been developed as a tool for limiting the maximum loss a bank could face in the event of a sudden counterparty failure to a level that does not endanger the bank's solvency.

A large exposures framework complements the Committee's risk-based capital standard because the latter is not designed specifically to protect banks from large losses resulting from the sudden default of a single counterparty or a group of connected counterparties. In particular, the minimum capital requirements (Pillar 1) of the Basel risk-based capital framework implicitly assume that a bank holds infinitely granular portfolios, i.e. no form of concentration risk is considered in calculating capital requirements. Contrary to this assumption, idiosyncratic risk due to large exposures to individual counterparties or groups of connected counterparties may be present in banks' portfolios. Although a supervisory review process (Pillar 2) concentration risk adjustment could be made to mitigate this risk, these adjustments are neither harmonised across jurisdictions, nor designed to protect a bank against very large losses from the default of a single counterparty or a group of connected counterparties. For this reason the risk-based capital framework is not sufficient to mitigate the microprudential risk from exposures that are large compared to a bank's capital resources. That framework needs to be supplemented with a simple large exposures framework that protects banks from traumatic losses caused by the sudden default of an individual counterparty or group of connected counterparties. To serve as a backstop to risk-based capital requirements, the large exposures framework should be designed so that the maximum possible loss a bank could incur if a single counterparty or group of connected counterparties were to suddenly fail would not endanger the bank's survival as a going concern"<sup>1893</sup>.

15.1.3 In fact, the market risk framework requires idiosyncratic risk to be taken into account, and as a footnote to the text cited above states that trading book models must capture specific risk concentration risk<sup>1894</sup>.

15.1.4 The Basel Committee also argues that a large exposures regime could contribute to mitigating systemic risk:

“The treatment of large exposures could also contribute to the stability of the financial system in a number of other ways. For example, material losses in one systemically important financial institution (SIFI) can trigger concerns about the solvency of other SIFIs, with potentially catastrophic consequences for global financial stability. There are at least two important channels for this contagion. First, investors may be concerned that other SIFIs might have exposures similar to those of the failing institution. Second, and more directly, investors may be concerned that other SIFIs have direct large exposures to the failing SIFI, in the form of either loans or credit guarantees. The Committee is of the view that the large exposures framework is a useful tool to mitigate the risk of contagion between global systemically important banks, thus supporting global financial stability. As a second example, this framework is also seen as a useful tool to contribute to strengthening the oversight and regulation of the shadow banking system, in relation to large exposures, particularly the treatment of exposures to funds, securitisation structures and collective investment undertakings”<sup>1895</sup>.

#### Objectives of the Large Exposures standard

The large exposures standard is part of the Basel III reform package that complements the Basel Committee’s risk-based capital framework to achieve the:

- microprudential objective of serving as a backstop to the risk-based capital regime by protecting banks from incurring large losses from the default of a single counterparty or group of connected counterparties; and
- macroprudential objective of supporting efforts to manage systemic risks by reducing the interconnectedness between systemically important banks.

## 15.2 Scope

15.2.1 The large exposures framework applies on a consolidated basis at every tier where the Basel III framework is required to be applied<sup>1896</sup>. It may also be applied on a wider basis, as has historically been the case in the UK and the EU to non-internationally active banks<sup>1897</sup>.

## 15.3 Definition of a Large Exposure

15.3.1 A large exposure is any exposure of a bank to a counterparty or group of connected counterparties equal to or above 10% of the bank’s Tier 1 capital (core Tier 1 and additional Tier 1 capital) less deductions<sup>1898</sup>.

15.3.2 A counterparty is simply a natural or legal person. A group of connected counterparties requires definition. This encompasses “a group of counterparties with specific relationships or dependencies such that, were one of the counterparties to fail, all of the counterparties would very likely

fail. A group of this sort, referred to in this framework as a group of connected counterparties, must be treated as a single counterparty. In this case, the sum of the bank's exposures to all the individual entities included within a group of connected counterparties is subject to the large exposure limit and to the regular reporting requirements" set out below<sup>1899</sup>.

- 15.3.3 According to the Committee, two natural or legal persons are considered to be connected if either of the following applies:
- (a) one of the counterparties, directly or indirectly, has control over the other(s); or
  - (b) if one of the counterparties were to experience financial problems, in particular funding or repayment difficulties, the other(s), as a result, would also be likely to encounter funding or repayment difficulties<sup>1900</sup>.
- 15.3.4 Before examining these definitions in more detail, it may be questioned whether satisfaction of either of the above tests *necessarily* means that the other counterparty in the group "would be very likely to fail"<sup>1901</sup>. A heightened risk certainly exists, but there are many examples of a parent company, or fellow subsidiaries, not supporting a failed entity, and the second test could be met in a crisis without any idiosyncratic risk to both counterparties. A closing of the commercial paper market does not mean all corporates that issue commercial paper are connected. It is just a financial crisis.
- 15.3.5 Under Basel III, control is established by controlling 50% of the voting rights in the other company<sup>1902</sup>. This is entirely straightforward. However, banks must assess if they have control in any of the following situations:
- (a) voting agreements, such as the control of voting rights under a shareholders' agreement;
  - (b) significant influence on the appointment or dismissal of the administrative, management or supervisory board, such as the right to appoint or remove a majority of those members, or the fact that a majority of members have been appointed solely as a result of an individual entity's voting rights (In England the only such relevant body is the board of directors); and
  - (c) significant influence on senior management such as the power to exercise a controlling influence over the management or policies of another entity (such as consent rights over key decisions). This is most likely to arise in the context of specialised lending such as project finance)<sup>1903</sup>.
- 15.3.6 As banks "must assess connectedness" under the above criteria it is unclear if satisfaction of the criteria means that connectedness is definitely established in these cases. The text of the Basel standard suggests not. Basel III states "[w]here control has been established based on any of these criteria, a bank may still demonstrate to its supervisor in exceptional cases, e.g. due to the existence of specific circumstances and corporate governance safeguards, that such control does not necessarily result in the entities concerned constituting a group of connected counterparties"<sup>1904</sup>. The text is ambiguous if the reference to "any of these criteria" means the standard set in the

definition in LEX 10.10 or the cases where banks must “assess connectedness” in LEX 10.13.

- 15.3.7 Banks are also expected to refer to criteria in internationally recognised accounting standards for qualitative guidance when determining control<sup>1905</sup>. This is clearly not limited to IAS and may include, as appropriate national accounting standards like US GAAP.
- 15.3.8 In determining connectedness based on economic interdependence “banks must consider, at a minimum, the following qualitative criteria”:
- (a) where 50% or more of one counterparty’s gross receipts or gross expenditures on an annual basis is derived from transactions with the other counterparty;
  - (b) where one counterparty has fully or partially guaranteed the exposure of the other counterparty, or is liable by other means, and the exposure is so significant that the guarantor is likely to default if a claim arises;
  - (c) where a significant part of one counterparty’s production is sold to another counterparty which cannot be replaced by other customers;
  - (d) when the expected source of funds to repay the loans of both counterparties is the same, and neither counterparty has another source of independent income to service and repay the loan;
  - (e) where it is likely that financial problems at one counterparty would cause difficulties for other counterparties;
  - (f) where the insolvency of one counterparty is likely to be associated with the default of the other(s); and
  - (g) when two or more counterparties rely on the same source for the majority of funding, and an alternative funding provider cannot be found<sup>1906</sup>.
- 15.3.9 Fortunately, these criteria are indicative as it is possible to envisage circumstances where they are not relevant. An entity may purchase 50% of its expenditure from a supplier in a competitive market where alternative sources of supply exist. Financial problems at one counterparty may cause “difficulties” for the other without such difficulties being capable of being addressed, or where in a crisis every similar financial counterparty faces financial difficulties, as happened to the US motor manufacturers in 2009. A limited nuclear war would doubtless cause countless insolvencies, even if some survived. The same could have been true in the 9/11 terrorist attacks, or a similar attack, should it occur in the future. A recent example of where this happened recently is the response of national governments in most developed, and many other countries, closing deemed non-essential services during the Covid-19 pandemic. If all hospitality is closed by government action then the risks of failure are likely to be highly correlated. However, it would not seem rational to consider all bank exposures to hospitality businesses as a group of connected counterparties during a pandemic as the correlation of risk is entirely dependent on official action taken to combat the

pandemic. In many countries furlough schemes, and analogous support, prevented actual failures, but banks cannot reasonably anticipate or assume such support. Put simply, exogenous geopolitical or health threats cannot be captured by a large exposures framework and should not be.

- 15.3.10 The Committee accepts that “[t]here may, however, be circumstances where some of these criteria do not automatically imply an economic dependence that results in two or more counterparties being connected. Provided that the bank can demonstrate to its supervisor that a counterparty which is economically closely related to another counterparty may overcome financial difficulties, by finding alternative business partners or funding sources within an appropriate time period, the bank does not need to combine these counterparties to form a group of connected counterparties”<sup>1907</sup>. We have argued this microprudential framework may not be appropriate in crises or international emergencies.
- 15.3.11 The Committee also accepts a *de minimis* threshold where investigation of economic interdependencies is not appropriate. Accordingly, banks are expected to identify possible connected counterparties on the basis of economic interdependence only where the sum of all exposures to one counterparty exceeds 5% of Tier 1 capital<sup>1908</sup>.

#### Connected counterparties

Under the Large Exposures standard, when a number of counterparties have specific relationships and dependencies such that a failure of one of the counterparties could lead to cascading failures of the rest, the large exposure limit applies to the cumulative exposures to the group of connected counterparties.

Two parties are connected if at least one of the following criteria is satisfied:

- a control relationship, where one of the counterparties has direct or indirect control over the other
- economic interdependence, where, if one of the counterparties were to experience financial problems, such as funding or repayment difficulties, the other would also encounter financial difficulties.

### 15.4 Limit on Large Exposures

- 15.4.1 The sum of all exposures that a bank has to a single counterparty or to a group of connected counterparties cannot exceed 25% of the bank’s Tier 1 capital<sup>1909</sup>. The Basel Committee states that breaches “must remain the exception ... and must be rapidly rectified”<sup>1910</sup>. It applies across both the banking and trading books. There is no equivalent in the Basel framework for large exposures to the former “soft limits” in the EU for trading book exposures where the limit could be exceeded provided the bank held additional lower quality capital for specified time periods.
- 15.4.2 Equally, unlike the EU approach to large exposures regulation, there is no aggregate limit on the total amount of large exposures a bank may have to different unconnected counterparties. The reasons for this are unclear.

- 15.4.3 Any breach of the 25% limit must be communicated immediately to the supervisor.
- 15.4.4 For G-SIBS the large exposures limit of one G-SIB to another or others is capped at 15% of Tier 1 capital. The list of G-SIBs is published annually (currently in November) by the Financial Stability Board. If a bank is designated as a G-SIB for the first time the 15% limit must be met within 12 months of designation<sup>1911</sup>.
- 15.4.5 Supervisors are free to set more stringent standards. The Committee states that the risks of contagion that justify a lower large exposure limit “applies, in principle, to domestic systemically important banks (D-SIBs). The Committee therefore encourages jurisdictions to consider applying stricter limits to exposures between D-SIBs and to exposures of smaller banks to G-SIBs. The same logic would also be valid for the application of tighter limits to exposures to non-bank global systemically important financial institutions”<sup>1912</sup>. The application of such limits to banks other than G-SIBs is therefore a matter for each national banking supervisor to decide.

#### *Reporting requirements*

- 15.4.6 In addition to immediately reporting breaches of the 25% limit, banks are required to report the following to their national supervisor:
- (a) all exposures with values measured as described below equal to or above 10% of the bank’s Tier 1 capital;
  - (b) all exposures with values gross of any recognised credit risk mitigation equal to or above 10% of the bank’s Tier 1 capital;
  - (c) all exempted exposures with values equal to or above 10% of Tier 1 capital; and
  - (d) their largest 20 exposures to counterparties irrespective of their value<sup>1913</sup>.

### **15.5 Measuring Exposures**

- 15.5.1 We now turn to the detailed requirements in respect of exposure measurements. Given the purpose of the large exposures framework, it is understandable that more conservative measures are used, based on the standardised approaches to credit risk, counterparty credit risk and market risk. However, there are a number of modifications to those calculations that may increase the operational burden on banks applying the framework, for no seemingly obvious purpose. The need for such additional conservatism for an essentially blunt tool such as preventing exposures of more than 25% of a bank’s Tier 1 capital seems not obviously to have been fully justified.
- 15.5.2 All exposures are required to be identified, whether in the banking or trading books, whether on- or off-balance sheet, and exposures with counterparty credit risk<sup>1914</sup>. Exposures deducted from capital are obviously excluded, but exposures risk weighted 1,250% (which is equivalent to a capital deduction) are included<sup>1915</sup>.

- 15.5.3 The measure of an exposure is its accounting value net of specific provisions and value adjustments<sup>1916</sup>. As an alternative, banks may disregard specific provisions and value adjustments and use the gross accounting value<sup>1917</sup>.
- 15.5.4 Exposures arising from counterparty credit risk that are not repo-style transactions must be calculated under the standardised approach to counterparty credit risk (see chapter 4)<sup>1918</sup>.
- 15.5.5 The exposure for repo-style transactions is calculated according to the comprehensive approach to collateral under the standardised approach to credit risk (see chapter 6)<sup>1919</sup>.
- 15.5.6 Off-balance sheet items are calculated applying the credit conversion factors for such transactions under the standardised approach to credit risk (see chapter 4)<sup>1920</sup>.
- 15.5.7 We now proceed to consider which forms of credit risk mitigation are eligible under the large exposures framework, which is more limited than that set out in the chapter on Credit Risk Mitigation when discussing the Basel III framework for credit risk.
- 15.5.8 All of the eligibility criteria and minimum requirements imposed under the standardised approach to credit risk apply. Further only the following types of credit risk mitigation are recognised for large exposures purposes:
- (a) financial collateral (as defined under the standardised approach);
  - (b) guarantees and credit derivatives (as defined under the standardised approach); and
  - (c) on-balance sheet netting (as defined in the standardised approach)<sup>1921</sup>.
- 15.5.9 These are described in chapter 6 on Credit Risk Mitigation.
- 15.5.10 Additional forms of collateral recognised under the internal ratings-based approach (receivables, commercial and residential real estate and other physical collateral) are not recognised<sup>1922</sup>.
- 15.5.11 If a bank uses a credit risk mitigation technique in calculating its risk-based capital requirements, it must do the same under the large exposures framework, if it is eligible<sup>1923</sup>. Hedges are recognised only if the original maturity is at least one year, and the remaining maturity is at least three months<sup>1924</sup>. Maturity mismatches are treated in exactly the same way as under the standardised approach to credit risk<sup>1925</sup>.
- 15.5.12 The effect of credit risk mitigation techniques in reducing the amount of exposures is as follows:
- (a) for unfunded protection (guarantees and credit derivatives) the amount is the value of the protected portion;
  - (b) for collateral, if the bank uses the simple approach to collateral, it is the market value of the financial collateral;



- (c) for collateral, if the bank uses the comprehensive approach to collateral, it is the value of the collateral after applying the supervisory haircuts under the standardised approach; and
- (d) for counterparty credit risk, it is the amount of the collateral calculated under the standardised approach to CCR<sup>1926</sup>.

15.5.13 As the bank is exposed to the provider of the collateral, credit derivative or guarantee, it must also include an exposure to the provider of credit protection<sup>1927</sup>. In the case of collateral, this should be the issuer of the collateral. The amount of such exposure is the amount by which the credit protection has reduced the exposure to the original counterparty<sup>1928</sup>.

## 15.6 Trading Book Exposures

- 15.6.1 As mentioned above, trading book exposures to a counterparty are within the large exposure framework. Banks must add any exposures to a single counterparty in the trading book to any exposure to the same counterparty in the banking book<sup>1929</sup>. However, only those exposures that are exposed to default risk are covered. Thus equities and fixed income instruments are within the large exposures framework. Currencies, gold and commodities are not as there is no issuer<sup>1930</sup>. The exposure value is the jump-to-default amount calculated under the default risk capital requirement component of the standardised approach to market risk, but applying a uniform 100% risk weight for equity and debt positions as opposed to the percentages set out in the standardised approach<sup>1931</sup>. No maturity adjustment applies<sup>1932</sup>. The exposure value for trading book positions to a group of connected counterparties is the sum of positive (net long) gross jump-to-defaults for each counterparty within that group<sup>1933</sup>.
- 15.6.2 Index positions, securitisation exposures and positions in hedge funds and investment funds are carved out from the trading book treatment and subject to the same treatment for such positions under the banking book summarised later in this chapter<sup>1934</sup>. Covered bonds held in the trading book are subject to a bespoke treatment<sup>1935</sup>.
- 15.6.3 Limited offsetting of long and short positions held in the trading book in the same issue is permitted. This means that the issuer, coupon, currency and maturity must be the same. In this case the exposure is the net position<sup>1936</sup>. No mention is made of long and short positions in the same equity, but it would be illogical not to allow banks to calculate a net equity position provided the rights were the same and the issuer identical. Similarly, it would be odd not to allow netting of long and short positions in identical preference shares.
- 15.6.4 Positions in different issues may be offset only if the short position is of the same seniority, or junior, as the long position<sup>1937</sup>. Nothing is said of netting a short position in a preference share against a long position in common equity. Hedges consisting in credit derivatives, provided the short hedged position is junior or of the same seniority as the long position<sup>1938</sup>, are eligible and will generate an exposure to the provider of credit protection<sup>1939</sup>. Banks may recognise no offsetting of different positions in different issues if determining the seniority of the issues is excessively burdensome<sup>1940</sup>.

- 15.6.5 No netting is allowed between the trading book and the banking book<sup>1941</sup>. If the net position is a short position, then it is ignored under the large exposures framework<sup>1942</sup>.
- 15.6.6 As there is no defined standard for derivatives, presumably these are treated as being captured through the counterparty credit risk component referred to above.

## 15.7 Sovereign Exposures

- 15.7.1 Sovereign exposures are exempt from the large exposures limits, as are exposures to central banks, and public sector entities treated as sovereigns under the standardised approach to credit risk. Whether this is a prudent treatment given the Eurozone crisis, and the collapse of at least one major Cypriot bank which was due in part to its significant exposures to restructured Greek sovereign debt may be questioned<sup>1943</sup>.
- 15.7.2 Exposures guaranteed, or secured by financial instruments, issued by such entities are likewise excluded from the large exposures framework<sup>1944</sup>.
- 15.7.3 Two non-sovereign counterparties that are controlled by or economically dependent on a sovereign entity are not treated as a group of connected counterparties<sup>1945</sup>.
- 15.7.4 Sovereign large exposures must be reported to the national supervisor<sup>1946</sup>.

## 15.8 Inter-bank exposures

- 15.8.1 To avoid disturbing the payment and settlement process, intra-day inter-bank exposures are exempt from the large exposures framework, and need not be reported to national supervisors<sup>1947</sup>. End-of-day exposures are subject to the framework. The Basel Committee has stated that in stressed circumstances, supervisors may have to accept a breach of the limit on inter-bank exposures ex post to help ensure stability in the inter-bank market<sup>1948</sup>.

## 15.9 Covered Bonds

- 15.9.1 A covered bond is defined as “bonds issued by a bank or mortgage institution [which] are subject by law to special public supervision designed to protect bond holders. Proceeds deriving from the issue of these bonds must be invested in conformity with the law in assets which, during the whole period of validity of the bonds, are capable of covering claims attached to the bonds and which, in the event of the failure of the issuer, would be used on a priority basis for the reimbursement of the principal and payment of the accrued interest”<sup>1949</sup>.
- 15.9.2 Covered bonds meeting this definition may be assigned an exposure value of no less than 20% of the nominal value of the bank’s covered bond holding. Covered bonds not satisfying this definition receive a 100% exposure value. The exposure is to the issuing bank<sup>1950</sup>. It is unclear if this 20% treatment also applies to unregulated mortgage institutions that meet the definition above. In many jurisdictions, mortgages may be originated by unregulated lenders<sup>1951</sup>.

- 15.9.3 To receive an exposure weight of 20%, or any amount less than 100%, the exposures in the pool of assets backing the covered bond must consist of<sup>1952</sup>:
- (a) claims on, or guaranteed by, sovereigns, central banks, public sector entities or multilateral development banks<sup>1953</sup>;
  - (b) claims secured by mortgages on residential real estate that would qualify for a 35% or lower risk weight under the standardised approach to credit risk and have a loan-to-value ratio of 80% or lower; and
  - (c) claims secured by commercial real estate that would qualify for the 100% or lower risk weight under the standardised approach and have a loan-to-value ratio of 60% or lower.
- 15.9.4 These requirements must continue to be met throughout the maturity of the covered bond<sup>1954</sup>, presumably by substituting non-compliant assets.
- 15.9.5 In addition the nominal value of the pool of assets should exceed the value of the covered bond issuance by at least 10% on an on-going basis to qualify for the lower exposure figure. This buffer may be made up, in addition to the above assets, by cash, short-term liquid and secure assets and derivatives entered into for hedging purposes<sup>1955</sup>.

*Funds, securitisations and other structures with underlying assets (including hedge funds)*

- 15.9.6 Banks may assign the exposure value to the structure as a single separate counterparty if the bank's exposure to each of the underlying assets contained in the structure is less than 0.25% of its Tier 1 capital. In this case there is no need to look through the structure<sup>1956</sup>. A note adds that this test is by definition satisfied if the bank's investment in a structure is less than 0.25% of its Tier 1 capital<sup>1957</sup>, which is correct. However, the bank is required to be able to demonstrate that regulatory arbitrage considerations did not influence the decision not to look through i.e. that the bank is not circumventing the large exposures framework by investing in a large number of immaterial transactions with identical underlying assets<sup>1958</sup>.
- 15.9.7 In all other cases the bank must look through the structure to those assets in the fund or securitisation and identify all underlying assets whose exposure value equals or is above 0.25% of its Tier 1 capital. For such assets the bank must identify the counterparty corresponding to those assets so as to add that exposure to all other exposures in calculating whether overall the aggregate exposure to that counterparty is a large exposure. Any individual exposure under 0.25% of Tier 1 capital may be treated as an exposure to the structure itself, and then aggregated to provide the exposure to the structure as a whole<sup>1959</sup>.
- 15.9.8 If a bank is unable to identify the underlying assets of a structure (which may be common in some securitisations or re-securitisations), then if the total exposure is under 0.25% of the bank's Tier 1 capital the exposure is treated as an exposure to the structure (and by definition cannot constitute a large exposure). In all other cases the exposure is treated as an exposure to an unknown client<sup>1960</sup>.

- 15.9.9 Banks must aggregate all unknown client exposures as if they related to a single counterparty, and apply the large exposures framework to that composite unknown client. In other words, if the unknown client exposure exceeds 10% of Tier 1 capital it is a reportable large exposure, and such exposure is capped at 25% of Tier 1 capital.
- 15.9.10 Where a bank does not fully own all of the structure (as will be commonly the case) then only the *pro rata* share matters. So if a bank owns 1% of a fund that invests in 20 assets with a value of 5 each the exposure value is 0.05 in respect of each of the underlying assets<sup>1961</sup>.
- 15.9.11 If a bank is required to apply the look through approach to a tranching structure (e.g. a securitisation) then the exposure value to a counterparty is measured for each tranche within the structure assuming a *pro rata* distribution of losses within each tranche (as occurs in securitisations). When calculating the exposure value the bank must:
- (a) firstly, consider the lower of the value of the tranche in which the bank invests and the nominal value of each underlying asset included in the underlying portfolio of assets; and
  - (b) secondly, apply the *pro rata* share of the bank's investment in the tranche to the value determined in the first step<sup>1962</sup>.
- 15.9.12 In other words, the exposure calculation is driven by the underlying value of the tranche.
- 15.9.13 Banks are also required to identify third parties that could constitute an additional risk factor in a structure beyond the structure itself. Examples given include the originator, fund manager, liquidity provider and provider of credit protection<sup>1963</sup>. Such additional risk factors are most likely in a traditional securitisation where there may be many such entities, such as a swap counterparty, providers of liquidity facilities, providers of credit enhancements, depositaries, etc. Funds may also have depositaries.
- 15.9.14 According to the standard, the identification of an additional risk factor has two implications:
- (a) banks must connect their investments in those structures to form a group of connected counterparties; and
  - (b) banks may add their investments in a set of structures associated with a third party that constitutes a common risk factor to other exposures to that third party (e.g. a loan or derivative)<sup>1964</sup>.
- 15.9.15 In fact, a case-by-case approach is required when considering whether there is an additional risk factor that generates an additional exposure under the standard, and to whom that exposure is to be allocated.

#### *Exposures to central counterparties*

- 15.9.16 The treatment depends on whether the central counterparty is or is not a qualifying central counterparty. A qualifying central counterparty is a

regulated central counterparty, regulated in the jurisdiction in which it is based, and is subject to rules consistent with the Committee on Payment and Financial Infrastructure and IOSCO *Principles for Financial Markets*<sup>1965</sup>.

- 15.9.17 Exposures to qualifying central counterparties are exempt from large exposure limits, but must still be reported<sup>1966</sup>. Whether this is really a prudent treatment depends on the assumption that such counterparties will never fail. However, as most are privately owned companies, it is unclear whether such an assumption is really warranted. On the other hand, the regulatory drive to push clearing of OTC derivatives to central counterparties means that such a treatment may be necessary to encourage central clearing. We are not aware of any major central counterparty having failed, but the significant use of central counterparties, and the volumes of business transacted through them, is a relatively recent development. Previously, clearing and settlement was generally effected without central counterparties.
- 15.9.18 For trades cleared with other non-qualifying central counterparties then the normal 10% and 25% limits apply<sup>1967</sup>.
- 15.9.19 However, for all central counterparties, there is no concept (or restriction by virtue of) connected counterparties in respect of exposures specifically related to clearing activities<sup>1968</sup>.

#### *Non-clearing exposures*

- 15.9.20 An FAQ states that for exposures to a qualifying central counterparty trading exposures and default fund contributions are treated as exempt clearing exposures, whereas a liquidity facility, or a loan, to the central counterparty is not<sup>1969</sup>.
- 15.9.21 For other central counterparties the following applies:
- (a) for trade exposures, it depends on the type of exposure. Derivatives are subject to the counterparty credit risk framework;
  - (b) segregated initial margin attracts no exposure value;
  - (c) unsegregated margin attracts an exposure value equal to its nominal amount;
  - (d) pre-funded default fund contributions attract an exposure value equal to the nominal amount;
  - (e) unfunded default fund contributions attract no exposure value; and
  - (f) equity investments have an exposure value equal to the nominal amount<sup>1970</sup>.
- 15.9.22 Any other exposure to a CCP attracts the exposure value applicable to any other counterparty under the large exposures framework e.g. loans and guarantees, and is aggregated together and subject to the limit on large exposures<sup>1971</sup>.

## 16. LIQUIDITY COVERAGE RATIO

### 16.1 Introduction

- 16.1.1 A striking aspect of Basel II was its total failure to address liquidity risks and, in particular, the risk that a bank might not be able to fund its operations at all times by disposing of balance sheet assets to meet liabilities at the due date. This is the more surprising in that it is in the nature of banking to engage in maturity transformation: borrowing short-term (e.g. deposits, repos) and making long term loans (mortgages, corporate facilities). Banks are not alone in engaging in maturity transformation, as private equity and hedge funds do the same, as do some corporates, although they present less risk to financial stability<sup>1972</sup>. The unexpressed assumption underlying Basel II was that liquidity would always be available in the market at a price, which it was before 2007, against a very wide range of assets, until the financial crisis, at the height of which the interbank lending market effectively closed and central banks had to provide virtually unlimited liquidity to enable banks to continue to function. Governments also guaranteed corporate lending when corporates were unable to issue commercial paper or otherwise roll over existing facilities.
- 16.1.2 A lack of liquidity was the proximate cause of the failure of many institutions in the financial crisis including Northern Rock, Bear Stearns, Lehman Brothers, Countrywide Financial, and Wachovia. Although many of these were not banks, the risks to small uninsured depositors is seen as justifying stricter regulation than that applied to non-deposit taking lenders such as Countrywide Financial. It is therefore unsurprising that the Basel Committee as part of its initial work announced the formulation of two new liquidity metrics: the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR). The former is the subject of the present chapter and the latter the next chapter. Both ratios are now in force, having been required to be implemented by 1 January 2019.
- 16.1.3 The purpose of the LCR is “to promote the short-term resilience of the liquidity risk profile of banks by ensuring that they have sufficient high-quality liquid assets (HQLA) to survive a significant stress scenario lasting 30 calendar days”<sup>1973</sup>. The scenario for this is based on a combined idiosyncratic and market-wide stress. The following are assumed:
- (a) the run-off of a proportion of retail deposits;
  - (b) a partial loss of unsecured wholesale funding;
  - (c) a partial loss of secured, short-term financing with certain collateral and counterparties;
  - (d) additional contractual outflows that would arise from a downgrade in the bank’s public credit rating by up to and including three notches, including collateral posting requirements;

- (e) increases in market volatilities that impact the quality of collateral or potential future exposure of derivative positions and thus require larger collateral haircuts or additional collateral, or lead to other liquidity needs;
- (f) unscheduled draws on committed but unused credit and liquidity facilities that the bank has provided to its clients; and
- (g) the potential need for the bank to buy back debt or honour non-contractual obligations in the interest of mitigating reputational risk<sup>1974</sup>.

#### 16.1.4 According to the Committee:

“This stress test should be viewed as a minimum supervisory requirement for banks. Banks are expected to conduct their own stress tests to assess the level of liquidity they should hold beyond this minimum, and construct their own scenarios that could cause difficulties for their specific business activities. Such internal stress tests should incorporate longer time horizons than the one mandated by this standard. Banks should share the results of these additional stress tests with supervisors”<sup>1975</sup>.

## 16.2 Calculation of the LCR

### 16.2.1 The LCR is based on the relationship of two components:

- (a) the value of the stock of high quality liquid assets (HQLA); and
- (b) total net outflows calculated in accordance with specified scenarios prescribed by the Basel Committee<sup>1976</sup>.

### 16.2.2 It should be noted that there is only one way to calculate the LCR. There are no options, and other than for internal stress testing purposes a bank’s own LCR data are irrelevant. No internal model is permitted for any bank.

### 16.2.3 The ratio is expressed as follows:

$$\frac{\text{Stock of HQLA}}{\text{Total net cash outflows over the next 30 calendar days}} \geq 100\%$$

### 16.2.4 The Basel Committee recognises that while the LCR standard must be observed at all times in normal market conditions, it is not an absolute figure in crises. The Committee states:

“The standard requires that, absent a situation of financial stress, the value of the ratio be no lower than 100% (ie the stock of HQLA should at least equal total net cash outflows) on an ongoing basis because the stock of unencumbered HQLA is intended to serve as a defence against the potential onset of liquidity stress. During periods of stress, however, it would be entirely appropriate for banks to use their stock of HQLA, thereby falling below the minimum. Supervisors will subsequently assess this situation and will give guidance on usability according to the circumstances”<sup>1977</sup>.

16.2.5 In a stressed situation the LCR therefore takes on aspects of a buffer as banks can use their stock of HQLA. The Committee further explains:

“a bank’s use of its HQLA should be guided by consideration of the core objective and definition of the LCR. Supervisors should exercise judgement in their assessment and account not only for prevailing macro-financial conditions, but also consider forward-looking assessments of macroeconomic and financial conditions. In determining a response, supervisors should be aware that some actions could be pro-cyclical if applied in circumstances of market-wide stress”<sup>1978</sup>.

16.2.6 In particular:

- (a) supervisors should assess conditions at an early stage, and take actions if deemed necessary, to address potential liquidity risk;
- (b) supervisors should allow for differentiated responses to a reported LCR below 100%. Any potential supervisory response should be proportionate with the drivers, magnitude, duration and frequency of the reported shortfall;
- (c) supervisors should assess a number of firm- and market-specific factors in determining the appropriate response, as well as other considerations related to both domestic and global frameworks and conditions. Potential considerations include, but are not limited to:
  - (i) the reason(s) that the LCR fell below 100%. This includes use of the stock of HQLA, an inability to roll over funding or large unexpected draws on contingent obligations. In addition, the reasons may relate to overall credit, funding and market conditions, affecting individual banks or all institutions, regardless of their own condition;
  - (ii) the extent to which the reported decline in the LCR is due to a firm-specific or market-wide shock;
  - (iii) a bank’s overall health and risk profile, including activities, positions with respect to other supervisory requirements, internal risk systems, controls and other management processes, among others;
  - (iv) the magnitude, duration and frequency of the reported decline of HQLA;
  - (v) the potential for contagion to the financial system and additional restricted flow of credit or reduced market liquidity due to actions to maintain an LCR of 100%; and
  - (vi) the availability of other sources of contingent funding such as central bank funding, or other actions by prudential authorities; and



- (d) supervisors should have a range of tools at their disposal to address a reported LCR below 100%. Banks may use their stock of HQLA in both idiosyncratic and systemic stress events, although the supervisory response may differ between the two;
  - (i) at a minimum, a bank should present an assessment of its liquidity position, including the factors that contributed to its LCR falling below 100%, the measures that have been and will be taken and the expectations on the potential length of the situation. Enhanced reporting to supervisors should be commensurate with the duration of the shortfall;
  - (ii) if appropriate, supervisors could also require actions by a bank to reduce its exposure to liquidity risk, strengthen its overall liquidity risk management, or improve its contingency funding plan; and
  - (iii) but, in a situation of sufficiently severe system-wide stress, effects on the entire financial system should be considered. Potential measures to restore liquidity levels should be discussed, and should be executed over a period of time considered appropriate to prevent additional stress on the bank and on the financial system as a whole; and
- (e) supervisors' responses should be consistent with the overall approach to the prudential framework<sup>1979</sup>.

### *Reporting*

16.2.7 The LCR is reported at least monthly, with a time lag of not more than two weeks, and ideally "as short as feasible". Supervisors may require banks to calculate their LCR on a weekly or even daily basis in stressed situations. Banks must have systems capable of performing this calculation<sup>1980</sup>. If the LCR falls below, or is expected to fall below, 100% the national supervisor must be informed immediately<sup>1981</sup>.

### *Currency*

16.2.8 The consolidated LCR is calculated in a common currency, although banks and supervisors must be aware of liquidity needs in each significant currency. The stock of HQLA assets should be similar in composition to the operational needs of the bank. Banks cannot assume that currencies will remain transferrable in a stress period<sup>1982</sup>. Although this is correct, it is hard to see how banks can plan for such events. For example, the Icelandic krona was subject to capital controls in 2008 and in 2015 Greece imposed capital controls on transactions in euros. In normal times the krona and the euro are fully transferrable.

## **16.3 Scope of Application**

16.3.1 The scope of the LCR framework is identical to that of the risk-based Basel III framework. It applies on a consolidated basis at the level of each internationally active bank as set out in the chapter on consolidated supervision. However, national supervisors may apply the LCR to "other banks and on any subset of entities of internationally active banks as well to ensure

greater consistency and a level playing field between domestic and cross-border banks”<sup>1983</sup>.

- 16.3.2 National supervisors are required to determine which investments in banking, securities and financial entities that are not consolidated should be considered significant e.g. if the bank is the main liquidity provider in a time of stress. Supervisors are tasked with agreeing with each bank on a case-by-case basis on an appropriate methodology for quantifying potential liquidity draws, which are treated as “other contingent funding operations” (see below)<sup>1984</sup>. Regardless of the consolidation status, banks are instructed that they should actively monitor and control liquidity risk and funding needs at legal entities and foreign branches<sup>1985</sup>.
- 16.3.3 As there are some national discretions in the LCR framework, and national supervisors may take a more stringent approach to banks operating in their jurisdiction, Basel III addresses this as follows.
- 16.3.4 When calculating the LCR on a consolidated basis the LCR should be calculated using the rules of the consolidating supervisor for all legal entities, except for retail and small business deposits. For the latter deposits it is the LCR framework in the jurisdiction where the branch or subsidiary operates that is relevant<sup>1986</sup>. If, however, the requirements in the jurisdiction of the branch/subsidiary do not exist, the LCR has not been implemented or the consolidating supervisor considers that stricter requirements for such deposits in its jurisdiction should be applied then the rules of the consolidating supervisor apply in place of local rules<sup>1987</sup>.
- 16.3.5 Banks must also reflect in their LCR calculation any transfer restrictions on liquidity within the consolidated group e.g. ring-fencing rules, non-convertible currencies, foreign exchange controls, sanctions. Thus non-transferable HQLA may satisfy the LCR to the extent used to cover cash outflows in that jurisdiction, but any surplus HQLA that is not transferable must be disregarded<sup>1988</sup>.
- 16.3.6 We now proceed to consider the two components of the LCR: the definition of high quality liquid assets (HQLA) and then the regulatory cash inflows and outflows.

## 16.4 High Quality Liquid Assets

- 16.4.1 The Basel Committee sets out a standard metric for assessing which assets constitute HQLA, whilst permitting the use of alternative approaches in those jurisdictions where there are not enough of the various tiers of HQLAs e.g. jurisdictions with limited available HQLA in the domestic currency. We will describe the standard definition first as it must be used if it can.

### *Purpose of HQLA and fundamental standards*

- 16.4.2 According to the LCR standard:

“The numerator of the Liquidity Coverage Ratio (LCR) is the ‘stock of high-quality liquid assets (HQLA)’. Under the standard, banks must hold a stock of unencumbered HQLA to cover the total net cash outflows (as defined in

LCR40) over a 30-day period under the stress scenario prescribed in LCR20. In order to qualify as HQLA, assets should be liquid in markets during a time of stress and, ideally, be central bank eligible”<sup>1989</sup>.

- 16.4.3 The following standards set out the “characteristics that such assets should generally possess and the operational requirements that they should satisfy”<sup>1990</sup>. It seems to follow that the characteristics are only indicative and that assets that do not meet them in individual cases, but fall within the list of approved HQLA, remain eligible. National supervisors may determine, however, that listed assets that are not sufficiently liquid in private markets cannot be included in banks HQLA stock<sup>1991</sup>. Therefore the final decision lies with national supervisors.
- 16.4.4 Assets are considered to be HQLA if they can be easily and immediately converted into cash at little or no loss of value. The liquidity of an asset depends on the underlying stress scenario, the volume to be monetised and the timeframe considered. Nevertheless, there are certain assets that are more likely to generate funds without incurring large discounts in sale or repurchase agreement (repo) markets due to fire-sales even in times of stress. The following section outlines the factors that influence whether or not the market for an asset can be relied upon to raise liquidity when considered in the context of possible stresses<sup>1992</sup>.
- 16.4.5 According to the Basel Committee, in most jurisdictions HQLA should be central bank eligible in addition to being liquid in markets during stressed periods. In jurisdictions where central bank eligibility is limited to an extremely narrow list of assets, a supervisor may allow unencumbered, non-central bank eligible assets that meet the qualifying criteria for Level 1 or Level 2 assets to count as part of its stock of HQLA<sup>1993</sup>.
- 16.4.6 The following characteristics are stated to be “fundamental”:
- (a) low risk. Less risky assets tend to have higher liquidity, although this may not always be the base e.g. highly rated sovereign bonds issued by a jurisdiction with a very small money supply;
  - (b) ease and certainty of valuation. Ease of agreeing the market value contributes to liquidity. Most exotic or structured products should be excluded;
  - (c) low correlation with risky assets. Assets constituting HQLA should not be positively correlated with risky assets; and
  - (d) they are listed on a developed and recognised exchange<sup>1994</sup>.
- 16.4.7 The following market-related characteristics apply:
- (a) the assets should have an active outright sale or repo market at all times, demonstrated by historical evidence of market breadth and depth, and the existence of robust market infrastructure;
  - (b) the assets should have a low volatility in the market price with historical evidence of market terms and volumes during stressed periods; and

- (c) the asset has characteristics of a flight to quality in a systemic crisis<sup>1995</sup>.

16.4.8 Basel III sets the following operational characteristics. These requirements are designed to ensure that the stock of HQLA is managed in such a way that the bank can immediately use the stock of assets as a source of contingent funds; and that the stock of assets is available for the bank to convert into cash through outright sale or repo, to fill funding gaps between cash inflows and outflows at any time during the 30-day stress period<sup>1996</sup>:

- (a) banks must periodically monetise a representative proportion of the assets in the stock through repo or outright sale, in order to test its access to the market, the effectiveness of its processes for monetisation, the availability of the assets, and to minimise the risk of negative signalling during a period of actual stress. The requirement for periodic monetisation may be satisfied by transactions in the bank's normal course of business<sup>1997</sup>;
- (b) all assets in the HQLA stock must be unencumbered. "Unencumbered" means free of legal, regulatory, contractual or other restrictions on the ability of the bank to liquidate, sell, transfer or assign the asset. An asset in the stock must not be pledged to secure, collateralise or credit-enhance any transaction, nor be designated to cover operational costs (such as rents and salaries). Assets received in reverse repo and securities financing transactions that are held at the bank, have not been re-hypothecated, and are legally and contractually available for the bank's use, can be considered as part of the stock of HQLA<sup>1998</sup>;
- (c) banks must exclude from the HQLA stock those assets that, although meeting the definition of "unencumbered", in respect of which the bank does not have the operational capability to monetise to meet outflows during the stress period<sup>1999</sup>;
- (d) the stock must be under the control of the function charged with managing the liquidity of the bank (e.g. group treasury), meaning the function has the continuous authority, and legal and operational capability, to monetise any asset in the stock. Control must be evidenced either by maintaining assets in a separate pool managed by the function with the sole intent for use as a source of contingent funds, or by demonstrating that the function can monetise the asset at any point in the 30-day stress period<sup>2000</sup>;
- (e) in assessing whether assets are freely transferable for regulatory purposes, banks should be aware that assets may not be freely available to the consolidated entity due to regulatory, legal, tax, accounting or other impediments<sup>2001</sup>;
- (f) in certain jurisdictions, large, deep and active repo markets do not exist for eligible asset classes, and therefore such assets are likely to be monetised through outright sale. In these circumstances, a bank must exclude from the stock of HQLA those assets where there are impediments to sale, such as large fire-sale discounts which would cause it to breach minimum solvency requirements, or requirements to hold

such assets, including, but not limited to, statutory minimum inventory requirements for market-making<sup>2002</sup>; and

- (g) banks must not include in the stock of HQLA any assets, or liquidity generated from assets, they have received under rights of re-hypothecation, if the beneficial owner has the contractual right to withdraw those assets during the 30-day stress period<sup>2003</sup>. However, assets received as collateral for derivatives transactions that are not segregated and are legally able to be re-hypothecated may be included in the stock of HQLA provided that the bank records an appropriate outflow for the associated risks<sup>2004</sup>. Under English law re-hypothecation requires an outright transfer of title.

### *Diversification*

- 16.4.9 The stock of HQLA should be well diversified within the asset classes themselves (except for sovereign debt of the bank's home jurisdiction, or from the jurisdiction in which the bank operates), central bank reserves, central bank debt securities, and cash). Although some asset classes are more likely to remain liquid irrespective of circumstances, *ex ante* it is not possible to know with certainty which specific assets within each asset class might be subject to shocks *ex post*. Banks should therefore have policies and limits in place in order to avoid concentrations with respect to asset types, issue and issuer types, and currency<sup>2005</sup>.

### *Regulatory definition of HQLA*

- 16.4.10 This section sets out the definition of the classes of HQLA specified by the Basel Committee, although assets included here may be rendered ineligible by supervisory (or bank) discretion based on the matters discussed in the preceding paragraphs.
- 16.4.11 The stock of HQLA "should comprise assets with the characteristics outlined in LCR30.2 to LCR30.12. This wording raises the question if other assets could be included at either national or bank discretion under national implementation of this standard. We now describe the types of assets that meet these characteristics and can therefore, in principle, be included in the stock.
- 16.4.12 There are two categories of assets that can be included in the stock. Assets to be included in each category are those that the bank is holding on the first day of the stress period, irrespective of their residual maturity. Level 1 assets can be included without limit, while Level 2 assets can only comprise up to 40% of the stock<sup>2006</sup>.
- 16.4.13 Supervisors may also choose to include within Level 2 an additional class of assets (Level 2B assets). If included, these assets must not comprise more than 15% of the total stock of HQLA. They must also be included within the overall 40% cap on Level 2 assets<sup>2007</sup>.
- 16.4.14 The 40% cap on Level 2 assets and the 15% cap on Level 2B assets is determined after the application of required haircuts, and after taking into account the unwinding of short-term securities financing transactions and collateral swap

transactions maturing within 30 calendar days that involve the exchange of HQLA<sup>2008</sup>.

- 16.4.15 The maximum amount of adjusted Level 2 assets is equal to two-thirds of the adjusted amount of Level 1 assets after the haircuts have been applied. The calculation of the 40% cap on Level 2 assets takes into account any reduction in eligible Level 2B assets on account of the 15% cap on Level 2B assets<sup>2009</sup>.
- 16.4.16 Further, the calculation of the 15% cap on Level 2B assets must take into account the impact on the stock of HQLA of the amounts of HQLA involved in secured funding, secured lending and collateral swap transactions maturing within 30 calendar days. The maximum amount of adjusted Level 2B assets is equal to the ratio of 15/85 times the sum of the adjusted amounts of Level 1 and Level 2A assets, or, in cases where the 40% cap is binding, up to a maximum of 1/4 times the adjusted amount of Level 1 assets, both after haircuts have been applied<sup>2010</sup>.
- 16.4.17 The adjusted amount of Level 1 assets is defined as the amount of Level 1 assets that would result after unwinding short-term secured funding, secured lending and collateral swap transactions involving the exchange of any HQLA for any Level 1 assets (including cash) that meet, or would meet if held unencumbered, the operational requirements for HQLA set out above. The adjusted amount of Level 2A assets is defined as the amount of Level 2A assets that would result after unwinding those short-term secured funding, secured lending and collateral swap transactions involving the exchange of any HQLA for any Level 2A assets that meet, or would meet if held unencumbered, the operational requirements for HQLA<sup>2011</sup>.
- 16.4.18 The adjusted amount of Level 2B assets is defined as the amount of Level 2B assets that would result after unwinding those short-term secured funding, secured lending and collateral swap transactions involving the exchange of any HQLA for any Level 2B assets that meet, or would meet if held unencumbered, the operational requirements for such assets<sup>2012</sup>.
- 16.4.19 In cases where collateral received in a short-term secured lending or collateral swap transaction would meet the operational requirements if held unencumbered, but has been re-hypothecated in a short-term secured funding or collateral swap transaction, both transactions must be unwound for the purpose of calculating the adjusted HQLA amounts<sup>2013</sup>.
- 16.4.20 The formula for the calculation of the stock of HQLA is as follows<sup>2014</sup>:
- $$\begin{aligned} \text{Stock of HQLA} &= \text{Level1} + \text{Level2A} + \text{Level2B} - \text{adjustment for 15\% cap} \\ &\quad - \text{adjustment for 40\% cap} \end{aligned}$$
- 16.4.21 In other words, the total stock of HQLA is the sum of Level 1, Level 2A and (where permitted by the national regulator) Level 2B HQLA adjusted by the cap for Level 2A and 2B assets. The following two caps are calculated as follows<sup>2015</sup>:

$$\text{Adjustment for 15\%cap} = \max \left( \left( \text{adjusted Level2B} - \frac{15}{85} \times (\text{adjusted Level1} + \text{adjusted Level2A}) \right) \times \left( \text{adjusted Level2B} - \frac{15}{60} \times (\text{adjusted Level1}) \right), 0 \right)$$

$$\text{Adjustment for 40\%cap} = \max \left( \left( \text{adjusted Level2A} + \text{adjusted Level2B} - \frac{2}{3} \times (\text{adjusted Level1}) \right) \times \left( \text{adjusted Level2B} - \frac{15}{85} \times (\text{adjusted Level1} + \text{adjusted Level2A}) \right), 0 \right)$$

### Level 1 assets

16.4.22 As has been mentioned, Level 1 assets are not subject to any quantitative limit and are not subject to haircuts under the LCR framework. However, national supervisors may impose such haircuts<sup>2016</sup>.

16.4.23 Level 1 HQLA consists of the following assets:

- (a) coins and banknotes;
- (b) central bank reserves (including required reserves - but not term deposits), to the extent that the central bank policies allow them to be drawn down in times of stress - to be agreed between banking supervisors and the central bank;
- (c) marketable securities representing claims on or guaranteed by sovereigns, central banks, PSEs, the Bank for International Settlements, the International Monetary Fund, the European Central Bank, the European Community [Union], the European Stability Mechanism, the European Financial Stability Facility or multilateral development banks, and satisfying all of the following conditions:
  - (i) they are assigned a 0% risk weight under the standardised approach to credit risk;
  - (ii) they are traded in large, deep and active repo or cash markets, characterised by a low level of concentration;
  - (iii) they have a proven record as a reliable source of liquidity in the markets (through repo or outright sale) even during stressed market conditions; and
  - (iv) they are not an obligation of a financial institution or any of its affiliated entities;
- (d) where the sovereign has a non-0% risk weight, sovereign or central bank debt securities issued in domestic currencies by the sovereign or central bank in the country in which the liquidity risk is being taken or in the bank's home country; and
- (e) where the sovereign has a non-0% risk weight, domestic sovereign or central bank debt securities issued in foreign currencies are eligible up

to the amount of the bank's stressed net cash outflows in that specific foreign currency stemming from the bank's operations in the jurisdiction where the bank's liquidity risk is being taken<sup>2017</sup>.

#### *Level 2A assets*

16.4.24 These are always eligible, subject to the 40% cap on HQLA and the 15% haircut referred to above. They constitute:

- (a) marketable securities representing claims on or guaranteed by sovereigns, central banks, PSEs or multilateral development banks that satisfy all of the following conditions:
  - (i) they are assigned a 20% risk weight under the standardised approach to credit risk;
  - (ii) they are traded in large, deep and active repo or cash markets characterised by a low level of concentration;
  - (iii) they have a proven record as a reliable source of liquidity in the markets (through repo or outright sale) even during stressed market conditions (i.e. a maximum decline of price not exceeding 10% or increase in haircut not exceeding 10 percentage points over a 30-day period during a relevant period of significant liquidity stress); and
  - (iv) they are not an obligation of a financial institution or any of its affiliated entities,
- (b) corporate debt securities (including commercial paper) and covered bonds that satisfy all of the following conditions:
  - (i) in the case of corporate debt securities: they are not issued by a financial institution or any of its affiliated entities;
  - (ii) in the case of covered bonds: they are not issued by the bank itself or by any of its affiliated entities;
  - (iii) they either: (i) have a long-term credit rating from a recognised external credit assessment institution (ECAI) of at least AA- or in the absence of a long-term rating, a short-term rating equivalent in quality to the long-term rating; or (ii) do not have a credit assessment by a recognised ECAI but are internally rated as having a probability of default (PD) corresponding to a credit rating of at least AA-;
  - (iv) they are traded in large, deep and active repo or cash markets characterised by a low level of concentration; and
  - (v) they have a proven record as a reliable source of liquidity in the markets (through repo or outright sale) even during stressed market conditions i.e. a maximum decline of price or increase in



haircut over a 30-day period during a relevant period of significant liquidity stress not exceeding 10%<sup>2018</sup>.

- 16.4.25 Curiously, the definition of Level 2 assets does not contain an alternative to external ratings for jurisdictions that do not permit the use of external ratings *and* do not apply the internal ratings-based approach to calculate credit risk. Maybe there are no such banks.

#### *Level 2B assets*

- 16.4.26 The admissibility of some or all of level 2B assets is a matter of national discretion. Inclusion is capped at 15% of HQLA and different haircuts apply in accordance with the asset class. Level 2B assets are limited to the following:

- (a) residential mortgage backed securities (RMBS) that satisfy all of the following conditions, subject to a 25% haircut:
  - (i) they are not issued by, and the underlying assets have not been originated by, the bank itself or any of its affiliated entities;
  - (ii) they have a long-term credit rating from a recognised ECAI of AA or higher, or in the absence of a long-term rating, a short-term rating equivalent in quality to the long-term rating;
  - (iii) they are traded in large, deep and active repo or cash markets characterised by a low level of concentration;
  - (iv) they have a proven record as a reliable source of liquidity in the markets (through repo or outright sale) even during stressed market conditions, i.e. a maximum decline of prices not exceeding 20%, or an increase in haircuts over a 30-day period not exceeding 20 percentage points during a relevant period of significant liquidity stress;
  - (v) the underlying asset pools are restricted to residential mortgages and cannot contain structured products;
  - (vi) the underlying mortgages are “full recourse” loans (i.e. in the case of foreclosure the mortgage owner remains liable for any shortfall/sale) and have a maximum loan-to-value ratio (LTV) of 80% on average at issuance; and
  - (vii) the securitisations are subject to “risk retention” regulations which require issuers to retain an interest in the assets they securitise;
- (b) corporate debt securities (including commercial paper) that satisfy all of the following conditions may be included in Level 2B, subject to a 50% haircut:
  - (i) they are not issued by a financial institution or any of its affiliated entities;

- (ii) they either: (i) have a long-term credit rating from a recognised ECAI of at least BBB- or in the absence of a long-term rating, a short-term rating equivalent in quality to the long-term rating; or (ii) do not have a credit assessment by a recognised ECAI but are internally rated as having a PD corresponding to a credit rating of at least BBB-;
  - (iii) they are traded in large, deep and active repo or cash markets characterised by a low level of concentration; and
  - (iv) they have a proven record as a reliable source of liquidity in the markets (through repo or outright sale) even during stressed market conditions i.e. a maximum decline of price not exceeding 20%, or increase in haircuts over a 30-day period not exceeding 20 percentage points during a relevant period of significant liquidity stress; and
- (c) common equity shares that satisfy all of the following conditions may be included in Level 2B, subject to a 50% haircut:
- (i) they are not issued by a financial institution or any of its affiliated entities;
  - (ii) they are exchange-traded and centrally cleared;
  - (iii) they are a constituent of a major stock index (or indices) in the home jurisdiction where the liquidity risk is taken, as decided by the supervisor in the jurisdiction where the index is located;
  - (iv) they are denominated in the domestic currency of the bank's home jurisdiction, or in the currency of the jurisdiction where a bank's liquidity risk is taken;
  - (v) they are traded in large, deep and active repo or cash markets characterised by a low level of concentration; and
  - (vi) they have a proven record as a reliable source of liquidity in the markets (through repo or outright sale) even during stressed market conditions i.e. a maximum decline of prices not exceeding 40%, or increase in haircuts over a 30-day period not exceeding 40 percentage points during a relevant period of significant liquidity stress<sup>2019</sup>.

16.4.27 In addition, supervisors may choose to include within Level 2B assets the undrawn value of any contractually committed liquidity facility (CLF) provided by a central bank, where this has not already been included in HQLA. When including such facilities within Level 2B assets, the following conditions apply:

- (a) the facility (termed a restricted-use committed liquidity facility, or RCLF) must, in normal times, be subject to a commitment fee on the total (drawn and undrawn) facility amount that is at least the greater of:
  - (i) 75 basis points per annum; or

- (ii) at least 25 basis points per annum above the difference in yield on the assets used to secure the RCLF and the yield on a representative portfolio of HQLA after adjusting for any material differences in credit risk; and
- (b) in periods of market-wide stress the commitment fee on the RCLF (drawn and undrawn amount) may be reduced, but remain subject to the minimum requirements applicable to CLFs used by countries with insufficient HQLA;
- (c) the RCLF must be supported by unencumbered collateral of a type specified by the central bank. The collateral must be held in a form which supports immediate transfer to the central bank should the facility need to be drawn and sufficient (post-haircut) collateral is provided to cover the total size of the facility. Collateral used to support a RCLF cannot simultaneously be used as part of HQLA;
- (d) use of the facility is conditional on the bank being assessed to be solvent. The RCLF contract must otherwise be irrevocable prior to maturity and involve no other ex post credit decision by the central bank. The commitment period must exceed the 30-day stress period stipulated by the LCR framework; and
- (e) central banks that offer RCLFs to banks in their jurisdiction should disclose their intention to do so and, to the extent that facilities are not available to all banks in the jurisdiction, to which class(es) of banks they may be offered. National authorities should also disclose whether RCLFs (offered domestically, or by central banks in other jurisdictions) are able to be included within the HQLA of banks within their jurisdiction. National authorities should disclose when they consider there to be a market-wide stress that justifies an easing of the RCLF terms<sup>2020</sup>.

#### *Shari'a compliant banks*

16.4.28 Shari'a compliant banks are prohibited from holding certain types of assets, such as interest-bearing debt securities. Even in jurisdictions that have a sufficient supply of HQLA, an impediment to the ability of Shari'a compliant banks to meet the LCR requirement may therefore exist. In such cases, national supervisors in jurisdictions in which Shari'a compliant banks operate have the discretion to define Shari'a compliant financial products (such as Sukuk) as an alternative HQLA applicable to such banks only, subject to such conditions or haircuts that the supervisors may require<sup>2021</sup>.

## **16.5 Alternative Approaches to HQLA with Insufficient HQLA**

16.5.1 According to the Basel Committee, “[s]ome jurisdictions may have an insufficient supply of Level 1 high-quality liquid assets (HQLA), or both Level 1 and Level 2 HQLA, in their domestic currency, to meet the aggregate demand of banks with significant exposures in this currency. To address this situation, the Basel Committee has developed alternative treatments for holdings in the stock of HQLA, which are expected to apply to a limited number of currencies and jurisdictions”<sup>2022</sup>. Insufficiency of only Level 2 assets is not sufficient<sup>2023</sup>. There are three alternatives available:

- (a) contractual committed liquidity facilities from the central bank;
- (b) foreign country HQLA to cover domestic liquidity needs; and
- (c) additional use of Level 2 assets with a higher haircut<sup>2024</sup>.

16.5.2 National supervisors are not restricted to one of the above three choices. However “the usage of any of the above options must be constrained by a limit specified by supervisors in jurisdictions whose currency is eligible for the alternative treatment. The limit should be expressed in terms of the maximum amount of HQLA associated with the use of the options (whether individually or in combination) that a bank is allowed to include in its Liquidity Coverage Ratio (LCR), as a percentage of the total amount of HQLA the bank is required to hold in the currency concerned”<sup>2025</sup>. The maximum level of usage should be consistent with the projected size of the HQLA shortfall in the currency concerned”<sup>2026</sup>. Banks must also inform their supervisors of the use of the options to enable the supervisor to manage the aggregate usage of the options<sup>2027</sup>.

16.5.3 Bank-by-bank approval of the use of the options is not required, although in the case of central bank committed facilities the central bank would need to approve the facility<sup>2028</sup>. Further, the Basel Committee states:

“A bank must demonstrate that it has taken reasonable steps to use Level 1 and Level 2 assets and reduce the amount of liquidity risk (as measured by reducing net cash outflows in the LCR) to improve its LCR, before applying an alternative treatment. Holding an HQLA portfolio is not the only way to mitigate a bank’s liquidity risk. For example, a bank could improve the matching of its assets and liabilities, attract stable funding sources, or reduce its longer-term assets. Banks should not treat the use of the options simply as an economic choice that maximises the profits of the bank through the selection of alternative HQLA based primarily on yield considerations”<sup>2029</sup>.

16.5.4 We proceed to consider the options in some more detail.

#### *Contractual committed liquidity facilities from the relevant central bank*

16.5.5 According to the Committee:

“Under Option 1, banks may access contractual committed liquidity facilities provided by the relevant central bank (ie relevant given the currency in question) for a fee. These committed liquidity facilities should be distinct and separate from regular central bank standing arrangements, as these committed liquidity facilities must meet certain criteria. In particular, these facilities must be established contractual arrangements between the central bank and the commercial bank with a maturity date which, at a minimum, falls outside the 30-day LCR window. Further, the contract must be irrevocable prior to maturity and must not involve an ex post credit decision by the central bank. Such facilities must also incur a fee for the facility which is charged regardless of the amount, if any, drawn down against that facility; and the fee must be set so that both banks that claim the facility to meet the LCR and banks that do not have similar financial incentives to reduce their exposure to liquidity risk. That is, the fee should be set so that the net yield

on the assets used to secure the facility should not be higher than the net yield on a representative portfolio of Level 1 and Level 2 assets”<sup>2030</sup>.

#### *Foreign currency*

##### 16.5.6 The Basel Committee explains:

“supervisors may permit banks that evidence a shortfall of HQLA in the domestic currency (ie insufficient domestic currency HQLA relative to domestic currency liquidity risk) to hold HQLA in a currency that does not match the currency of the associated liquidity risk. However, the resulting currency mismatch positions must be justifiable and controlled within limits agreed by their supervisors. Supervisors should restrict such positions within levels consistent with the bank’s foreign exchange risk management capacity and needs and ensure that such positions relate to currencies that are freely and reliably convertible, are effectively managed by the bank, and would not pose undue risk to its financial strength. In managing those positions, the bank should take into account the risk that its ability to swap currencies and its access to the relevant foreign exchange markets may erode rapidly under stressed conditions. It should also take into account that sudden, adverse exchange rate movements could sharply widen existing mismatch positions and alter the effectiveness of any foreign exchange hedges in place”<sup>2031</sup>.

16.5.7 Such liquid assets are subject to a minimum haircut of 8% for major currencies that are active in global foreign exchange markets. For other currencies, jurisdictions should increase the haircut to an appropriate level on the basis of historical (monthly) exchange rate volatilities between the currency pair over an extended period of time<sup>2032</sup>. According to a 2019 BIS report, the only currencies with an average market turnover of 10% of global FX turnover (which is the Basel III definition<sup>2033</sup>) are the US dollar, the euro, the Yen and the pound sterling. The maximum haircut for other currencies is 25%<sup>2034</sup>. Specified requirements apply for the use of this option<sup>2035</sup>.

#### *Additional use of level 2 assets with a higher haircut*

##### 16.5.8 The Committee states:

“This option addresses currencies for which there are insufficient Level 1 assets, as determined by reference to the qualifying principles and criteria, but where there are sufficient Level 2A assets. Under this option, supervisors may permit banks that evidence a shortfall of HQLA in the domestic currency (ie relative to domestic currency liquidity risk) to hold additional Level 2A assets in the stock of HQLA. These additional Level 2A assets must be subject to a minimum haircut of 20%, i.e. 5% higher than the 15% haircut applicable to Level 2A assets that are included in the 40% cap. The higher haircut should cover any additional price and market liquidity risks arising from increased holdings of Level 2A assets beyond the 40% cap and provide a disincentive for banks to use this option based on yield considerations. Supervisors must conduct an analysis to assess whether the additional haircut is sufficient for Level 2A assets in their markets, and should increase the haircut if this is warranted to achieve the purpose for which it is intended”<sup>2036</sup>.

- 16.5.9 Banks applying this option must be able to manage the price risk associated with additional level 2A assets, including the value of the assets in a stressed situation<sup>2037</sup>. Also, the bank must be able to show that it can liquidate the additional Level 2A assets in a stress scenario. Possibly supervisory actions to ensure this are stated to include:
- (a) requiring that Level 2A assets that exceed the 40% cap meet higher qualifying criteria (e.g. minimum credit rating of AA+ or AA instead of AA- , are central bank eligible);
  - (b) setting a limit on the minimum issue size of the Level 2A assets that qualify for use under this option;
  - (c) setting a limit on the bank's maximum holding as a percentage of the issue size of the qualifying Level 2A asset;
  - (d) setting a limit on the maximum bid-ask spread, minimum volume, or minimum turnover of the qualifying Level 2A asset; and
  - (e) any other criteria appropriate for the jurisdiction<sup>2038</sup>.

*Principles for assessing eligibility for alternative liquidity approaches*

16.5.10 The Basel Committee have set the following principles as a condition for a jurisdiction to qualify for an alternative treatment. As the decision to allow alternative treatments is reserved to national banking supervisors that are members of the Basel Committee, it is in effect a standard applicable to regulators and not banks that cannot police the application by their regulators of Basel requirements. There are three principles, together with published guidance on meeting the three principles. As these principles are not directed at banks they will be considered briefly.

- (a) **First principle.** To use the alternative treatment under the LCR, a jurisdiction must demonstrate and justify that insufficient HQLA denominated in the domestic currency exists, taking into account all relevant factors affecting the supply of, and demand for, such HQLA. The supply of HQLA in the domestic currency of the jurisdiction must be insufficient, in terms of Level 1 assets only or both Level 1 and Level 2 assets, to meet the aggregate demand for such assets from banks operating in that currency.

The determination of insufficient HQLA by the jurisdiction should address all major factors relevant to the issue. These include, but are not limited to, the expected supply of HQLA in the medium term (e.g. three to five years), the extent to which the banking sector can and should run less liquidity risk, and the competing demand from banks and non-bank investors for holding HQLA for similar or other purposes.

Insufficient HQLA faced by the jurisdiction must be caused by structural, policy and other constraints that cannot be resolved within the medium term. Such constraints may relate to the fiscal or budget policies of the jurisdiction, the infrastructural development of its capital markets, the structure of its monetary system and operations (e.g. the currency board

arrangements for jurisdictions with pegged exchange rates), or other jurisdiction-specific factors leading to the shortage or imbalance in the supply of HQLA available to the banking sector<sup>2039</sup>.

- (b) **Second Principle.** A jurisdiction that intends to adopt one or more of the options for alternative treatment must be capable of limiting the uncertainty of performance, or mitigating the risks of non-performance, of the option(s) concerned. For the provision of contractually committed liquidity facilities from the relevant central bank, the jurisdiction must have the economic strength to support the committed liquidity facilities granted by its central bank. To ensure this, the jurisdiction should have a process in place to control the aggregate amount of such facilities within a level that can be measured and managed.

In the case of the use of foreign currency HQLA to cover domestic currency liquidity needs, the jurisdiction must have a mechanism in place to control the foreign exchange risk of its banks' foreign currency HQLA holdings.

Where Level 2A assets are used beyond the 40% cap with a higher haircut, the jurisdiction must only allow Level 2 assets that are of a quality (credit and liquidity) comparable to that for Level 1 assets in its currency to be used under this option. The jurisdiction should be able to provide quantitative and qualitative evidence to substantiate this requirement<sup>2040</sup>.

- (c) **Third Principle.** A jurisdiction that intends to adopt one or more of the options for alternative treatment must be committed to observing all of the obligations set out in Basel III. The jurisdiction must maintain a supervisory monitoring system to ensure that its banks comply with the rules and requirements relevant to their usage of the options, including any associated haircuts, limits or restrictions.

The jurisdiction must document and update its approach to adopting an alternative treatment, and make the approach explicit and transparent to other national supervisors. The approach should address how it complies with the applicable criteria, limits and obligations set out in the qualifying principles, including the determination of insufficient HQLA and other key aspects of its framework for alternative treatment.

The jurisdiction must review periodically the determination of insufficient HQLA at intervals not exceeding five years, and disclose the results of review and any consequential changes to other national supervisors and stakeholders.

The jurisdiction must permit an independent peer review of its framework for alternative treatment to be conducted as part of the Basel Committee's work programme and address the comments made<sup>2041</sup>.

## 16.6 Cash Inflows and Cash Outflows

- 16.6.1 The denominator of the LCR is the total net cash outflows over the defined 30 day horizon. This requires a definition of inflows and outflows. As has been

mentioned above, these are supervisory estimates and not actual inflows and outflows a bank experienced during a selected stress period. The Basel Committee states:

“The term total net cash outflows is defined as the total expected cash outflows minus total expected cash inflows in the specified stress scenario for the subsequent 30 calendar days. Total expected cash outflows are calculated by multiplying the outstanding balances of various categories or types of liabilities and off-balance sheet commitments by the rates at which they are expected to run off or be drawn down. Total expected cash inflows are calculated by multiplying the outstanding balances of various categories of contractual receivables by the rates at which they are expected to flow in under the scenario up to an aggregate cap of 75% of total expected cash outflows”<sup>2042</sup>.

16.6.2 This can be expressed as follows<sup>2043</sup>:

$$\begin{aligned} & \textit{Total net cash outflows over the next 30 days} \\ & = \textit{Total expected cash outflows} \\ & - \textit{min (Total expected cash inflows, 75\% of total expected cash outflows)} \end{aligned}$$

#### Cash outflows

16.6.3 We will first examine cash outflows before considering cash inflows. For each class a percentage of between 3% and 100% of the position is assumed to be withdrawn in the event of a liquidity stress.

16.6.4 **Retail deposits.** These are deposits placed with a bank by a natural person. Deposits from legal entities, sole proprietorships or partnerships are captured under the category of wholesale deposits<sup>2044</sup>. Deposits pledged as collateral to the bank to secure a facility or loan that will not mature or be settled within 30 days may be ignored from the LCR<sup>2045</sup>. Retail deposits are divided into stable and less stable deposits. The run-off rates are minima and may be increased at national discretion by supervisors<sup>2046</sup>.

16.6.5 Stable deposits are deposits that are fully insured by an effective deposit insurance scheme or by a public guarantee that provides equivalent protection where:

- (a) the depositor has other established relationships with the bank that make withdrawal of the deposit highly unlikely; or
- (b) the deposits are in transactional accounts (e.g. accounts where salaries are automatically deposited)<sup>2047</sup>.

16.6.6 Where the size of the deposit exceeds the insured limit, that part which is insured is treated as stable, and the excess less stable<sup>2048</sup>.

16.6.7 An “effective deposit insurance scheme” is defined as a scheme:

- (a) that guarantees that it has the ability to make prompt payouts;



- (b) for which the coverage is clearly defined;
  - (c) of which public awareness is high; and
  - (d) in which the deposit insurer has formal legal powers to fulfil its mandate and is operationally independent, transparent and accountable<sup>2049</sup>.
- 16.6.8 Direct sovereign guarantees that function as a deposit insurance scheme may also be regarded as compliant<sup>2050</sup>.
- 16.6.9 It does not seem that the deposit insurance scheme needs to be capable of meeting all demands in a financial crisis to be “effective” as the criteria do not require a sovereign guarantee of the scheme. In the Icelandic financial crisis in 2008 all the largest Icelandic banks failed. The national deposit insurance fund was clearly incapable of meeting all potential claims, and the Icelandic state declined to bail out the fund as this would probably have precipitated a sovereign default. Ireland, which in 2008 *did* guarantee all deposits without limit itself required a bail-out from the IMF, the European Financial Stability Mechanism and the European Financial Stability Fund when losses at its banks resulted in Ireland losing market access for new sovereign debt.
- 16.6.10 The assumed run-off rate for stable deposits is 5%<sup>2051</sup>.
- 16.6.11 However, jurisdictions may set a run-off rate of 3% to stable deposits in their jurisdiction that meet the above criteria and additionally:
- (a) the insurance scheme is based on prefunding via the periodic collection of levies on banks with insured deposits;
  - (b) the scheme has adequate means of ensuring ready access to additional funding in the event of a large call on its reserves, e.g. a government guarantee or standing authority to borrow from the government or central bank; and
  - (c) access to insured deposits is available to depositors within a period typically no more than seven business days<sup>2052</sup>.
- 16.6.12 Supervisors applying the 3% run-off rate should provide evidence of run-off rates for stable deposits within the banking system below 3% during any period of stress consistent with that presupposed by the LCR. Clearly there were episodes during the Eurozone crisis in certain countries where outflows exceeded 3% or 5%. However, they were mainly triggered by fears of sovereign default or countries leaving the euro, such as Greece in 2015. These exceptional circumstances do not appear to be captured by the assumed liquidity stress underlying the LCR.
- 16.6.13 These additional criteria do not seem to require full government backing of insured retail deposits in a crisis as “ready access to additional funding” is not the same as “ready access to all required funding”, although national supervisors may go beyond the Basel requirements, or set a higher run-off.

- 16.6.14 All retail deposits that do not fall with the definitions of “stable” are treated as less stable. The assumed run-off rate is 10%<sup>2053</sup>. However, national supervisors may set higher run-off rates for more risky deposits. According to the Committee:

“Supervisory authorities should develop additional buckets with higher run-off rates as necessary to apply to buckets of potentially less stable retail deposits in their jurisdictions, with a minimum run-off rate of 10%. ... Buckets of less stable deposits may include deposits that are not fully covered by an effective deposit insurance scheme or sovereign deposit guarantee, high-value deposits, deposits from sophisticated or high net worth individuals, deposits that can be withdrawn quickly (eg internet deposits) and foreign currency deposits, as determined by each jurisdiction”<sup>2054</sup>.

- 16.6.15 Foreign currency deposits are considered less stable if the bank has reason to believe that such deposits are more volatile than domestic currency deposits. Factors affecting the volatility of foreign currency deposits include the type and sophistication of the depositors, and the nature of such deposits<sup>2055</sup>. Clearly, a case-by-case approach is warranted.
- 16.6.16 Term deposits that cannot be withdrawn within 30 days, or where the break fee is materially greater than the interest foregone, are disregarded<sup>2056</sup>.

#### *Unsecured wholesale funding*

- 16.6.17 Unsecured wholesale funding is defined as those liabilities and general obligations that are raised from non-natural persons (i.e. legal entities, sole proprietorships and partnerships) and are not collateralised by legal rights to specifically designated assets owned by the borrowing institution in the case of bankruptcy, insolvency, liquidation or resolution. Derivative exposures are also carved out<sup>2057</sup>.
- 16.6.18 The wholesale funding included in the LCR is defined as all funding that is callable within the LCR’s time horizon of 30 days, or that has its earliest possible contractual maturity date situated within this horizon (such as maturing term deposits and unsecured debt securities), as well as funding with an undetermined maturity. This should include all funding with options that are exercisable at an investor’s discretion within the 30 calendar day horizon. For funding with options exercisable at the bank’s discretion, supervisors should take into account reputational factors that may limit a bank’s ability not to exercise the option. In particular, where the market expects certain liabilities to be redeemed before their legal final maturity date, banks and supervisors should assume such behaviour for the purpose of the LCR and include these liabilities as outflows<sup>2058</sup>.
- 16.6.19 The treatment of outflows varies depending on whether the deposit is made by small business customers or larger corporates.

#### *Small business customers*

- 16.6.20 This category consists of deposits and other funds extended by non-financial small business customers. This bears the same definition as in the IRB approach to credit risk<sup>2059</sup>. In summary, the loan must be originated in the

same manner as a retail exposure, must not be individually managed, and the total exposure must be less than € 1 million<sup>2060</sup>. In this case, as it is a deposit the € 1 million figure applies to that deposit<sup>2061</sup>. It is not clear what role “managing” means with regard to the deposit as deposits are normally repayable either on demand or after an agreed term<sup>2062</sup>. The € 1 million figure is a gross amount and no netting is recognised in respect of any credit extended to small businesses. Securities deposits and derivatives with the bank are included within the cap<sup>2063</sup>.

- 16.6.21 Small business wholesale funding is, like retail deposits, separated into “stable” and “less stable” funding. The same definitions and run-off factors apply. Stable small business deposits attract a 10% run-off (there is no option to use a 3% run-off). Less stable funding attracts a 10% run-off (or a higher figure in the circumstances applicable to retail deposits)<sup>2064</sup>.

#### *Other corporates*

- 16.6.22 This category comprises all deposits and other extensions of unsecured funding from non-financial corporate customers that are not treated as small businesses
- 16.6.23 The assumed run-off is 40%<sup>2065</sup>. A 25% run-off may apply to certain operational deposits - see below.
- 16.6.24 However, a 20% run-off applies to funding provided without operational relationships if the entire amount of the deposit is covered by a fully effective deposit insurance scheme or public guarantee providing equivalent protection<sup>2066</sup>.

#### *Operational deposits generated by clearing, custody and cash management activities*

- 16.6.25 Certain activities may result in financial and non-financial customers needing to place, or leave, deposits with a bank in order to facilitate their access and ability to use payment and settlement systems and otherwise make payments. Prime brokerage and correspondent banking exposures are excluded from this treatment<sup>2067</sup>.
- 16.6.26 These funds receive a 25% run-off factor if the customer has a substantive dependency with the bank and the deposit is required for such activities.
- 16.6.27 Supervisory approval should be given to ensure that banks utilising this treatment actually are conducting these operational activities at the level indicated. Supervisors may also choose not to permit banks to utilise the operational deposit run-off rate in cases where, for example, a significant portion of operational deposits are provided by a small proportion of customers (i.e. there is concentration risk)<sup>2068</sup>.
- 16.6.28 Qualifying activities mean clearing, custody or cash management activities. The following criteria apply:
- (a) the customer is reliant on the bank to perform these services (so the treatment is inapplicable if the bank knows that the customer has an adequate backup service provider);

- (b) the services are provided under a legally binding agreement to institutional customers; and
  - (c) the arrangements cannot be terminated on less than 30 days' notice, or the customer would incur significant switching costs in doing so within 30 days<sup>2069</sup>.
- 16.6.29 Deposits generated by such activity are deemed to be qualifying operational deposits where the following two criteria are met:
  - (a) the deposit is a by-product of the underlying service provided by the bank; and<sup>2070</sup>
  - (b) the deposit is held in a specifically designated account and priced without giving an economic incentive to the customer to leave excess funds in the account. If interest rates are close to zero, then the deposit should not bear interest.
- 16.6.30 Further, only that portion of the balance that is needed to fulfil clearing, cash management and custody activities qualifies for a 25% run-off. Any excess balances are subject to the appropriate treatment for other balances. This requires the bank to determine the operational balance required and to exclude any excess from the 25% assumed run-off. If a bank is unable to calculate this amount then the entire deposit is treated as being non-operational<sup>2071</sup>. Additional standards are intended to assist banks in determining which activities may generate operational deposits<sup>2072</sup>.
- 16.6.31 **Unsecured funding provided by sovereigns, central banks, multilateral development banks and public sector entities.** This treatment applies to all such funding that does not meet the criteria for operational deposits.
- 16.6.32 The run-off figures are exactly the same as for non-small business corporates i.e. 40% normally, but 20% if fully covered by an effective deposit insurance scheme or a public guarantee<sup>2073</sup>. Why a bank should be able to reduce the run-off on a sovereign deposit by procuring a guarantee from the central bank or other governmental body does not seem to make sense. Presumably<sup>2074</sup>, sovereigns do not provide such guarantees of their own performance.
- 16.6.33 **Institutional networks of co-operative banks.** An institutional network of cooperative banks is a group of legally autonomous banks with a statutory framework of co-operation with a common strategic focus and brand where specific functions are performed by central institutions or specialised service providers. So long as both the bank that has received the monies and the bank that has deposited participate in the same institutional network's mutual protection scheme against illiquidity and insolvency of its members, a 25% run-off rate may be given to the amount of deposits of member institutions with the central institution or specialised central service providers that are placed: (1) due to statutory minimum deposit requirements, which are registered at regulators; or (2) in the context of common task sharing and legal, statutory or contractual arrangements.
- 16.6.34 **Unsecured wholesale funding provided by other legal entities.** This category consists of all deposits and other funding from other institutions

(including banks, securities firms, insurance companies, etc.), fiduciaries, asset managers, beneficiaries, conduits and special purpose vehicles, affiliated entities of the bank and other entities that are not specifically held for operational purposes (as defined above) and not included in the prior categories.

- 16.6.35 All notes, bonds and other debt securities issued by the bank must be included in this category regardless of the holder, unless the bond is sold exclusively in the retail market and held in retail accounts (including small business customer accounts treated as retail), in which case the instruments may be treated in the appropriate retail or small business customer deposit category. The securities must be legally restricted to being held by persons other than natural persons or small businesses<sup>2075</sup>.
- 16.6.36 The run-off factor for these funds is 100%. The rationale is that in a liquidity stress, all such deposits would be withdrawn.

#### *Secured funding run-off*

- 16.6.37 So far we have been concerned solely with unsecured transactions. Funding is considered to be secured if “those liabilities and general obligations ... are collateralised by legal rights to specifically designated assets owned by the borrowing institution in the case of bankruptcy, insolvency, liquidation or resolution. Unless the counterparty is a central bank, secured funding does not include transactions collateralised by assets that are not tradable in financial markets such as property, plant and equipment”<sup>2076</sup>.
- 16.6.38 In the event of a loss of secured funding on short-term financing transactions, the ability to continue to transact repurchase, reverse repurchase and other securities financing transactions is limited to transactions backed by HQLA, or with the bank’s domestic sovereign, PSE or central bank. Collateral swaps are treated as repurchase or reverse repurchase agreements, as are any other transaction with a similar form. Additionally, collateral lent to the bank’s customers to effect short positions is treated as a form of secured funding<sup>2077</sup>.
- 16.6.39 Due to the high quality of Level 1 assets, no reduction in funding availability against these assets is assumed to occur. Moreover, no reduction in funding availability is expected for any maturing secured funding transactions with the bank’s domestic central bank.
- 16.6.40 A reduction in funding availability is assigned to maturing transactions backed by Level 2 assets equivalent to the required haircuts discussed earlier. A 25% factor may be applied for maturing secured funding transactions with the bank’s domestic sovereign, multilateral development banks, or domestic PSEs that have a 20% or lower risk weight under the standardised approach, when the transactions are backed by assets other than Level 1 or Level 2A assets, in recognition of the fact that these entities are unlikely to withdraw secured funding from banks in a time of market-wide stress. This treatment, however, may be applied only to outstanding secured funding transactions<sup>2078</sup>.
- 16.6.41 For all other maturing transactions the run-off factor is 100%, including transactions where a bank has satisfied customers’ short positions with its own long positions. All secured transactions maturing within 30 days should be

reported according to the collateral actually pledged as of close of business on the LCR measurement date. If the bank pledges a pool of assets and cannot determine which specific assets in the collateral pool are used to collateralise the transactions with a residual maturity greater than 30 days, it may assume that assets are encumbered to these transactions in order of increasing liquidity value, in such a way that assets with the lowest liquidity value in the LCR are assigned to the transactions with the longest residual maturities first<sup>2079</sup>.

- 16.6.42 The table below summarises the outflow applicable to transactions maturing within 30 days<sup>2080</sup>.

Categories for outstanding secured funding maturing transactions	Amount to add to cash out-flows
Backed by Level 1 assets or with central banks	0%
Backed by Level 2A assets	15%
Secured funding transactions with domestic sovereign, PSEs or multilateral development banks that are not backed by Level 1 or Level 2A assets	25%
Backed by residential mortgage-backed securities (RMBS) eligible for inclusion in Level 2B	25%
Backed by other Level 2B assets	50%
All other assets	100%

#### *Outflows on derivative instruments*

- 16.6.43 The sum of all net derivative cash outflows receive a 100% out flow factor. The rules for derivatives do not apply to securities funding transactions<sup>2081</sup>.
- 16.6.44 Banks are required to calculate, in accordance with their existing valuation methodologies, expected contractual derivative cash inflows and outflows. Such cash flows may be calculated on a net basis (i.e. inflows can offset outflows) on a counterparty-by-counterparty basis only where a valid master netting agreement exists. Banks must exclude from such calculations liquidity requirements that would result from increased collateral needs due to market value movements, or declines in value of any collateral posted.
- 16.6.45 Options that can be exercised within the next 30 days, including options that expire in greater than 30 days (e.g. an American-style option<sup>2082</sup>), are assumed to be exercised when they are “in the money” for the option buyer. For transactions involving a delivery obligation that can be fulfilled with a variety of asset classes, delivery of the least valuable asset possible (“cheapest to deliver”) is assumed. This applies symmetrically to both the inflows and outflows, such that the obligor is assumed to deliver the security with the lowest liquidity value. Cash flows arising from foreign exchange derivative

transactions that involve a full exchange of principal amounts on a simultaneous basis (or within the same day) can be reflected as a net cash flow figure, even where those transactions are not covered by a master netting agreement<sup>2083</sup>.

- 16.6.46 Where derivative payments are collateralised by HQLA, cash outflows are calculated net of any corresponding cash or collateral inflows that would result from contractual obligations for cash or collateral provided to the bank, if the bank is legally entitled and operationally capable to re-use the collateral in new cash raising transactions once the collateral is received this is recognised<sup>2084</sup>.
- 16.6.47 If a bank is required to provide additional collateral in response to a credit rating downgrade then a 100% outflow applies. That is 100% of the amount of collateral that would be posted for, or contractual cash outflows associated with, any downgrade up to and including a 3-notch downgrade. Often, derivatives contracts and other transactions have clauses that require the posting of additional collateral, the drawdown of contingent facilities, or the early repayment of existing liabilities upon the bank's downgrade. Triggers linked to a bank's short-term rating should be assumed to be triggered at the corresponding long-term rating in accordance with published ratings criteria<sup>2085</sup>.
- 16.6.48 Banks must calculate possible outflows from changes in the valuation of posted collateral (i.e. the collateral becoming less valuable). The rules are as follows. Increased liquidity needs related to the potential for valuation changes on posted collateral securing derivative and other transactions attract an outflow of 20% of the value of non-Level 1 posted collateral.
- 16.6.49 The Basel Committee state that most counterparties to derivatives transactions typically secure the mark-to-market valuation of their positions predominantly through cash or sovereign, central bank, multilateral development bank, or PSE debt securities with a 0% risk weight under the standardised approach to credit risk. When these Level 1 liquid asset securities are posted as collateral, the LCR framework does not require that an additional stock of HQLA be maintained for potential valuation changes.
- 16.6.50 If, however, counterparties are securing mark-to-market exposures with other forms of collateral, to cover the potential loss of market value, 20% of the value of all such posted collateral, net of collateral received on a counterparty-by-counterparty basis (provided that the collateral received is not subject to restrictions on re-use or re-hypothecation) is added to the stock of required HQLA. This 20% figure is calculated based on the notional amount required to be posted as collateral after any other haircuts have been applied that may be applicable to the collateral category. Any collateral that is in a segregated margin account may only be used to offset outflows that are associated with payments that are eligible to be offset from that same account. No other form of netting is permissible when calculating this outflow amount<sup>2086</sup>. Nor can the same collateral be netted across different counterparties<sup>2087</sup>.
- 16.6.51 Guidance states that the rules on derivatives apply to all derivatives, whether on-exchange or OTC, and whether centrally cleared or not<sup>2088</sup>.

- 16.6.52 Where a counterparty has a right to repayment of excess collateral held then a 100% out-flow is presumed<sup>2089</sup>.
- 16.6.53 Some derivative contracts allow the substitution of HQLA collateral with HQLA collateral of a lower quality, or non-HQLA collateral without the bank's consent. In this case the following treatment applies. Where HQLA collateral can be substituted with non HQLA collateral then a 100% out-flow applies. Where HQLA collateral can be substituted with HQLA collateral of a lower liquidity quality, the outflow is measured based on the difference between the LCR haircuts of the existing and the potentially substitute collateral. If these have different liquidity values then the lowest liquidity value is used<sup>2090</sup>.
- 16.6.54 As market practice requires the collateralisation of mark-to-market exposures on derivative and other transactions, banks face potentially substantial liquidity risk exposures to these valuation changes. Inflows and outflows of transactions executed under the same master netting agreement may be treated on a net basis. Any outflow generated by increased needs related to market valuation changes must be included in the LCR calculated by identifying the largest absolute net 30-day collateral flow realised during the preceding 24 months. The absolute net collateral flow is based on both realised outflows and inflows<sup>2091</sup>.
- 16.6.55 The largest absolute net 30-day collateral flow is the largest aggregated cumulative net collateral outflow or inflow at the end of all 30-day periods during the preceding 24 months. For this purpose, banks have to consider all 30-day periods during the preceding 24 months<sup>2092</sup>.

*Asset-backed securities, covered bonds and structured finance*

- 16.6.56 A 100% out-flow applies from the loss of funding on such instruments issued by a bank within the 30-day period. The assumption is that in a liquidity stress it will be impossible to refinance such instruments. This outflow may be offset against HQLA that would become unencumbered and available upon the maturity of the instrument. Any surplus of the liquidity value of HQLA that would become unencumbered over the redemption value for maturing securities may be recognised as an inflow<sup>2093</sup>.

*Asset-backed commercial paper, conduits, securities investment vehicles and other such financing vehicles*

- 16.6.57 A 100% out-flow applies on the assumption that a bank will not be able to refinance such facilities during a liquidity stress. Banks having structured financing facilities that include the issuance of short-term debt instruments, such as asset-backed commercial paper, must consider the potential liquidity risk arising from such structures. These risks include, but are not limited to, the inability to refinance maturing debt, and the existence of derivatives or derivative-like components contractually written into the documentation associated with the structure that would allow the "return" of assets in a financing arrangement, or that require the original asset transferor to provide liquidity, effectively ending the financing arrangement within the 30-day period.



- 16.6.58 Where the structured financing activities of a bank are conducted through a special purpose entity (such as an SPV, conduit or structured investment vehicle), the bank must, in determining the HQLA requirements, look through to the maturity of the debt instruments issued by the entity and any embedded options in financing arrangements that may potentially trigger the “return” of assets or the need for liquidity, irrespective of whether or not the special purpose vehicle is consolidated. 100% of the amount of the assets that could potentially be returned, or the liquidity required, is required to be taken into consideration<sup>2094</sup>.

#### *Credit and liquidity facilities*

- 16.6.59 This refers to committed facilities that are not unconditionally cancellable by the bank. According to the Basel Committee, these off-balance sheet facilities or funding commitments can have long- or short-term maturities, with short-term facilities frequently renewing, or automatically rolling over. In a stressed environment, it is likely to be difficult for customers drawing on facilities of any maturity, including short-term maturities, to be able to quickly pay back these borrowings. Therefore, all facilities that are assumed to be drawn are assumed to remain outstanding without repayment, regardless of maturity<sup>2095</sup>.
- 16.6.60 The currently undrawn portion of such facilities may be calculated net of any HQLA eligible for the stock of HQLA, if the HQLA have already been posted as collateral by the counterparty to secure the facilities or that are contractually obliged to be posted if the counterparty were to draw down the facility (e.g. a liquidity facility structured as a repo), where the bank is legally entitled and operationally capable to re-use the collateral in new cash raising transactions once the facility is drawn, and there is no undue correlation between the probability of drawing the facility and the market value of the collateral<sup>2096</sup>.
- 16.6.61 A “liquidity facility” is defined as “any committed, undrawn backup facility that would be utilised to refinance the debt obligations of a customer in situations where such a customer is unable to rollover that debt in financial markets (e.g. pursuant to a commercial paper programme, secured financing transactions, obligations to redeem units)”. The amount of the commitment that is treated as a liquidity facility is the amount of the currently outstanding debt issued by the customer (or a proportionate share, if it concerns a syndicated facility) maturing within a 30-day period that is backstopped by the facility. The portion of a liquidity facility that is backing debt that does not mature within the 30-day window may be excluded from the scope of the definition of a facility<sup>2097</sup>.
- 16.6.62 The following treatment applies to credit facilities. Any contractual loan drawdowns from committed facilities and estimated drawdowns from revocable facilities within the 30-day period are fully reflected as outflows as follows:
- (a) committed credit and liquidity facilities to retail and small business customers: banks must assume a 5% drawdown of the undrawn portion;

- (b) committed credit facilities to non-financial corporates, sovereigns and central banks, PSEs and multilateral development banks: banks must assume a 10% drawdown of the undrawn portion of these credit facilities;
- (c) committed liquidity facilities to non-financial corporates, sovereigns and central banks, PSEs and multilateral development banks: banks must assume a 30% drawdown of the undrawn portion of these liquidity facilities;
- (d) committed credit and liquidity facilities extended to banks subject to prudential supervision: banks must assume a 40% drawdown of the undrawn portion of these facilities;
- (e) committed credit facilities to other financial institutions, including securities firms, insurance companies, fiduciaries, and beneficiaries: banks must assume a 40% drawdown of the undrawn portion of these credit facilities;
- (f) committed liquidity facilities to other financial institutions, including securities firms, insurance companies' fiduciaries and beneficiaries: banks must assume a 100% drawdown of the undrawn portion of these liquidity facilities; and
- (g) committed credit and liquidity facilities to other legal entities (including SPEs, conduits and special purpose vehicles, and other entities not included in the prior categories): banks must assume a 100% drawdown of the undrawn portion of these facilities<sup>2098</sup>.

16.6.63 Any other committed obligations to extend funds within a 30-day period not otherwise captured are subject to a 100% assumed out flow<sup>2099</sup>. Equally, any other contractual out flows are assigned a 100% figure, such as uncovered short positions, dividends and interest payments. Operating costs are disregarded<sup>2100</sup>.

16.6.64 If the total of all contractual obligations to extend funds to retail and non-financial wholesale counterparties (e.g. including small or medium-sized entities and other corporates, sovereigns, multilateral development banks and PSEs) within the next 30 calendar days (not captured in any of the prior categories) exceeds 50% of the total contractual inflows due in the next 30 calendar days from such counterparties, the difference is reported as a 100% outflow<sup>2101</sup>.

#### *Forward transactions*

16.6.65 The Committee has published the treatment of forward transactions in the form of frequently asked questions (FAQs). Basically, the treatment is as follows.

16.6.66 The following transactions do not have any impact on a bank's LCR and can be ignored:

- (a) forward repos, forward reverse repos and forward collateral swaps that start and mature within the LCR's 30-day horizon;

- (b) forward repos, forward reverse repos and forward collateral swaps that start prior to and mature after the LCR's 30-day horizon; and
  - (c) all forward sales and forward purchases of HQLA.
- 16.6.67 For forward repos, forward reverse repos and forward collateral swaps that start within the 30-day horizon and mature beyond the LCR's 30-day horizon, the treatments are as follows:
- (a) cash outflows from forward reverse repos (with a binding obligation to accept) count towards "other cash outflows" and must be netted against the market value of the collateral received after deducting the haircut applied to the respective assets in the LCR (15% to Level 2A, 25% to RMBS Level 2B assets, and 50% to other Level 2B assets);
  - (b) cash inflows from forward repos are "other contractual inflows" and must be netted against the market value of the collateral extended after deducting the haircut applied to the respective assets in the LCR; and
  - (c) in case of forward collateral swaps, the net amount between the market values of the assets extended and received after deducting the haircuts applied to the respective assets in the LCR counts towards "other contractual outflows" or "other contractual inflows" depending on which amount is higher.
- 16.6.68 Forward repos, forward reverse repos and forward collateral swaps that start previous to and mature within the LCR's 30-day horizon are treated like repos, reverse repos and collateral swaps.
- 16.6.69 HQLA collateral held by a bank on the first day of the LCR horizon may count towards the stock of HQLA even if it is sold or repoed forward.
- 16.6.70 Unsettled sales and purchases of HQLA can be ignored in the LCR. The cash flows arising from sales and purchases of non-HQLA that are executed but not yet settled at the reporting date count towards "other cash inflows" and "other cash outflows".
- 16.6.71 Any outflows or inflows of HQLA in the next 30 days in the context of forward and unsettled transactions are only considered if the assets do or will count toward the bank's stock of HQLA. Outflows and inflows of HQLA-type assets that are or will be excluded from the bank's stock of HQLA due to operational requirements are treated like outflows or inflows of non-HQLA<sup>2102</sup>.

#### *National discretions*

- 16.6.72 Other contingent funding obligations are subject to run-off rates set at national discretion<sup>2103</sup>. According to the Committee, these contingent funding obligations may be either contractual or non-contractual and are not lending commitments. Non-contractual contingent funding obligations include associations with, or sponsorship of, products sold or services provided that may require the support or extension of funds in the future under stressed conditions. Non-contractual obligations may be embedded in financial products and instruments sold, sponsored, or originated by the bank that can

give rise to unplanned balance sheet growth arising from support given for reputational risk considerations. These include products and instruments for which the customer or holder has specific expectations regarding the liquidity and marketability of the product or instrument and for which failure to satisfy customer expectations in a commercially reasonable manner would be likely to cause material reputational damage<sup>2104</sup>.

16.6.73 In the case of contingent funding obligations stemming from trade finance instruments, national authorities may apply a relatively low run-off rate (e.g. 5% or less). Trade finance instruments consist of trade-related obligations directly underpinned by the movement of goods or the provision of services, such as:

- (a) documentary trade letters of credit, documentary and clean collection, import bills, and export bills; and
- (b) guarantees directly related to trade finance obligations, such as shipping guarantees<sup>2105</sup>.

16.6.74 Other contingent outflows, subject to national discretion include:

- (a) unconditionally revocable “uncommitted” credit and liquidity facilities;
- (b) guarantees and letters of credit unrelated to trade finance obligations;
- (c) non-contractual obligations such as:
  - (i) potential requests for debt repurchases of the bank’s own debt or that of related conduits, securities investment vehicles and other such financing facilities;
  - (ii) structured products where customers anticipate ready marketability, such as adjustable rate notes and variable-rate demand notes;
  - (iii) managed funds that are marketed with the objective of maintaining a stable value such as money market mutual funds or other types of stable value collective investment funds etc.; and
- (d) for issuers with an affiliated dealer or market-maker, there may be a need to include an amount of the outstanding debt securities (unsecured and secured, term as well as short-term) having maturities greater than 30 calendar days, to cover the potential repurchase of such outstanding securities; and
- (e) non-contractual obligations where customer short positions are covered by other customers’ collateral: a minimum 50% run-off factor of the contingent obligations is applied where banks have internally matched client assets against other clients’ short positions where the collateral does not qualify as Level 1 or Level 2, and the bank may be obligated to find additional sources of funding for these positions in the event of client withdrawals<sup>2106</sup>.

## 16.7 Cash Inflows

16.7.1 The final part of the LCR is the determination of cash inflows. Remember that the amount of inflows that can offset outflows is capped at 25% so banks must always hold HQLA assets equal to 25% of cash outflows whatever the deemed actual inflow figure is<sup>2107</sup>. The basic rule is that when considering its available cash inflows, a bank must only include contractual inflows (including interest payments) from outstanding exposures that are fully performing and for which the bank has no reason to expect a default within the 30-day time horizon. Contingent inflows, including facilities obtained from a central bank or other party, must not be included in total net cash inflows<sup>2108</sup>.

### *Secured lending, including repo-style transactions*

16.7.2 A bank must assume that maturing reverse repurchase or securities borrowing agreements secured by Level 1 assets will be rolled-over and will not give rise to any cash inflows (0%).

16.7.3 Maturing reverse repurchase or securities lending agreements secured by Level 2 HQLA lead to cash inflows equivalent to the relevant haircut for the specific assets.

16.7.4 A bank is assumed not to roll over maturing reverse repurchase or securities borrowing agreements secured by non-HQLA assets, and may assume to receive back 100% of the cash related to those agreements.

16.7.5 Collateralised loans extended to customers for the purpose of taking leveraged trading positions (“margin loans”) are also considered to be a form of secured lending. However, for this scenario, banks cannot recognise more than 50% of contractual inflows from maturing margin loans made against non-HQLA collateral<sup>2109</sup>.

16.7.6 An exception to this treatment applies, if the collateral obtained through reverse repo, securities borrowing, or collateral swaps, maturing within the 30-day horizon, is re-used (i.e. re-hypothecated) and is used to cover short positions that could be extended beyond 30 days. In this case, a bank is required to assume that such reverse repos or securities borrowing arrangements will be rolled-over and will not give rise to any cash inflows, reflecting its need to continue to cover the short position or to re-purchase the relevant securities. In such cases, the short position must be treated symmetrically and not give rise to any outflows. Short positions are evaluated at the end of the calculation date and the ability to substitute collateral in the transaction creating the short position must not be considered in determining the inflow rate of the secured lending transaction<sup>2110</sup>.

16.7.7 The following table applies<sup>2111</sup>:

Maturing secured lending transaction backed by the following asset category	Inflow rate (if collateral not used to cover short positions)	Inflow rate (if collateral is used to cover short positions)
Level 1 assets	0%	0%
Level 2A assets	15%	0%
Level 2B assets: RMBS	25%	0%
Level 2B assets: other	50%	0%
Margin lending backed by all other collateral	50%	0%
Other collateral	100%	0%

- 16.7.8 In the case of a bank's short positions, if the short position is being covered by an *unsecured* securities borrowing, the bank must assume the unsecured security borrowing of collateral from financial market participants would run-off in full, leading to a 100% outflow of either cash or HQLA to secure the borrowing or cash to close out the short position by buying back the security. This must be recorded as a 100% other contractual outflow. If, however, the bank's short position is being covered by a collateralised securities financing transaction, the bank must assume the short position will be maintained throughout the 30-day period and receive a 0% outflow<sup>2112</sup>.

#### *Committed facilities*

- 16.7.9 No credit facilities, liquidity facilities or other contingent funding facilities that the bank holds at other institutions for its own purposes can be assumed to be able to be drawn. Such facilities receive a 0% inflow rate, meaning that this scenario does not consider inflows from committed credit or liquidity facilities. The purpose is to reduce the contagion risk of liquidity shortages at one bank causing shortages at other banks and to reflect the risk that other banks may not be in a position to honour credit facilities, or may decide to incur the legal and reputational risk involved in not honouring the commitment, in order to conserve their own liquidity or reduce their exposure to that bank<sup>2113</sup>. (Whether this is a reasonable expectation the reader can judge; it is clearly a policy choice).

#### *Inflows from other counterparties*

- 16.7.10 For all other types of transactions, either secured or unsecured, the inflow rate is determined by counterparty. In order to reflect the need for a bank to conduct ongoing loan origination/roll-over with different types of counterparties, even during a time of stress, a set of limits on contractual inflows by counterparty type is applied. Regarding financial institutions, a bank may generally assume a complete return of liquidity from such institutions, provided the funds are not supporting operational activities<sup>2114</sup>.
- 16.7.11 Inflows from loans that have no specific maturity (i.e. have non-defined or open maturity) are excluded; therefore, a bank must not make assumptions as to when the maturity of such loans would occur. This treatment also applies to loans that can be contractually terminated within 30 days, as any inflows

exceeding those according the regular amortisation schedule would be “contingent” (in terms of a possible cancellation of the loan) in nature<sup>2115</sup>.

- 16.7.12 All payments (including interest payments and instalments) from retail and small business customers that are fully performing and contractually due within a 30-day horizon may result in inflows. However, banks must assume to continue to extend loans to retail and small business customers, at a rate of 50% of contractual inflows. This results in an inflow of 50% of the contractual amount<sup>2116</sup>.
- 16.7.13 All payments (including interest payments and instalments) from wholesale customers that are fully performing and contractually due within the 30-day horizon may also result in inflows. Banks must assume to continue to extend loans to wholesale clients, at a rate of 0% of inflows for financial institutions and central banks, and 50% for all others, including non-financial corporates, sovereigns, multilateral development banks, and PSEs.
- 16.7.14 This results in an inflow percentage of:
- (a) 100% for financial institution and central bank counterparties; and
  - (b) 50% for non-financial wholesale counterparties<sup>2117</sup>.
- 16.7.15 Inflows from securities maturing within 30 days not included in the stock of HQLA are treated as being in the same category as inflows from financial institutions (i.e. a 100% inflow). Banks may also recognise in this category inflows from the release of balances held in segregated accounts in accordance with regulatory requirements for the protection of customer trading assets, provided that these segregated balances are maintained in HQLA. This inflow must be calculated in line with the treatment of other related outflows and inflows covered in this framework<sup>2118</sup>.
- 16.7.16 Deposits held at other financial institutions for operational purposes, such as for clearing, custody, and cash management purposes, are assumed to stay at those institutions - i.e. they receive a 0% inflow rate. The same methodology for operational deposit outflows also applies to determine if deposits held at another financial institution are operational deposits and receive a 0% inflow<sup>2119</sup>.

#### *Other cash inflows*

- 16.7.17 The sum of all net derivative cash inflows receive a 100% inflow factor. The amounts of derivatives cash inflows and outflows is calculated in accordance with the methodology described above i.e. the cheapest to deliver method<sup>2120</sup>.
- 16.7.18 Where derivatives are collateralised by HQLA, cash inflows are calculated net of any corresponding cash or contractual collateral outflows that would result, all other things being equal, from contractual obligations for cash or collateral to be posted by the bank, given these contractual obligations would reduce the stock of HQLA<sup>2121</sup>.

*National discretion*

16.7.19 Other contractual cash inflows may be included at national discretion. Inflow percentages may be determined as appropriate for each type of inflow by supervisors in each jurisdiction. Cash inflows related to non-financial revenues are not taken into account in the calculation of the net cash outflows for the purposes of this standard<sup>2122</sup>.

**16.8 Transitional Provision**

16.8.1 The LCR came into force in 2019. However, individual countries receiving financial support for macroeconomic and structural reforms purposes may choose a different implementation schedule for their national banking systems, consistent with the design of their broader restructuring programme<sup>2123</sup>. This seems intended to apply to countries in 2019 still subject to either IMF, European Stability Mechanism or other restructuring programmes. The last ESM package of support for Greece expired in 2018. There are a number of current IMF programmes in place although they do not all qualify as macroeconomic and structural reform programmes, mainly in South America, parts of Africa and Asia.

**16.9 Summary**

16.9.1 The following tables summarises the application of the LCR:

<b>Stock of high quality liquid assets</b>	
<b>Level 1 assets</b>	
Coins and bank notes	100%
Qualifying marketable securities from sovereigns, central banks, public sector entities and multi-development banks	100%
Qualifying central bank reserves	100%
Domestic sovereign or central bank debt for non-0% risk-weighted sovereigns	100%
<b>Level 2 assets (40% of HQLA)</b>	
Sovereign, central bank, multilateral bank and PSE assets qualifying for a 20% risk weighting	85%
Qualifying corporate debt securities rated AA- or higher	85%
Qualifying covered bonds rated AA- or higher	85%
<b>Level 2B assets (15% of HQLA)</b>	
Qualifying residential mortgage backed assets	75%



<b>Stock of high quality liquid assets</b>	
Qualifying corporate debt rated between A+ and BBB-	50%
Qualifying common equity shares	50%
Sovereign, central bank and PSA debt securities rated BBB- or higher that do not qualify as a Level 1 or Level 2B asset	50%
<b>Cash outflows</b>	
<b>Retail deposits</b>	
Stable deposits (deposit insurance scheme meets additional criteria)	3%
Stable deposits	5%
Less stable deposits	10%
Term deposits with a greater maturity than 30 days	0%
<b>Unsecured wholesale funding</b>	
Demand deposits and term deposits less than 30 days provided by small business customers	
Stable deposits	5%
Less Stable deposits	10%
Operational deposits generated by clearing, custody and cash management services	
Ordinary deposits	25%
Part covered by deposit insurance	5%
Co-operative banks in an institutional network (qualifying deposits with the central institution)	25%
Non-financial corporates, sovereigns, central banks, multilateral development bank and PSEs	
Ordinary deposits	40%
If the entire amount is fully covered by the deposit insurance scheme	20%
Other legal entity customers	100%
<b>Secured funding</b>	
Secured funding with a central bank counterparty or backed by Level 1 assets with any counterparty	0%

<b>Secured funding</b>	
Secured funding transactions backed by Level 2A assets with any counterparty	15%
Secured funding transactions backed by non-Level 1 or Level 2A assets with domestic sovereigns, multilateral development banks, or domestic PSEs as counterparty	25%
Secured funding backed by RMBS eligible as Level 2B assets with any counterparty	25%
Secured funding backed by other Level 2B assets with any counterparty	50%
All other secured funding transactions	100%

<b>Additional requirements</b>	
Liquidity needs (e.g. collateral calls) related to financing transactions, derivatives and other contracts	3 notch downgrade
Market valuation changes on derivative transactions (largest absolute net 30 day collateral flows realised in the preceding 24 months)	Look-back approach
Valuation changes on non-Level 1 posted collateral securing derivatives	20%
Excess collateral held by a bank relative to derivative transactions that could be contractually called at any time by a counterparty	100%
Liquidity needs related to collateral contractually due from the bank on derivative transactions	100%
Increased liquidity needs related to derivative transactions that allow collateral substitution to non-HQLA assets	100%
Asset-backed commercial paper (ABCP), structured investment vehicles (SIVs), conduits, special purpose entities, etc.: <ul style="list-style-type: none"> <li>Liabilities from maturing ACCP, SIVs, SPEs, etc.</li> </ul>	100%

<b>Additional requirements</b>	
(applied to maturing amounts and returnable assets)	
<ul style="list-style-type: none"> <li>Asset-backed securities (including covered bonds) applied to maturing amounts</li> </ul>	
Currently undrawn committed credit and liquidity facilities provided to	
Retail and small business clients	5%
Non-financial corporates, sovereigns, central banks, multilateral banks and PSEs	10% for credit 30% for liquidity
Banks subject to prudential supervision	40%
Other financial institutions (including securities firms and insurance companies)	40% for credit 100% for liquidity
Other legal entity customers (credit or liquidity facilities)	100%
Other contingent funding liabilities (such as guarantees, letters of credit, revocable credit and liquidity facilities)	National discretion
Trade finance	0-5%
Customer short positions covered by other customer collateral	50%
Any additional contractual outflows	100%
Net derivative cash outflows	100%
Any other contractual outflows	100%

<b>Cash inflows</b>	
Level 1 assets	0%
Level 2A assets	15%
Level 2B assets: eligible RMBS	25%
Level 2B assets: other	50%
Margin lending backed by all other collateral	50%
All other assets	100%
Credit or liquidity facilities provided to the bank	0%
Operational deposits held at other financial institutions (including deposits at the centralised institution of a network of co-operative banks)	0%

<b>Cash inflows</b>	
Amounts to be received from retail counterparties	100%
Amounts to be received from non-financial wholesale counterparties from transactions other than those listed in the above inflow categories	50%
Amounts to be received from financial institutions and central banks from transactions other than those listed in the above inflow categories	100%
Net derivative cash inflows	100%
Other contractual cash inflows	National discretion

## 17. NET STABLE FUNDING RATIO

### 17.1 Introduction

17.1.1 The net stable funding ratio (NSFR) is the second liquidity metric adopted by the Basel Committee. Unlike the LCR discussed in the previous chapter, the purpose of the NSFR is to ensure that longer term liabilities are backed by sufficient longer term assets. It therefore seeks to build resilience over a longer term horizon, namely one year. It should be noted that many of the concepts and definitions used by the NSFR are derived from the LCR. It is therefore necessary to understand those definitions and concepts in order to understand the NSFR, even if the metric is different and serves a different purpose. Readers of this chapter should therefore refer to the previous chapter to understand how the NSFR works and the relevant definitions.

17.1.2 According to the Basel Committee:

“The net stable funding ratio (NSFR) requires banks to maintain a stable funding profile in relation to the composition of their assets and off-balance sheet activities. A sustainable funding structure is intended to reduce the likelihood that disruptions to a bank’s regular sources of funding will erode its liquidity position in a way that would increase the risk of its failure and potentially lead to broader systemic stress. The NSFR limits overreliance on short-term wholesale funding, encourages better assessment of funding risk across all on- and off-balance sheet items, and promotes funding stability”<sup>2124</sup>.

17.1.3 The NSFR is defined as “the amount of available stable funding relative to the amount of required stable funding. This ratio should be equal to at least 100% on an ongoing basis. Available stable funding is defined as the portion of capital and liabilities expected to be reliable over the one-year time horizon considered by the NSFR. The amount of stable funding required (‘required stable funding’) of an institution is a function of the liquidity characteristics and residual maturities of the various assets held by that institution as well as those of its off-balance sheet exposures”<sup>2125</sup>.

17.1.4 This is expressed in the following way<sup>2126</sup>:

$$\frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} \geq 100\%$$

17.1.5 The NSFR must be reported to supervisors at least quarterly<sup>2127</sup>.

#### Definitions

17.1.6 Unless otherwise stated, the definitions used by the NSFR definitions are the same as in LCR. National supervisors who implement a more stringent definition in their domestic LCR rules than those specified by the Basel Committee have a discretion whether or not to apply this stricter definition for the purposes of the NSFR requirements<sup>2128</sup>. Certain aspects of the NSFR are also subject to national discretion, in which case each supervisor can

decide in its rules how to implement the requirements based on circumstances applicable in that jurisdiction<sup>2129</sup>.

### *Scope of application*

- 17.1.7 The scope of application of the LCR is the same as other aspects of the Basel III framework. This means that the NSFR applies to all internationally active banks on a consolidated basis, but may also be used for other banks, and on any subset of entities of internationally active banks in a group as well to ensure greater consistency and a level playing field between domestic and cross-border banks<sup>2130</sup>. Banks are required to actively monitor and control liquidity risk exposures and funding needs at the level of individual legal entities, foreign branches and subsidiaries, and the group as a whole<sup>2131</sup>.
- 17.1.8 National supervisors may exempt derivative transactions with central banks arising from the latter's short-term monetary policy and liquidity operations, and to offset unrealised capital gains and losses related to these derivative transactions from available stable funding<sup>2132</sup>.

## **17.2 Basic Principles**

- 17.2.1 This section sets out the underlying principles of the NSFR which is based on the two concepts of available stable funding (ASF) and required stable funding (RSF). The Basel Committee states that these are calibrated to reflect the presumed degree of the stability of liabilities and the liquidity of assets to reflect the presumed degree of stability of liabilities and liquidity of assets<sup>2133</sup>. As with the LCR no account is taken of banks' experience of actual liquidity inflows and outflows.
- 17.2.2 The calibration is based on two principles:
- (a) funding tenor: the NSFR is calibrated so longer-term liabilities are assumed to be more stable than short-term liabilities; and
  - (b) funding type and counterparty: the NSFR is calibrated on the assumption that short-term deposits provided by retail customers, and funding provided by small business customers, are more stable than wholesale funding of the same duration<sup>2134</sup>.
- 17.2.3 The NSFR is based on the following criteria (which may not always coincide, necessitating trade-offs):
- (a) resilient credit creation: the NSFR requires stable funding for some proportion of lending to the real economy in order to ensure the continuity of this type of lending;
  - (b) bank behaviour: the NSFR assumes that banks may seek to roll over a significant proportion of maturing loans to preserve existing customer relationships even if under no obligation to do so;
  - (c) asset maturity: the NSFR assumes that some short-dated assets (maturing in less than one year) require a smaller proportion of stable funding

because banks would be able to allow some proportion of those assets to mature instead of rolling them over; and

- (d) asset quality and liquidity value: the NSFR assumes that unencumbered, high-quality assets that can be securitised or traded, and thus can be easily used as collateral to secure additional funding, or be sold in the market, do not need to be entirely financed with stable funding<sup>2135</sup>.

### 17.3 Definition of Available Stable Funding (ASF)

- 17.3.1 The amount of ASF is calculated by first assigning the carrying value (which we assume is derived from the relevant accounting treatment) of an institution's capital and liabilities to one of five categories (see below). The amount assigned to each category is then multiplied by an ASF factor, and the total ASF is the sum of these amounts. The "carrying value" is the amount of a liability or equity instrument before the application of any adjustments<sup>2136</sup>. It is unclear if this refers to regulatory adjustments/deductions from capital or accounting adjustments or both.
- 17.3.2 In determining the maturity of an asset or a liability banks are required to assume that if the instrument contains a call option then investors will exercise that option at the earliest possible date. If a bank has access to funding that is subject to an option which is exercisable at the bank's discretion, national supervisors are required to ensure that banks take into account reputational factors that may limit the bank's practical ability not to exercise the option. Further, if it is market practice for certain liabilities to be redeemed before their final maturity date, banks and supervisors must assume that this will happen, and include these liabilities in the ASF category that reflects such market practice. Options by a bank to extend the funding maturity of its obligations (such as soft-bullet structures) should generally be assumed not to be exercised if there may be reputational risks to the bank<sup>2137</sup>.
- 17.3.3 For long-dated liabilities, only the portion of cash flows falling at or beyond the six-month and one-year time horizons can be treated as having an effective residual maturity of six months or more and one year or more, respectively<sup>2138</sup>.

#### *Derivatives*

- 17.3.4 Derivative liabilities are calculated based on the replacement cost for derivative contracts (obtained by marking to market) where the contract has a positive value. If an eligible bilateral netting contract is in place, the replacement cost for the set of derivative exposures covered by the contract is the net replacement cost<sup>2139</sup>. Collateral posted in the form of variation margin in connection with derivative contracts, regardless of the asset type, is then deducted from the negative replacement cost amount<sup>2140</sup>. In other words: NSFR derivative liabilities = (derivative liabilities) - (total collateral posted as variation margin on derivative liabilities)<sup>2141</sup>.
- 17.3.5 If the bank's accounting framework reflects on its balance sheet, in connection with a derivative contract, collateral posted as variation margin that is deducted from the replacement cost amount for purposes of the NSFR,

that asset cannot be included in the calculation of a bank's RSF to avoid any double-counting<sup>2142</sup>.

*Available stable funding: the buckets*

- 17.3.6 The following liabilities and capital instruments have a 100% ASF factor (i.e. 100% constitutes ASF):
- (a) the total amount of regulatory capital, before the application of capital deductions, excluding any proportion of Tier 2 instruments with a residual maturity of less than one year;
  - (b) the total amount of any capital instrument not included in the previous bullet that has an effective residual maturity of one year or more, but excluding any instruments with explicit or embedded options that, if exercised, would reduce the expected maturity to less than one year;
  - (c) the total amount of secured and unsecured borrowings and liabilities (including term deposits) with effective residual maturities of one year or more. Cash flows falling below the one-year horizon but arising from liabilities with a final maturity greater than one year do not qualify for the 100% ASF factor; and
  - (d) retail term deposits maturing over one year that cannot be withdrawn early without a significant penalty<sup>2143</sup>.
- 17.3.7 The Basel III text adds that on-balance sheet precious metals liabilities should receive the same ASF factors as other on-balance sheet (cash) funding. There is no difference between cash settlement and physical delivery in terms of the ASF factors<sup>2144</sup>.
- 17.3.8 There is an ambiguity in the meaning of the reference to "capital instruments" in the second bullet point above. Clearly it does not mean regulatory capital as defined in Basel III. However, it is unclear whether it means capital instruments that were eligible under Basel II but not under Basel III (e.g. any remaining innovative Tier 1 instruments), or instruments that have similarities to capital instruments but were never expressly recognised by the Basel framework (e.g. any remaining perpetual must pay preference shares). This question probably does not matter as whichever the interpretation, such instruments should qualify under the third bullet point as liabilities provided the residual maturity is one year or more.
- 17.3.9 The following attract a 95% ASF factor (i.e. 95% of such deposits are treated as ASF):
- (a) stable retail deposits; and
  - (b) stable deposits provided by small business customers.
- 17.3.10 In both cases the definitions in the LCR apply<sup>2145</sup>. Please refer to the preceding chapter.
- 17.3.11 The following attract a 90% ASF factor:



- (a) less stable retail deposits; and
  - (b) most probably, less stable deposits provided by small business customers<sup>2146</sup>.
- 17.3.12 The Basel III text only references less stable *retail* deposits, but a note to the text refers also to less stable small business deposits. It would be illogical if they were not included<sup>2147</sup>. Under the LCR both are treated identically. Further, the summary published by the Basel Committee of the NSFR refers to both less stable retail and small business deposits as attracting a 95% ASF factor<sup>2148</sup>. We therefore conclude the same treatment should apply.
- 17.3.13 The 90% ASF factor applies regardless of whether under the LCR national supervisors apply an out-flow above 10%, unless a given jurisdiction chooses to apply a more conservative treatment by lowering the ASF factor under the NSFR<sup>2149</sup>.
- 17.3.14 A 50% ASF factor applies to the following:
- (a) funding (secured and unsecured) with a residual maturity of less than one year provided by non-financial corporate customers;
  - (b) operational deposits (as defined under the LCR);
  - (c) funding with residual maturity of less than one year from sovereigns, public sector entities (PSEs), and multilateral and national development banks; and
  - (d) other funding (secured and unsecured) not included in the categories above with a residual maturity of between six months and less than one year, including funding from central banks and financial institutions<sup>2150</sup>.
- 17.3.15 The eligibility of funding from national development banks in any given jurisdiction is subject to supervisory guidance, although the Basel Committee suggests that national development banks that provide financing for development projects are likely to be eligible<sup>2151</sup>.
- 17.3.16 The following receive a 0% ASF factor (i.e. are not eligible at all as ASF):
- (a) all other liabilities and equity categories not included in the above categories, including other funding with a residual maturity of less than six months from central banks and financial institutions. National supervisors may exclude from the 0% ASF factor certain deposits between banks that are part of the same co-operative network. No ASF factor is prescribed in this case, so the ASF factor will depend on national discretion<sup>2152</sup>;
  - (b) other liabilities without a stated maturity. This category includes short positions and open maturity positions that are not otherwise captured in any of the above categories. Two exceptions may be recognised for liabilities without a stated maturity, which are then assigned either a 100% ASF factor if the effective maturity is one year or greater, or 50%, if the effective maturity is between six months and less than one year:

- (i) firstly, deferred tax liabilities, which should be treated according to the nearest possible date on which such liabilities could be realised; and
  - (ii) secondly, minority interests, which should be treated according to the terms of the instrument, usually in perpetuity;
- (c) NSFR derivative liabilities net of NSFR derivative assets, if NSFR derivative liabilities are greater than NSFR derivative assets; and
- (d) “trade date” payables arising from purchases of financial instruments, foreign currencies and commodities that: (a) are expected to settle within the standard settlement cycle or period that is customary for the relevant exchange or type of transaction; or (b) have failed to, but are still expected to, settle<sup>2153</sup>.

## 17.4 Required Stable Funding

17.4.1 The second part of the NSFR is required stable funding (RSF).

### *Basic principles*

- 17.4.2 The amount of RSF is measured based on the broad characteristics of the liquidity risk profile of a bank’s assets and off-balance-sheet exposures. The amount of RSF is calculated by first assigning the carrying value of an institution’s assets to the categories listed below. The carrying value of an asset item should generally be recorded by following its accounting value, i.e. net of specific provisions, and the requirements for on-balance sheet, non-derivative assets under the leverage ratio framework. The amount assigned to each category is then multiplied by its associated RSF factor, and the total RSF is the sum of the weighted amounts added to the amount of off-balance-sheet activity (or potential liquidity exposure) multiplied by its associated RSF factor<sup>2154</sup>.
- 17.4.3 All HQLA (as defined in the LCR framework) are treated as eligible HQLA under the NSFR regardless of caps on Level 2A and Level 2B assets under the LCR, or the operational requirements under the LCR<sup>2155</sup>.
- 17.4.4 Unless explicitly stated otherwise, in the NSFR assets are allocated to maturity buckets according to their contractual residual maturity. However, this should take into account embedded optionality, such as put or call options, which may affect the actual maturity date. The RSF factors assigned to various types of assets are intended to approximate the amount of a particular asset that would have to be funded, either because it would be rolled over, or because it could not be monetised through sale, or used as collateral, in a secured borrowing transaction over the course of one year without significant expense. Under the standard, such amounts must be supported by available stable funding<sup>2156</sup>.
- 17.4.5 Assets have to be allocated to the appropriate RSF factor based on their residual maturity or liquidity value. When determining maturity, banks must assume that investors will exercise any option to extend the asset’s maturity. For assets with options to extend exercisable at the bank’s discretion,

supervisors should take into account reputational factors that may limit a bank's ability not to exercise the option. In particular, where the market expects certain assets to be extended in their maturity, banks and supervisors should assume such behaviour for the purpose of the NSFR and include these assets in the corresponding RSF category. For amortising loans (or other principal repayment claims), the portion that comes due within the one-year horizon may be treated in the less-than-one-year residual maturity category<sup>2157</sup>.

- 17.4.6 Unencumbered loans (see below for the meaning of encumbrance) without a stated final maturity, even where the borrower may repay the loan in full and without penalty charges at the next rate reset date, are deemed to have an effective residual maturity period of more than one year and are allocated either a 65% or 85% RSF factor depending on their risk weights under the standardised approach for credit risk<sup>2158</sup>. Please see below for the relevant RSF factors.
- 17.4.7 If there is a contractual provision with a review date at which the bank may determine whether a given facility or loan will be renewed or not, supervisors may authorise, on a case by case basis, banks to use the next review date as the maturity date. In doing so, supervisors must consider the incentives created, and the actual likelihood, that such facilities/loans will not in fact be renewed. In particular, options by a bank not to renew a given facility should generally be assumed not to be exercised when there may be reputational concerns<sup>2159</sup>.
- 17.4.8 In the case of exceptional central bank liquidity absorbing operations, claims on central banks may receive a reduced RSF factor. For those operations with a residual maturity equal to or greater than six months, the RSF factor is not lower than 5%. When applying a reduced RSF factor, supervisors need to closely monitor the ongoing impact on banks' stable funding positions arising from the reduced requirement and take appropriate measures as needed. Also, assets that are provided as collateral for exceptional central bank liquidity providing operations may receive a reduced RSF factor. In both cases, national supervisors should agree on the appropriate RSF factor with the central bank<sup>2160</sup>.
- 17.4.9 When determining its required stable funding, a bank must include financial instruments, foreign currencies and commodities for which a purchase order has been executed, and exclude financial instruments, foreign currencies and commodities for which a sale order has been executed, even if such transactions have not been reflected on the balance sheet under a settlement-date accounting model, provided that: (1) such transactions are not reflected as derivatives or secured financing transactions in the bank's balance sheet; and (2) the effects of such transactions will be reflected in the bank's balance sheet when settled<sup>2161</sup>.

#### *Encumbered assets*

- 17.4.10 A very important concept in determining the NSFR is whether an asset is "encumbered" as this automatically attracts a 100% RSF i.e. the bank must hold available stable funding equal to 100% of all assets that are regarded under the NSFR framework as encumbered for one year or more. Assets that

are encumbered for a period of between six months and less than one year that would, if unencumbered, receive an RSF factor lower than or equal to 50% receive a 50% RSF factor. Assets encumbered for between six months and less than one year that would, if unencumbered, receive an RSF factor higher than 50% do, however, retain that higher RSF factor. This is explained below in the list of RSF factors<sup>2162</sup>.

17.4.11 Where assets are encumbered for less than six months, the assets are treated as unencumbered. Further, assets that are encumbered for exceptional central bank liquidity operations can receive a reduced RSF factor<sup>2163</sup>.

17.4.12 An asset is “encumbered” if it is not “unencumbered”. This definition is taken from the LCR framework<sup>2164</sup>, but will be repeated here for ease of understanding:

“‘Unencumbered’ means free of legal, regulatory, contractual or other restrictions on the ability of the bank to liquidate, sell, transfer or assign the asset. An asset in the stock must not be pledged (either explicitly or implicitly) to secure, collateralise or credit-enhance any transaction, nor be designated to cover operational costs (such as rents and salaries). Assets received in reverse repo and securities financing transactions that are held at the bank, have not been rehypothecated, and are legally and contractually available for the bank's use, can be considered as part of the stock of HQLA. In addition, assets which qualify for the stock of HQLA that have been pre-positioned or deposited with, or pledged to, the central bank or a public sector entity (PSE) but have not been used to generate liquidity may be included in the stock”<sup>2165</sup>.

17.4.13 Encumbered assets include, but are not limited to, assets backing securities or covered bonds and assets pledged in securities financing transactions or collateral swaps<sup>2166</sup>.

#### *Secured lending*

17.4.14 Secured lending transactions (such as reverse repos) where the collateral is not reflected on the bank's balance sheet and has either been sold or re-hypothecated receive the following treatment. As the liquidation of the cash receivable is contingent on the return of collateral that is no longer held by the bank, the receivable is considered as encumbered. If the collateral received from a secured funding transaction has been re-hypothecated, the receivable is considered encumbered for the term of the re-hypothecation of the collateral. If the collateral received from a secured funding transaction has been sold, thereby creating a short position, the receivable related to the original secured funding transaction is likewise considered encumbered for the term of the residual maturity of this receivable<sup>2167</sup>.

17.4.15 The treatment under the NSFR depends on the term of the encumbrance. There are three possibilities:

(a) if the remaining period of encumbrance is less than six months it is considered as being unencumbered under the NSFR;

- (b) if the remaining period of encumbrance is between six months and less than one year it is assigned a 50% or higher RSF factor; and
- (c) if the remaining period of encumbrance is greater than one year it is assigned a 100% RSF factor<sup>2168</sup>.

17.4.16 If the collateral appears on the bank's balance sheet and has either been re-hypothecated or sold, then the position is the same as that set out above where the collateral is re-hypothecated. If it has been sold, creating a short position, the on-balance sheet receivable attracts an RSF factor for being encumbered for the term of the residual maturity of the receivable in accordance with the above set of rules<sup>2169</sup>.

#### *Over-collateralisation of covered bonds*

17.4.17 The following treatment applies to over-collateralisation of covered bonds. The approach depends on whether the bank is able to issue additional covered bonds against the collateral, or pool of collateral, which depends on the specific characteristics of the covered bond programme. If the collateral is provided for a specific issuance of covered bonds, then any excess collateral committed for the issuance which cannot be used to raise additional funding or be taken out of the collateral pool without affecting the characteristics of the issuance, it is considered to be encumbered for as long as it remains in the pool<sup>2170</sup>.

17.4.18 If, however, the covered bonds are issued against a collateral pool that allows for multiple issuance, subject to supervisory discretion, the excess collateral (which would actually represent excess issuance capacity) may be treated as unencumbered, provided it can be withdrawn at the issuer's discretion without any contractual, regulatory, reputational or operational impediment (such as a negative impact on the bank's targeted rating) and if it can be used to issue more covered bonds or use such collateral in any other way (e.g. by selling outright or securitising it)<sup>2171</sup>.

17.4.19 A specific impediment that must be taken into account is the case where rating agencies set a threshold for over-collateralisation where not meeting this requirement could impair the future ability of a bank to issue new covered bonds<sup>2172</sup>.

#### *Secured funding*

17.4.20 In respect of secured funding arrangements, the use of balance sheet and accounting treatments should generally result in banks excluding, from their assets, securities which they have borrowed in securities financing transactions (such as reverse repos and collateral swaps) where they do not have beneficial ownership. In contrast, banks must include securities they have lent in securities financing transactions where they retain beneficial ownership. (As a matter of English law this is impossible so this requirement should be understood in an economic sense). Banks should also not include any securities they have received through collateral swaps if those securities do not appear on their balance sheets. Where banks have encumbered securities in repos or other securities financing transactions, but have retained beneficial ownership<sup>2173</sup>, and those assets remain on the bank's

balance sheet, the bank must allocate such securities to the appropriate RSF category<sup>2174</sup>.

- 17.4.21 If collateral is pledged for a period of less than one year, but a repo has a maturity of one year or greater, then the collateral is considered encumbered for the term of the repo, and attracts an RSF factor of 100% as the collateral will need to be replaced by other collateral<sup>2175</sup>. For reverse repos with non-financial institutions where the residual maturity is less than six months and the collateral is not secured by assets that qualify for a 10% or 15% RSF, the treatment for the amount receivable is the same as for any other loan, which depends on the counterparty and the term of the transaction<sup>2176</sup>. The treatment of collateral received under a reverse repo is determined by the collateral's balance sheet and accounting treatment, which should generally result in securities borrowed being excluded from their assets. In this case there is no RSF. If, however, under applicable accounting standards the asset is held on the balance sheet, it receives an RSF depending on its characteristics<sup>2177</sup>.
- 17.4.22 Amounts receivable and payable under securities financing transactions should generally be reported on a gross basis, meaning that the gross amount of such receivables and payables should be reported on both the RSF side and ASF sides. The only exception is that securities financing transactions with a single counterparty can be netted provided that the conditions for recognition of netting agreements for securities financing transactions under the leverage ratio are met<sup>2178</sup>. This is discussed in the chapter on leverage ratio.

#### *Derivatives*

- 17.4.23 Derivative assets are calculated based on the replacement cost for all derivative contracts (obtained by marking to market) if the contract has a positive value. Where a bilateral netting contract is in place with a single counterparty that meets the conditions specified under the standardised approach to counterparty credit risk, the replacement cost for the set of derivative exposures is the net replacement cost<sup>2179</sup>.
- 17.4.24 When calculating NSFR derivative assets, collateral received in connection with derivative contracts may not offset the positive replacement cost amount, regardless of whether or not netting is permitted under the bank's accounting or risk-based capital framework, unless it takes the form of cash variation margin and meets the conditions specified under the leverage ratio for the cash portion of variation margin exchanged between counterparties to be viewed as a form of pre-settlement payment. Any remaining balance sheet liability associated with variation margin that does not meet these criteria cannot be netted against derivative assets and is assigned a 0% ASF factor<sup>2180</sup>. Where the definition in the leverage ratio is met, the existence of minimum thresholds for the exchange of margin does not preclude netting<sup>2181</sup>.
- 17.4.25 Where initial and variation margin are not different the following treatment applies. For OTC derivative transactions, any fixed independent amount a bank was contractually required to post at the inception of the transaction is considered to be initial margin, regardless of whether any of this margin is subsequently returned to the bank as variation margin payments. If the initial margin is formulaically defined at a portfolio level, the amount considered to

be initial margin reflects this amount under the NSFR, even if, for example, the total amount of margin physically posted to the bank's counterparty is lower because of variation margin payments received. For centrally cleared transactions, the amount of initial margin must reflect the total amount of margin posted (initial margin and variation margin) less any mark-to-market losses on the portfolio of cleared transactions<sup>2182</sup>.

- 17.4.26 To the extent that a bank's accounting framework treats as being on balance sheet an asset associated with collateral posted as initial margin for purposes of the NSFR, that asset should not be counted as an encumbered asset in the calculation of a bank's RSF<sup>2183</sup>.

#### *Precious metals transactions*

- 17.4.27 On-balance sheet unsecured loans in precious metals made by a bank, or deposits of precious metals placed by a bank, that are settled by cash payments receive the same RSF factors as other (cash) deposits and loans depending on the relevant characteristics, such as counterparty type, maturity and encumbrance status. Where physical delivery is provided for, loans extended in precious metals and deposits placed in precious metals are treated like physically traded commodities and are subject to an 85% RSF factor unless the loan (or deposit) is: (i) extended to (or placed with) a financial counterparty and has a residual maturity of one year or greater; or (ii) encumbered for a period of one year or more or; (iii) non-performing. In each of these cases, a 100% RSF applies. The assumed type of settlement should be determined in accordance with the approach to determine inflows applied under the LCR<sup>2184</sup>.

#### *Partially secured loans*

- 17.4.28 Some loans are partially secured and are therefore separated into secured and unsecured portions with different risk weights under the Basel capital framework. The specific characteristics of these portions of loans must be taken into account in the calculation of the NSFR: the secured and unsecured portions of a loan should each be treated according to its characteristics and assigned the corresponding RSF factor. If it is not possible to draw a distinction between the secured and unsecured part of the loan, the higher RSF factor must be applied to the whole loan<sup>2185</sup>.

#### *Specific RSF risk factors*

- 17.4.29 The NSF framework posits the following specific RSF factors i.e. the percentage of the required stable funding needing to be covered by available stable funding. This is subject to any of the specific treatments set out above.
- 17.4.30 The following assets have a 0% RSF (i.e. do not need any available stable funding as they are considered to present no liquidity risk):
- (a) coins and banknotes immediately available to meet obligations;
  - (b) all central bank reserves (including required reserves and excess reserves);

- (c) all claims (including bills and assets created by repo transactions) with central banks that have a residual maturity of less than six months; and
- (d) “trade date” receivables arising from sales of financial instruments, foreign currencies and commodities that: (a) are expected to settle within the standard settlement cycle or period that is customary for the relevant exchange or type of transaction; or (b) have failed to, but are still expected to, settle<sup>2186</sup>.

17.4.31 The following assets attract a 5% RSF factor:

- (a) marketable securities representing claims on, or guaranteed by, sovereigns, central banks, public sector entities, the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community [Union], or multilateral development banks that are assigned a 0% risk weight under the standardised approach to credit risk; and
- (b) certain non-0% risk-weighted sovereign or central bank debt securities (excluding claims on central banks with maturities of less than six months, which receive a 0% RSF factor) specified in the LCR standard<sup>2187</sup>.

17.4.32 The list in the first bullet is narrower than the equivalent list in the LCR as it omits the European Stability Mechanism and the European Financial Stability Fund. It is unclear if this is intended.

17.4.33 There is no express reference to the relevant part of the LCR standard that in the second bullet point. However, the most natural place would appear to be LCR 30.41(4) and (5) that refer to:

- (a) sovereign or central bank debt securities issued in domestic currencies by the sovereign or central bank in the country in which the liquidity risk is being taken in the bank’s home country; and
- (b) domestic sovereign or central bank debt securities issued in foreign currencies in that specific foreign currency stemming from the bank’s operations in the jurisdiction where the bank’s liquidity risk is being taken.

17.4.34 We have deleted in the second bullet the reference in the LCR to eligibility up to the amount of the bank’s net stressed outflow as this is not relevant to the NSFR framework<sup>2188</sup>.

17.4.35 A 10% RSF factor applies to unencumbered loans to financial institutions with residual maturities of less than six months, where the loan is secured against Level 1 assets as defined in the LCR, and where the bank has the ability to freely re-hypothecate the collateral for the life of the loan<sup>2189</sup>.

17.4.36 A 15% RSF factor applies to the following assets:

- (a) unencumbered Level 2A assets, as defined in the LCR, including: (a) marketable securities representing claims on or guaranteed by sovereigns, central banks, PSEs or multilateral development banks that



are assigned a 20% risk weight under the standardised approach to credit risk; and (b) corporate debt securities (including commercial paper) and covered bonds with a credit rating equal or equivalent to at least AA-; and

- (b) all other unencumbered loans to financial institutions with residual maturities of less than six months not included within the 10% RSF category above<sup>2190</sup>.

17.4.37 A 50% RSF factor applies to the following assets:

- (a) unencumbered Level 2B assets as defined, and subject to the conditions in, the LCR, including: (a) residential mortgage-backed securities with a credit rating of at least AA; (b) corporate debt securities (including commercial paper) with a credit rating of between A+ and BBB-; and (c) exchange-traded common equity shares not issued by financial institutions or their affiliates;
- (b) any HQLA, as defined in the LCR, that are encumbered for a period of between six months and less than one year;
- (c) all loans to financial institutions and central banks with residual maturity of between six months and less than one year;
- (d) deposits held at other financial institutions for operational purposes (as defined in the LCR) that are subject to a 50% ASF factor under the NSFR (see above); and
- (e) all other non-HQLA not included in the above categories that have a residual maturity of less than one year; for example, loans to non-financial corporate clients, loans to retail customers (i.e. natural persons) and small business customers, and loans to sovereigns, national development banks and PSEs<sup>2191</sup>.

17.4.38 Sovereign and PSEs bonds rated between A+ and BBB- are also subject to an RSF of 50%. This is also the case for corporate securities that would qualify as Level 2A assets but whose price has declined more than 10% within a 30-day period, but not more than 20%<sup>2192</sup>. How this should be calculated is unclear.

17.4.39 A 65% RSF factor applies to the following assets:

- (a) unencumbered residential mortgages with a residual maturity of one year or more that would qualify for a 35% or lower risk weight under the standardised approach to credit risk; and
- (b) other unencumbered loans, including loans to sovereigns, multilateral development banks, PSEs and national development banks, not included in the above categories, excluding loans to financial institutions, with a residual maturity of one year or more that would qualify for a 35% or lower risk weight under the standardised approach to credit risk<sup>2193</sup>.

17.4.40 An 85% RSF factor applies to the following assets:

- (a) cash, securities or other assets posted as initial margin for derivative contracts and cash or other assets provided to contribute to the default fund of a central counterparty (CCP), in both cases regardless of whether recorded on or off the balance sheet. Where securities or other assets posted as initial margin for derivative contracts would otherwise receive a higher RSF factor, they retain that higher factor;
- (b) other unencumbered performing loans (i.e. not more than 90 days past due) that do not qualify for the 35% or lower risk weight under the standardised approach to credit risk and have residual maturities of one year or more, excluding loans to financial institutions;
- (c) unencumbered securities with a remaining maturity of one year or more and exchange-traded equities, that are not in default and do not qualify as HQLA according to the LCR standard; and
- (d) physical traded commodities, including gold<sup>2194</sup>.

17.4.41 A 100% RSF factor applies to the following assets (meaning 100% ASF is required against holding such assets):

- (a) all assets that are encumbered for a period of one year or more;
- (b) NSFR derivative assets net of derivative liabilities, if such assets exceed liabilities;
- (c) assets without a stated maturity (including non-maturity reverse repos unless banks can demonstrate to supervisors that the non-maturity reverse repo would effectively mature in less than one year);
- (d) all other assets not included in the above categories, including non-performing loans, loans to financial institutions with a residual maturity of one year or more, non-exchange-traded equities, fixed assets, items deducted from regulatory capital, retained interest, insurance assets, subsidiary interests and defaulted securities; and
- (e) between 5% and 20% (at national discretion) of all derivative liabilities on a gross basis (i.e. negative replacement cost amounts) as calculated before deducting variation margin posted<sup>2195</sup>.

#### *Off-balance sheet liabilities*

17.4.42 According to the Basel Committee:

“Many potential off-balance sheet liquidity exposures require little direct or immediate funding but can lead to significant liquidity drains over a longer time horizon. The NSFR assigns an RSF factor to various off-balance sheet activities in order to ensure that institutions hold stable funding for the portion of off-balance sheet exposures that may be expected to require funding within a one-year horizon”<sup>2196</sup>.

17.4.43 However, the treatment under the NSFR of such positions is basically left to national discretion, presumably because of a lack of consensus amongst

members of the Committee. Only irrevocable and conditionally revocable credit and liquidity facilities provided to any client attract a specific RSF factor, which is 5% of the currently undrawn position<sup>2197</sup>. All other contingent funding obligations receive a RSF factor specified by the relevant supervisor “based on their national circumstances”<sup>2198</sup>.

#### *Interdependent assets and liabilities*

17.4.44 According to Basel III, national supervisors “have discretion in limited circumstances to determine whether certain asset and liability items, on the basis of contractual arrangements, are interdependent such that the liability cannot fall due while the asset remains on the balance sheet, the principal payment flows from the asset cannot be used for something other than repaying the liability, and the liability cannot be used to fund other assets. For interdependent items, supervisors may adjust RSF and ASF factors so that they are both 0%”<sup>2199</sup>.

17.4.45 The following criteria apply:

- (a) the individual interdependent asset and liability items must be clearly identifiable;
- (b) the maturity and principal amount of both the liability and its interdependent asset must be the same;
- (c) the bank is acting solely as a pass-through unit to channel the funding received (the interdependent liability) into the corresponding interdependent asset; and
- (d) the counterparties for each pair of interdependent liabilities and assets are not the same<sup>2200</sup>.

17.4.46 This treatment is not intended to apply to derivative transactions<sup>2201</sup>.

## 17.5 Summary

17.5.1 We now summarise the ASF and RSF factors in the following two tables for ease of reference<sup>2202</sup>.

ASF factor	Components
100%	Total regulatory capital (excluding Tier 2 instruments with a residual maturity of less than one year) Other capital instruments and liabilities with effective residual maturity of one year or more
95%	Stable demand deposits and term deposits of less than one year provided by retail and small business customers
90%	Less stable demand and term deposits with a residual maturity of less than one year provided by retail and small business customers
50%	Funding with a residual maturity of less than one year provided by non-financial corporate customers

	<p>Operational deposits</p> <p>Funding with a residual maturity of less than one year from sovereigns, public sector entities, multilateral and national development banks.</p> <p>Other funding with a residual maturity of between six months and less than one year not included in the above categories (including funding by central banks and financial institutions)</p>
0%	<p>All other liabilities and equities not included in the above categories, including liabilities without a stated maturity (with a specific treatment for deferred tax liabilities and minority interests)</p> <p>Derivative liabilities net of assets, if liabilities are greater than assets</p> <p>Trade date payables arising from purchases of financial instruments, foreign currencies and commodities</p> <p>Liabilities with interdependent assets (at national discretion)</p>

RSF factor	Components of RSF factor
0%	<p>Coins and banknotes</p> <p>All central bank reserves</p> <p>Trade date receivables resulting from sales of financial instruments</p> <p>Assets with interdependent liabilities (at national discretion)</p>
5%	Unencumbered Level 1 assets
10%	Unencumbered loans to financial institutions with a residual maturity of less than six months, where the loan is secured against Level 1 assets, and where the bank has the ability to freely re-hypothecate the collateral for the life of the loan
15%	<p>All other unencumbered loans to financial institutions with residual maturities of less than six months</p> <p>Unencumbered Level 2A assets</p>
50%	<p>Unencumbered Level 2B assets</p> <p>HQLA encumbered for a period of between six months and less than one year</p> <p>Loans to financial institutions and central banks with residual maturities of between six months and less than one year</p> <p>Deposits held at other financial institutions for operational purposes</p> <p>All other assets with a residual maturity of less than one year, such as loans</p>

RSF factor	Components of RSF factor
65%	<p>Unencumbered residential mortgages with a residual maturity of one year or more and a risk weight of 35% or less under the standardised approach to credit risk</p> <p>Other unencumbered loans, excluding loans to financial institutions, with a residual maturity of one year or more, and with a risk weight of 35% or less under the standardised approach to credit risk</p>
85%	<p>Cash, securities and other assets posted as initial margin for derivative transactions or to the default fund of a central counterparty</p> <p>Other unencumbered performing loans with risk weights greater than 35% under the standardised approach to credit risk with residual maturities of one year or more (except loans to financial institutions)</p> <p>Unencumbered securities that are not in default and do not qualify as HQLA with a remaining maturity of one year or more</p> <p>Exchange traded equities</p> <p>Physical traded commodities, including gold</p>
100%	<p>All assets encumbered for one year or more</p> <p>Derivative assets net of liabilities if assets exceed liabilities</p> <p>Between 5% and 20% of gross derivative liabilities (at national discretion)</p> <p>Assets without a stated maturity</p> <p>All other assets not included above</p>

17.5.2 The treatment of off-balance sheet liabilities have been stated above and will not be repeated here.

## 18. MARGIN REQUIREMENTS FOR NON-CENTRALLY CLEARED DERIVATIVES

### 18.1 Introduction

18.1.1 This chapter describes the Basel III requirements for initial and variation margin for non-centrally cleared derivative contracts. The requirements came fully into force on 1 September 2022. The rules form part of the response by international standard setting bodies to the very large build-up of risk associated with derivative transactions prior to the global financial crisis. One aspect of this response is the imposition of a requirement for central clearing of standardised derivatives contracts which has been led by the Financial Stability Board. As this is not part of the Basel III framework, and has been implemented in different jurisdictions in varying ways, it will not be considered here. The other main aspect is the imposition of minimum initial and variation margin requirements on non-centrally cleared derivatives entered into by banks with financial or non-financial counterparties, which is the subject of this short chapter.

18.1.2 We would stress that the requirements described in this chapter have nothing to do with regulatory capital but instead set binding standards, subject to significant national discretion, for margin to be provided in respect of most over-the-counter (OTC) derivative contracts entered into by banks. Capital requirements for derivative transactions have been described in the chapters on counterparty credit risk and market risk. This chapter therefore only addresses the standards for the exchange of margin. Where derivatives contracts are centrally cleared then the relevant central counterparty's rules will determine the requirements for initial margin, variation margin, and contributions to the central counterparty's default fund. None of these have been prescribed by Basel III and are subject to national regulation by the relevant supervisor in the jurisdiction where the central counterparty is based and authorised (although the Financial Stability Board has undertaken work in this area). Regulation of central counterparties is outside the mandate of the Basel Committee.

### 18.2 Approaches and application

18.2.1 Basically, there are two approaches: a (preferred) models-based approach and a standardised schedule-based approach for those banks unable or unwilling to seek approval for a proprietary or third party model. It seems clear that models will be expected to be used by those internationally active banks with significant OTC derivatives business, and the calibration of the standardised approach has been set to provide such an incentive.

18.2.2 According to the Basel Committee, margin requirements serve two main benefits:

“Reduction of systemic risk: only standardised derivatives are suitable for central clearing. A substantial fraction of derivatives are not standardised

and cannot be centrally cleared. These non-centrally cleared derivatives, totalling hundreds of trillions of dollars in notional amounts, pose the same type of systemic contagion and spillover risks that materialised in the recent financial crisis. Margin requirements for non-centrally cleared derivatives would be expected to reduce contagion and spillover effects by ensuring that collateral is available to offset losses caused by the default of a derivatives counterparty. Margin requirements can also have broader macroprudential benefits, by reducing the financial system's vulnerability to potentially destabilising procyclicality and limiting the build-up of uncollateralised exposures within the financial system.

Promotion of central clearing: in many jurisdictions, central clearing will be mandatory for most standardised derivatives. But clearing imposes costs, in part because central counterparties (CCPs) require margin to be posted. Margin requirements on non-centrally cleared derivatives, by reflecting the generally higher risk associated with these derivatives, will promote central clearing<sup>2203</sup>.

- 18.2.3 The Basel Committee also considers setting margin requirements at an international level to be important to prevent regulatory arbitrage<sup>2204</sup>, through banks transferring their OTC derivatives business to jurisdictions with lower requirements.

#### *Exemptions*

- 18.2.4 The requirements apply to all OTC derivative transactions except for physically settled foreign exchange forwards and swaps. However, the Basel Committee states that it “recognise[s] that variation margining of such derivatives is a common and established practice among significant market participants. The Basel Committee ... recognise[s] that the exchange of variation margin is a prudent risk management tool that limits the build-up of systemic risk. Accordingly, the Basel Committee ... agree[s] that standards apply for variation margin to be exchanged on physically settled FX forwards and swaps in a manner consistent with the final policy framework set out in this document and that those variation margin standards are implemented either by way of supervisory guidance or national regulation<sup>2205</sup>. It follows that any margin requirements for such transactions are a matter of national supervisory decision.
- 18.2.5 In respect of cross-currency swaps, the only payments excluded from initial margin requirements are the fixed physically settled FX transactions associated with the exchange of principal (which the Committee states have the same characteristics as FX forward contracts). All other payments or cash flows that occur during the life of the swap must be subject to initial margin requirements<sup>2206</sup>. The variation margin requirements apply to all components of cross-currency swaps<sup>2207</sup>.
- 18.2.6 Also exempted from margin requirements are transactions with no counterparty risk. An example is a sold option where the premium is paid up front. As the vendor has no risk if its counterparty defaults no initial or variation margin is required to be posted. The purchaser of the option has credit risk on the default of the seller and is therefore (if a bank) required to stipulate for the provision of margin by the seller<sup>2208</sup>.

*Scope in respect of counterparties*

- 18.2.7 The requirements apply to transactions with “covered entities”. A different treatment applies to inter-group transactions (see below). Covered entities include all financial firms and systemically important non-financial firms. Central banks, sovereigns, multilateral development banks, the Bank for International Settlements, and non-systemic, non-financial firms are exempt<sup>2209</sup>. Presumably other 0% risk weighted entities under the standardised approach to credit risk should also be exempt as non-financial firms such as the IMF, the World Bank group, the European Financial Stability Fund and the European Stability Mechanism, on the basis that they are not firms but international organisations.
- 18.2.8 At national discretion, public sector entities (PSEs) may be treated as sovereigns for the purposes of determining the applicability of margin requirements. In considering whether a PSE should be treated as a sovereign, national supervisors are instructed by the Basel Committee to consider the counterparty credit risk of the individual PSE<sup>2210</sup>.
- 18.2.9 The precise definition of financial firms, non-financial firms and systemically important non-financial firms is a matter of national determination by relevant supervisors<sup>2211</sup>. It follows that the list of entities within scope of the margin requirements will vary from jurisdiction to jurisdiction.

*Banks' counterparties*

- 18.2.10 Covered entities that are not banks are not subject to banking regulation and if not financial institutions, probably only to general company law<sup>2212</sup>. However, it appears from the Basel III text that banks must require that their counterparties meet the Basel III requirements in transactions with banks<sup>2213</sup>, even if they do not in transactions with other parties, as Basel III only applies to banks (although national supervisors may apply it to other entities). This means that banks can only transact with counterparties if they agree to exchange of margin. This is apparent from the statement that “[a]ll covered entities that engage in non-centrally cleared derivatives must exchange, on a bilateral basis, the full amount of variation margin ... on a regular basis (eg daily)”<sup>2214</sup>. As such counterparties may not themselves be regulated the only way to ensure compliance is to require banks only to transact on this basis.

*The € 50 million threshold*

- 18.2.11 The standard does not apply to every single OTC derivative transaction. There is a consolidated group de minimis threshold of € 50 million<sup>2215</sup>. This applies as follows. If in a specific corporate group there are three companies A1, A2 and A3, and the initial margin requirement is €100 million for each of the firm’s netting sets with each group company, then the bank must collect at least €250 million ( $250 = 100 + 100 + 100 - 50$ ) in initial margin. However, the bank may allocate the €50 million threshold among its counterparties subject to agreement with its counterparties. The bank is, however, prohibited from applying the € 50 million threshold to each counterparty in the same group with the result that the total amount of initial margin required would be only € 150 million (i.e.  $150 = 100 - 50 + 100 - 50 + 100 - 50$ )<sup>2216</sup>.



- 18.2.12 Furthermore, the requirement to apply the threshold on a fully consolidated basis applies to both the counterparty to which the threshold is being extended and the counterparty that is extending the threshold<sup>2217</sup>. What this means in practice is that each corporate group transacting with a banking group must apply this € 50 million threshold on a group basis.
- 18.2.13 The Committee recognises that implementation of the threshold requires co-operation between the bank's consolidating supervisor and supervisors of subsidiaries in other jurisdictions. As the threshold is applied on a consolidated basis, only the supervisor of the consolidated banking group is able to assess that the group does not exceed this threshold with all of its counterparties. Supervisors of subsidiaries of a banking group are naturally not able to verify whether their local subsidiaries are compliant. The Basel Committee's solution is to require communication between the consolidating supervisor and supervisors of subsidiaries in different jurisdictions to ensure that the latter have access to how the threshold applies to any local subsidiary<sup>2218</sup>.

#### *De minimis margin transfers*

- 18.2.14 The Basel III standard also contains a de minimis threshold for the making of margin payments of € 500,000<sup>2219</sup>. It follows that margin transfers calculated under the Basel III framework that are under this amount need not give rise to any actual payment, although when the threshold is exceeded they must be made. A bank cannot disregard daily margin payments calculated on a daily (or other) basis once the threshold is exceeded

#### *Intra-group transactions*

- 18.2.15 According to the Basel Committee, transactions between a firm and its subsidiaries is subject to national treatment. Individual supervisors may adopt initial and variation margin requirements that they consider appropriate<sup>2220</sup>.

#### *Cross-border transactions*

- 18.2.16 It is "recommended" that supervisors co-operate to identify conflicts and inconsistencies between national regimes in regard to the cross-border application of margin requirements<sup>2221</sup>. The objective is that national regulatory regimes should result in sufficiently consistent and non-duplicative regulatory margin requirements for non-centrally cleared derivatives<sup>2222</sup>.
- 18.2.17 The consolidating supervisor may permit a "covered entity" to comply with the margin requirements of another jurisdiction's margin rules with respect to its derivatives activities in that jurisdiction provided that the consolidating supervisor considers the other jurisdiction's margin regime to be consistent with Basel III. A branch of a subsidiary is part of the same legal entity as the head office. According to Basel III it may be subject to either the margin requirements of the jurisdiction where the head office is established or those of the country where the branch is located<sup>2223</sup>. Logically, this must be premised on the fact that the supervisor of the bank considers the rules of national supervisors in the branch to be compatible with the Basel III standard.

### 18.3 Margin Requirements

- 18.3.1 According to the Committee, the methodologies used for calculating initial and variation margin should:
- (a) be consistent across entities and reflect the potential future exposure (initial margin) and current actual exposure (variation margin) associated with the particular portfolio of non-centrally cleared derivatives at issue; and
  - (b) ensure that all counterparty risk exposures are covered fully with a high degree of confidence<sup>2224</sup>.
- 18.3.2 The requirements differ in respect of initial margin and variation margin, and distinguish between the models-based approach and the standardised approach. As the Basel Committee considers the models-based approach to be superior, and incentivises banks to use it, we will discuss it first, followed by consideration of the standardised approach.

#### *Quantitative portfolio margin models - initial margin*

- 18.3.3 The basis of the internal models-based approach is a historical simulation at a 99% confidence level over a 10 day time horizon<sup>2225</sup>. In practice, this means that the bank's model must not result in calculations of required initial margin that are exceeded more than 1% of the time over any given 10 day period i.e. about four years assuming 250 trading days per year. The Basel III standard does not state the consequences if this simulation is not met, unlike for other parts of the Basel III framework, or if models that subsequently fail to meet the requirement should have their national approval revoked, and, if so, under which circumstances. Presumably, the answer is that model approval will, absent good reasons, be revoked.
- 18.3.4 The model must include data that incorporates a period of significant financial stress<sup>2226</sup>. The period of financial stress used for calibration must be identified and applied separately for each broad asset class set (see below). In addition, the identified period, including the period of financial stress, must cover a historical period of five years or less (which would seem to require stress periods more than five years before the calculation to be disregarded). Additionally, the data within the identified period must be equally weighted by the model<sup>2227</sup> i.e. older data have the same weight as more recent data.
- 18.3.5 All quantitative models require prior supervisory approval. They may be internally developed, sourced from counterparties or purchased from a third party vendor (although, logically, sourced models should be available only to a bank's counterparties and not to a bank dealing with an unregulated corporate). Where a model is purchased from a third party (and presumably also for models sourced from counterparties, although the Basel III text does not state this) the model must be approved for use within each jurisdiction and by each bank using the model. There is no presumption that approval by one supervisor in the case of one or more institutions will imply approval by a wider set of jurisdictions<sup>2228</sup>. Additionally, the models need an internal governance process that continuously assesses the model's risk assessments, its assessments against realised data and experience, and validates the

applicability of the model to the derivatives for which it is used. This process must take into account the complexity of derivatives<sup>2229</sup>.

- 18.3.6 Bilateral netting is recognised within asset classes (but not across them) if there is in place a legally enforceable netting agreement. Multi-lateral netting is not recognised<sup>2230</sup>. The following asset classes apply to initial margin models:
- (a) currency and interest rate derivatives (including inflation swaps);
  - (b) equity derivatives;
  - (c) credit derivatives; and
  - (d) commodity derivatives<sup>2231</sup>.
- 18.3.7 Diversification, hedging and netting are recognised within each asset class but not between them. As the Basel III text states that for “a derivatives portfolio consisting of a single credit derivative and a single commodity derivative, an initial margin calculation that uses an internal model would proceed by first calculating the initial margin requirement on the credit derivatives and then calculating the initial margin requirement on the commodity derivative. The total initial margin requirement for the portfolio would be the sum of the two individual initial margin amounts because they are in two different asset classes (commodities and credit)”<sup>2232</sup>.
- 18.3.8 The Basel Committee adds that “the amount of initial margin to be collected from one party by another will be the result of ... an approved model calculation ... The specific method and parameters that will be used by each party to calculate initial margin should be agreed and recorded at the onset of the transaction to reduce potential disputes. Moreover, parties may agree to use a single model for the purposes of such margin model calculations subject to bilateral agreement and appropriate regulatory approval. In the event that a margin dispute arises, both parties should make all necessary and appropriate efforts, including timely initiation of dispute resolution protocols, to resolve the dispute and exchange the required amount of initial margin in a timely fashion”<sup>2233</sup>.
- 18.3.9 The collateral accepted for initial margin is required to be determined by individual national supervisors (see below)<sup>2234</sup>.
- 18.3.10 The Committee adds that in respect of collateral provided as initial margin:
- “Haircut requirements should be transparent and easy to calculate, so as to facilitate payments between counterparties, avoid disputes and reduce overall operational risk. Haircut levels should be risk-based and should be calibrated appropriately to reflect the underlying risks that affect the value of eligible collateral, such as market price volatility, liquidity, credit risk and FX volatility, during both normal and stressed market conditions. Haircuts should be set conservatively to avoid procyclicality. For example, haircuts should be set at a sufficiently high level during “good times” to avoid the need for sharp and sudden increases in times of stress”<sup>2235</sup>.

- 18.3.11 This seems to presume that national regulators will determine the haircuts applied to collateral under the models-based approach without the option of such haircuts being modelled.
- 18.3.12 In terms of collateral (for both initial and variation margin) the Basel Committee states:
- “these assets should be highly liquid and should, after accounting for an appropriate haircut, be able to hold their value in a time of financial stress. The set of eligible collateral should take into account that assets which are liquid in normal market conditions may rapidly become illiquid in times of financial stress. In addition to having good liquidity, eligible collateral should not be exposed to excessive credit, market and foreign exchange (FX) risk (including through differences between the currency of the collateral asset and the currency of settlement). To the extent that the value of the collateral is exposed to these risks, appropriately risk-sensitive haircuts should be applied. More importantly, the value of the collateral should not exhibit a significant correlation with the creditworthiness of the counterparty or the value of the underlying non-centrally cleared derivatives portfolio in such a way that would undermine the effectiveness of the protection offered by the margin collected (ie the so-called ‘wrong way risk’)<sup>2236</sup>.”
- 18.3.13 The list of eligible collateral is a matter of national supervisory discretion. However “as a guide” the Basel Committee states that the following types of collateral should generally be included:
- (a) cash;
  - (b) high quality government and central bank securities;
  - (c) high quality corporate bonds;
  - (d) high quality covered bonds;
  - (e) equities included in major stock indices; and
  - (f) gold<sup>2237</sup>.
- 18.3.14 However, this list “should not be viewed as being exhaustive. Additional assets and instruments that satisfy the key principle may also serve as eligible collateral. Also, in different jurisdictions, some particular forms of collateral may be more abundant or generally available due to institutional market practices or norms. Eligible collateral can be denominated in any currency in which payment obligations under the non-centrally cleared derivatives may be made, or in highly liquid foreign currencies subject to appropriate haircuts to reflect the FX risk involved<sup>2238</sup>.”

#### *Quantitative portfolio margin models - variation margin*

- 18.3.15 Basel III allows the use of risk-sensitive quantitative variation margin models, although the text contains very little information as to the specific requirements, which will therefore be set by national regulators when implementing the standard. Basel III permits both internal and third party

models provided that they are approved by national supervisors, and seems to incorporate by reference the standards for initial margin models discussed in the preceding section (although as basing variation margin on a historical simulation as opposed to current market values would not appear to make sense, it is possible that only some of the requirements need to be adhered to)<sup>2239</sup>. As regards types of eligible collateral the standard states that “eligible collateral may vary across national jurisdictions owing to differences in the availability and liquidity of certain types of collateral. As a result, it may be difficult to establish a standardised set of haircuts that would apply to all types of collateral across all jurisdictions that are consistent with the key principle”<sup>2240</sup>.

- 18.3.16 The basic rule, in respect of the provision of collateral as variation margin, is stated to be as follows:

“For variation margin, the full amount necessary to fully collateralise the mark-to-market exposure of the non-centrally cleared derivatives must be exchanged”<sup>2241</sup>.

- 18.3.17 This seems to require variation margin to be exchanged, for example, daily, based on current market prices, which is accepted market practice<sup>2242</sup>. There is also a requirement to have rigorous and robust dispute resolution procedures in place. In the event that a margin dispute arises (as often occurred during the financial crisis), both parties are required to make necessary and appropriate efforts, including timely initiation of dispute resolution protocols, to resolve the dispute in a timely fashion<sup>2243</sup>.
- 18.3.18 The question of which collateral is eligible is up to the relevant national supervisor.

#### *Standardised initial margin*

- 18.3.19 Not all banks will wish to use a model (for example, they may have only a small exposure to derivatives, or their model may not be approved, or approval may be revoked) so there needs to be an alternative. This is the standardised schedule-based method. This is a simplified calculation based on a formula derived from the gross initial margin requirement set out in the table below adjusted by the net-to-gross ratio within a legally binding netting set, which the Committee states is “an accepted practice in the context of bank capital regulation and recognises important offsets that would not be recognised by strict application of a standardised margin schedule”<sup>2244</sup>.
- 18.3.20 The following percentages apply to the calculation of the gross initial margin exposure<sup>2245</sup>.

Asset class	Initial margin as a % of the notional exposure
Credit derivatives: 0-2 year duration	2%
Credit derivatives: 2-5 year duration	5%
Credit derivatives: over 5 years	10%
Commodity derivatives	15%

Asset class	Initial margin as a % of the notional exposure
Equity derivatives	15%
Foreign exchange derivatives	6%
Interest rate derivatives: 0-2 year duration	1%
Interest rate derivatives: 2-5 year duration	2%
Interest rate derivatives: over 5 years	4%
Other derivatives	15%

- 18.3.21 The actual calculation of the initial margin requirement is determined by taking the standardised margin rates and adjusting the gross initial margin amount by the net-to-gross ratio (NGR) applicable to all derivatives within in each bilateral netting set. The required initial margin is calculated in two steps.
- 18.3.22 Firstly, the margin rate in the schedule is multiplied by the gross notional size of the derivatives contract, for each derivatives contract in the netting set.
- 18.3.23 Secondly, the gross initial margin amount is adjusted by the ratio of the net current replacement cost to the gross current replacement cost (NGR). The NGR is itself defined as the level of the net replacement cost over the level of gross replacement cost for all transactions. The total amount of initial margin required on a portfolio is determined by applying the following formula<sup>2246</sup>:

*Net standardised initial margin = 0.4 x gross initial margin + 0.6 x NGR x gross initial margin*

- 18.3.24 According to the Basel Committee:

“Subject to approval by the relevant supervisory authority, a limited degree of netting may be performed at the level of a specific derivatives contract to compute the notional amount that is applied to the margin rate. As an example, one pay-fixed-interest-rate swap with a maturity of three years and a notional of 100 could be netted against another pay-floating-interest-rate swap with a maturity of three years and a notional of 50 to arrive at a single notional of 50 to which the appropriate margin rate would be applied. Derivatives with different fundamental characteristics such as underlying, maturity and so forth may not be netted against each other for the purpose of computing the notional amount against which the standardised margin rate is applied”<sup>2247</sup>.

- 18.3.25 Transactions with no counterparty risk are excluded<sup>2248</sup>, as elsewhere under this framework. More importantly, the Committee states that banks cannot “cherry pick” between model-based approaches and schedule-based approaches under the standardised approach to generate more favourable margin requirements<sup>2249</sup>, although for legitimate purposes they can apply both the standardised and models-based approaches simultaneously. Banks need not restrict themselves to a model-based approach or to a schedule-based approach for the entirety of their derivatives positions.

- 18.3.26 Under the standardised approach initial margin must be collected at the outset of a transaction, and collected thereafter on a routine and consistent basis upon changes in measured potential future exposure, such as where trades are added to or subtracted from the portfolio<sup>2250</sup>. Further, the build-up of additional initial margin ought to be gradual so that it can be managed by parties over time. Moreover, margin levels must be sufficiently conservative, even during periods of low market volatility, to avoid pro-cyclicality<sup>2251</sup>. Implementation of this requirement is left to national supervisors.
- 18.3.27 The Basel Committee also states that “[p]arties to derivatives contracts should have rigorous and robust dispute resolution procedures in place with their counterparty before the onset of a transaction”<sup>2252</sup>.

#### *Standardised variation margin*

- 18.3.28 The rules on eligible collateral are the same as in the rest of the framework for OTC derivatives i.e. national supervisory choice.
- 18.3.29 Under the standardised approach “derivatives counterparties should ... have the option of using standardised haircuts that would provide transparency and limit procyclical effects. The Basel Committee and IOSCO have established a standardised schedule of haircuts for the list of assets appearing above. The haircut levels are derived from the standard supervisory haircuts adopted in the Basel Accord’s comprehensive approach to collateralised transactions framework”<sup>2253</sup>. The standardised haircuts are set out below<sup>2254</sup>.

Asset class	Haircut as % of market value
Cash in same currency	0%
High quality government and central bank securities with a residual maturity of less than one year	0.5%
High quality government and central bank securities with a residual maturity between one and five years	2%
High quality government and central bank securities with a residual maturity of greater than five years	4%
High quality corporate debt and covered bonds with a residual maturity of less than one year	1%
High quality corporate debt with a residual maturity between one and five years	4%
High quality corporate debt with a residual maturity of over five years	8%
Equities included in major stock indices	15%
Gold	15%
Additional and additive haircut to those set out above for derivatives obligations that differ from the collateral asset	8%

- 18.3.30 The Committee notes that “[s]chedule-based haircuts should be stringent enough to give firms an incentive to develop internal models”<sup>2255</sup>.

- 18.3.31 In the case of collateral substitution, the substituted collateral must meet all of the requirements set out above, and after application of the prescribed haircuts must be sufficient to meet the margin requirement<sup>2256</sup>.

*Re-hypothecation of margin*

- 18.3.32 In terms of initial margin the Basel Committee states:

“Because the exchange of initial margin on a net basis may be insufficient to protect two market participants with large gross derivatives exposures to each other in the case of one firm’s failure, the gross initial margin between such firms should be exchanged. Initial margin collected should be held in such a way as to ensure that:

- (a) the margin collected is immediately available to the collecting party in the event of the counterparty’s default; and
- (b) the collected margin must be subject to arrangements that protect the posting party to the extent possible under applicable law in the event that the collecting party enters bankruptcy<sup>2257</sup>.

- 18.3.33 The Committee generally prohibits re-hypothecation of initial margin<sup>2258</sup>. It should be noted that if the Basel III standard is properly interpreted as requiring legal protection from the insolvency of either the initial margin collector or the person to whom such initial margin is re-hypothecated, in the sense that in both cases the collateral provider will not suffer any loss, this is impossible under English law as re-hypothecation results in an absolute transfer of title (as with a repo), and therefore full exposure to the insolvency of the other party<sup>2259</sup>. If, on the other hand, the Basel III standard means that the transaction will be treated as required under applicable insolvency law then this requirement will be met in England.

- 18.3.34 The requirements (which, perhaps controversially) are intended to greatly limit re-hypothecation are as follows:

- (a) the customer, as part of its contractual agreement with the initial margin collector and after disclosure by the initial margin collector of its right not to permit re-hypothecation, and the risks associated with the nature of its claim to the re-hypothecated collateral in the event of the insolvency of the initial margin collector or third party, gives express consent in writing to the re-hypothecation of its collateral;
- (b) the initial margin collector is subject to regulation of liquidity risk (which will only be the case if it is a regulated institution and not a corporate);
- (c) collateral collected as initial margin from the customer is treated as a customer asset, and is segregated from the initial margin collector’s proprietary assets until re-hypothecated. Once re-hypothecated, the third party must treat the collateral as a customer asset, and must segregate it from the third party’s proprietary assets. Assets returned to the initial margin collector after re-hypothecation must also be treated as customer assets and must be segregated from the initial margin collector’s proprietary assets;



- (d) the collateral of customers that have consented to the re-hypothecation of their collateral must be segregated from that of customers that have not so consented;
- (e) where initial margin has been individually segregated, the collateral must only be re-hypothecated for the purpose of hedging the initial margin collector's derivatives position arising out of transactions with the customer in relation to which the collateral was provided;
- (f) where initial margin has been individually segregated and subsequently re-hypothecated, the initial margin collector must require the third party similarly to segregate the collateral from the assets of the third party's other customers, counterparties and its proprietary assets;
- (g) protection is given to the customer from the risk of loss of initial margin in circumstances where either the initial margin collector or the third party becomes insolvent and where both the initial margin collector and the third party become insolvent;
- (h) where the initial margin collector re-hypothecates initial margin, the agreement with the recipient of the collateral (i.e. the third party) must prohibit the third party from further re-hypothecating the collateral;
- (i) where collateral is re-hypothecated, the initial margin collector must notify the customer of that fact. Upon request by the customer and where the customer has opted for individual segregation, the initial margin collector must notify the customer of the amount of cash collateral and the value of non-cash collateral that has been re-hypothecated;
- (j) collateral must only be re-hypothecated to, and held by, an entity that is regulated in a jurisdiction that meets all of the specific conditions and in which the specific conditions can be enforced by the initial margin collector;
- (k) the customer and the third party may not be within the same group; and
- (l) the initial margin collector and the third party must keep appropriate records to show that all the above conditions have been met<sup>2260</sup>.

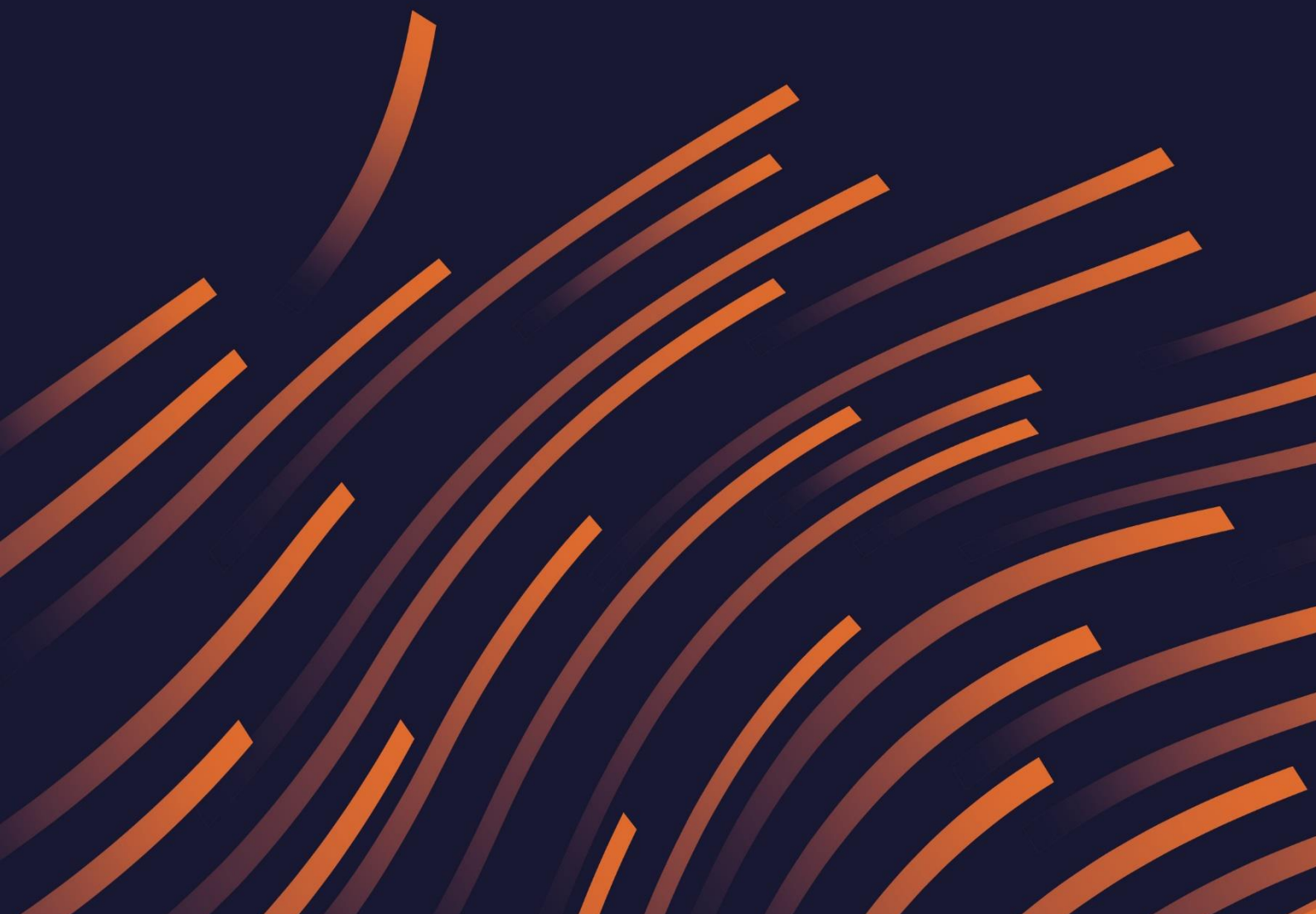
18.3.35 The level and volume of re-hypothecation must be disclosed to authorities so that they can monitor any resulting risk<sup>2261</sup>.

18.3.36 Basel III states that cash and non-cash collateral collected as variation margin may be re-hypothecated, re-pledged or re-used<sup>2262</sup>. No standards or requirements appear to apply to such re-hypothecation of variation margin. Why the Basel Committee draws a distinction between initial and variation margin is unclear.

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# Conclusion

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## Conclusion

Basel III is the product of ten years of work and is scheduled to be finally implemented fully in 2023 (a delay from 2022 as a result of the Covid 19 pandemic). The UK, along with other major jurisdictions, have announced that the actual implementation date of many Basel III requirements will be in 2025, 18 years after the onset of the global financial crisis. It may be questioned whether such a long delay in responding to the lessons of the crisis can be justified. While most of the reforms should result in better prudential outcomes, the question of whether all of the policy choices made by the Committee are right will depend on lessons of future crises. Regulation is always reactive to crises, and the creation of the Basel Committee in 1974, following the collapse of Bankhaus Herstatt, is an example of that. Like all of us, the Committee cannot predict the future.

Basel III is doubtless an improvement on Basel II and Basel I. However, its adoption piecemeal over so many years raises questions of coherence and whether the Committee has fully considered the cumulative effects of all of the changes. The most urgent changes, related to capital definition, were speedily adopted in 2010. Those on securitisation followed later, and reforms to the internal models-based approach to credit risk, market risk and operational risk have yet to be implemented. The experience of the financial crisis made reform to the standards for internal models in respect of credit and market risk inevitable. However, whether the specific new rules will make the banking system more secure can only be tested through time. In particular, the replacement of value at risk (VaR) by expected shortfall for market risk is open to numerous questions. Unlike VaR, expected shortfall is not always calculable, but being derived from VaR methodology is subject to greater data limitations. Theoretically it is a superior measure of risk. But in banking, theory is not always everything.

The restriction on the use of internal models for credit risk under the advanced IRB approach was also perhaps inevitable given the widely divergent treatment of the same asset under approved credit risk models between banks. However, the foundation IRB approach is basically unchanged. It should generate higher capital charges for those portfolios where the advanced IRB approach is no longer available. That may be a good thing in a future crisis. The inability of the Basel Committee to reach consensus on a change to the 0% risk weighting for sovereign exposures after the 1998 Russian default and the restructuring of Greek government debt during the Eurozone crisis perhaps shows the limits of international regulation based on consensus. As has been known for a long time, sovereign debt is not risk free, and the increase in sovereign indebtedness during the Covid 19 pandemic may raise questions as to the ability of some sovereigns to service their debts in a future crisis, as may the global economic effects of the 2022 war in Ukraine. Perhaps, there is no such thing as a truly safe asset.

A final concern relates to the complexity of the Basel III framework. The Committee has attempted to learn the lessons from the financial crisis, and has genuinely engaged with the regulated community, but the response has been a set of new rules that are so complicated that many readers in compliance departments, let alone senior management and the board of directors, may struggle to understand in their totality. The complex mathematics of many of the new standards may also impede the ability of management to understand and comply with their regulatory requirements. As in all areas of regulation, there needs to be a trade-off between accuracy and intelligibility if compliance is to be secured.

Further, in numerous cases the Basel Committee requires the use of simplified methodologies in calculating non-risk based capital requirements (e.g. the leverage ratio, large exposures, and liquidity). This can be justified on the basis of using more conservative metrics of risk. But it might also impose significant burdens on banks that use more advanced methods. The largest banks will doubtless prosper, but for smaller institutions there may be a significant compliance costs from Basel III, resulting in maintaining or reinforcing the existing degree of concentration in the banking sector. It is not necessary to subscribe to public choice theory in economics to see this may reduce competitiveness and growth through oligopoly profits.

Unquestionably, the analysis of risks under Basel III is far more accurate and will be a better protection against the circumstances of the 2007-2008 financial crisis than Basel II or Basel I. It is also better from a theoretical perspective as the new requirements build on the lessons of that crisis. Basel III should further insulate the banking system from future crises (and banks emerged fairly unscathed from the Covid 19 pandemic), but there is also a risk of transferring risks to other participants in the financial system that (often for good reasons) are not subject to similar requirements, such as unregulated entities or insurance companies. The shadow banking sector will therefore need consideration, as will the regulation of insurance companies and possibly hedge funds if they assume risks transferred from the banking sector. We hope that Basel III will make the world a safer place for banks, financial institutions and the global financial system.

#### *What next?*

We turn now to what the future holds for the Basel framework. The Committee has identified the ongoing digitalisation of finance as a key area of focus. Although banks' direct exposures to the crypto-asset market have been relatively limited to date, the Committee has identified no fewer than 20 potential channels for banks' direct and indirect exposures in this context, including in their capacity as lenders, issuers, providers of custody services or as market-makers<sup>2263</sup>.

Against this backdrop, the Committee is developing standards for the prudential treatment of crypto-asset exposures, to be set out in a new chapter to the Basel framework, SCO60. It set out its initial thinking in this area in 2019 with a discussion paper<sup>2264</sup> that included three high-level guiding principles that continue to remain relevant:

- **Same risk, same activity, same treatment.** This is, broadly, the notion that a crypto-asset that serves equivalent economic functions and poses the same risks as a “traditional asset” should be subject to the same capital, liquidity and other requirements as the traditional asset. The prudential treatment should, however, account for any additional risks arising from crypto-asset exposures relative to traditional assets.
- ***Simplicity.*** The design of the prudential treatment of crypto-assets should be simple and flexible, in light of banks' relatively immaterial exposures. As the market evolves, that treatment could be revisited.
- ***Minimum standards.*** Any prudential treatment of crypto-assets set by the Committee would constitute a minimum standard for internationally active banks. Jurisdictions are free to apply additional and/or more conservative measures if warranted.

The Committee published an initial consultative document in June 2021 that proposed a regulatory approach that differentiates among three broad types of crypto-asset: tokenised versions of traditional assets, regulated stablecoins and all other crypto-assets<sup>2265</sup>. It also proposed additional supervisory guidance to ensure that risks from crypto-assets not captured

under minimum (Pillar 1) requirements are assessed, managed and appropriately mitigated and consulted on new disclosure requirements related to banks' crypto-asset exposures.

In June 2022, the Committee's second consultative document on the prudential treatment of banks' crypto-asset exposures was published<sup>2266</sup>. These built on the initial proposals, with specific standards text for inclusion in the Basel Framework in the form of new chapter (SCO60: Crypto-asset Exposures). The standards will classify crypto-assets into the following broad categories:

- Group 1 crypto-assets. Those that meet in full a set of classification conditions. Group 1 crypto-assets include tokenised traditional assets (Group 1a) and regulated crypto-assets with effective stabilisation mechanisms (Group 1b), which would be subject to at least equivalent risk-based capital requirements derived from the risk weights of underlying exposures as set out in the existing Basel capital framework.
- Group 2 crypto-assets. Those that fail to meet any of the classification conditions. As a result, they pose additional and higher risks compared with Group 1 crypto-assets and consequently would be subject to a newly prescribed conservative capital treatment.

SCO60 contains additional requirements for banks' crypto-asset exposures relating to the leverage ratio, large exposures and the liquidity ratios, as well as additional guidance on Pillar 2 issues and new disclosure requirements concerning banks' crypto-asset exposures. The standards are expected to be finalised by the end of 2022.

The Committee is also pursuing a comprehensive programme to mitigate climate-related financial risks to the banking system. It is now generally accepted that climate change may result in physical and transition risks that could undermine the safety and soundness of individual banks, to say nothing of the broader financial stability implications. A recent study estimates that G20 financial institutions have nearly \$22 trillion of exposures to carbon-intensive sectors, of which on-balance sheet bank loans account for 60% of such exposures<sup>2267</sup>.

The Committee's work in this context has included publishing a set of analytical reports<sup>2268</sup> that assessed the transmission channels of climate-related financial risks to the banking system and the current state of play for measurement methodologies. These reports set out a common understanding of the climate-related financial stability risks to banks and showed how traditional risk categories used by banks - such as credit and market risk - can be used to mitigate such risks. The reports also highlighted the current gaps and methodological challenges when it comes to quantifying such risks.

The Committee is now assessing whether global measures are needed for the supervision, regulation and disclosure of banks' climate-related financial risks. It has finalised a set of 18 global principles "*to promote a principles-based approach to improving risk management and supervisory practices related to climate-related financial risks.*"<sup>2269</sup> Principles 1 through 12 provide banks with guidance on the effective management of climate-related financial risks, while principles 13 through 18 provide guidance for prudential supervisors. No prudential standards have yet been proposed.

For banks, the principles outline climate-related risk management approaches to corporate governance, strategic planning and the internal control framework. They refer to the incorporation of risks into internal capital adequacy and internal liquidity adequacy assessment processes and stress testing programmes, where appropriate. Banks are expected to assess and manage climate-related financial risks through the lens of existing categories recognised by the Basel framework, such as credit risk (including counterparty risk), market risk, liquidity risk

and operational risk. The principles also suggest that banks consider identifying and monitoring risk concentrations within and between categories of climate-related financial risks, especially concentrations by industries, sectors and geographies (“risk concentration” being defined as “any single exposure or group of similar exposures with the potential to produce losses large enough to threaten a bank’s creditworthiness or ability to maintain its core operations; or a material change in a bank’s risk profile”).

For their part, prudential supervisors are expected to ensure they have adequate expertise and resources to assess banks’ management of climate-related financial risks and should consider using supervisory climate scenario analysis and/or climate-related stress testing.

The Committee is also conducting a “gap” analysis across the Basel framework - spanning the regulatory, supervisory and disclosure pillars - to assess whether there are any aspects that require additional global measures. A number of conceptual challenges have been observed in this context, for example, addressing the risks associated with climate change requires greater reliance on future estimates and/or scenarios and there are issues associated with the time horizon over which those risks will manifest themselves. There are also challenges associated with the data and information gaps on institutions’ exposures to climate-related financial risks, though the Pillar 3 framework could help to address these.

We are witnessing policymakers, standard setters and regulators raising questions about the issues presented by climate-related financial risks, including the role of prudential regulation in tackling these risks. What will be interesting to see is how this important topic of research and analysis plays out, and we wait to see further conclusions emerge from the Committee and other bodies.

SLAUGHTER AND MAY /

# Glossary of words and expressions

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## Glossary of words and expressions

<b>ADC exposures</b>	A type of real estate exposure defined as loans to companies or SPVs financing the acquisition of land for development and construction purposes, or development and construction of any residential or commercial property.
<b>Additional Tier 1 (AT1) capital</b>	Instruments used to meet capital requirements which meet the criteria for inclusion in additional tier 1.
<b>Advanced internal ratings-based approach (A-IRB)</b>	A method of measuring a bank's credit risk by using loss given default (LGD), exposure at default (EAD), the probability of default (PD) and maturity (M) to determine the risk-weighted asset (RWA) calculated as a percentage for the total required capital.
<b>Asset-backed commercial paper (ABCP)</b>	Generally, short-term debt instruments often backed by the issuer's physical assets.
<b>Available stable funding (ASF)</b>	The portion of capital and liabilities expected to be reliable over the time span considered by the net stable funding ratio (NSFR).
<b>Backtesting</b>	In the context of market risk, commences on the date that a bank receives approval to use an internal model for one or more trading desks. The requirement is to compare the VaR measure over a one day holding period against each of (1) actual profit & loss, and (2) the hypothetical profit and loss (HPL) over the past 12 months.
<b>BA-CVA</b>	Basic approach to calculate the capital charge for credit value adjustment.
<b>The Basel Committee on Banking Supervision (Basel Committee)</b>	The committee of senior officials from central banks and banking regulators from 28 jurisdictions. The committee aims to strengthen the regulation, supervision and practices of banks worldwide with the purpose of enhancing financial stability.
<b>Bid bond</b>	A guarantee by a contractor bidding to work on a project. The contractor gives a guarantee for a specified percentage of the tender price which guarantees that the contractor will not withdraw its bid.
<b>Bridge bank</b>	An institution created by a regulator or central bank to run a failed bank until the bank is bought out or its business otherwise resolved.
<b>Business indicator (BI)</b>	A financial statement-based proxy for operational risk determined by the Basel Committee. Used under the standardised approach to operational risk.
<b>Business indicator Component (BIC)</b>	A figure determined by the Basel Committee by multiplying the business indicator (BI) of a set of regulatory coefficients. Used to calculate a bank's operational risk.



<b>Capital adequacy ratio (CAR)</b>	The ratio of a bank's available capital to its risk-weighted assets.
<b>Capital conservation buffer</b>	A layer of capital set at 2.5% of total risk-weighted assets. If the buffer is used when losses are incurred, restrictions apply to capital distributions via dividends, share buybacks and discretionary bonus payments to staff.
<b>Capital Requirements Regulation</b>	Regulation (EU) No. 575/2013 (as amended) that implements in part the Basel III capital requirements in the EU/EEA..
<b>Central counterparty</b>	Definition which applies to transactions subject to the specific mandatory treatment of CCP-cleared transactions: a clearing house that interposes itself between counterparties to contracts traded in one or more financial instruments, becoming the buyer to every seller, and the seller to every buyer, thereby ensuring the performance of open market contracts. Central counterparties are further subdivided into "qualifying" and "non-qualifying" central counterparties for capital adequacy purposes.
<b>Clean-up call</b>	An option that permits securitisation exposures to be called by the issuer - or the securitisation terminated - before all of the underlying exposures in the pool - or reference entity for a synthetic securitisation - have been discharged.
<b>Clearing member</b>	Definition which applies to transactions subject to the specific mandatory treatment of central counterparty (CCP)-cleared transactions: a member of, or a direct participant in, a clearing system operated by a CCP that is entitled to enter into transactions with the CCP.
<b>Client</b>	Definition which applies to transactions subject to the specific mandatory treatment of CCP-cleared transactions: a party to a transaction with a CCP through either a clearing member acting as a financial intermediary, or a clearing member guaranteeing the performance of the client to the CCP.
<b>Common equity tier one capital (CET1)</b>	Capital used to meet regulatory capital requirements comprising common shares, share premium on such shares, retained earnings, accumulated comprehensive income and other disclosed reserves.
<b>Collateralised debt obligation (CDO)</b>	A type of debt security backed by a pool of securitised fixed income assets, which may be loans or bonds, sold by the issuer to investors or synthetic securitisation of other securitisations.
<b>Consolidated supervision</b>	The evaluation of a bank's financial position by reference to the consolidated position of all relevant entities in the banking group.
<b>Countercyclical buffer</b>	A capital buffer designed to protect banks from risks arising from changes in the economic cycle. It is generally activated by regulators where the jurisdiction concerned experiences excessive credit growth. The buffer generally ranges from 0 to 2.5% of total risk-weighted assets, depending on the level of risk assessed by national authorities.

<b>Counterparty credit risk</b>	The risk that a counterparty to a derivative transaction could default before the final settlement of the transaction's cash flows.
<b>Covered bonds</b>	Instruments whose terms and return reference a package of loans sold by banks to financial institutions. The underlying loans remain on the books of the issuing bank, but the pool is hypothecated to cover repayments on bonds sold in the capital market reducing the risk of losses to investors.
<b>Credit conversion factor</b>	A specified percentage of an off-balance sheet exposure is used in Basel III regime to measure the probability of that off-balance sheet exposure becoming an on-balance sheet exposure before the relevant counterparty defaults.
<b>Credit default swap (CDS)</b>	An arrangement in which the seller of the CDS agrees to compensate the buyer if one or more referenced obligors defaults.
<b>Credit enhancement</b>	In securitisations, contractual arrangements under which the bank or other originator provides a specified level of protection to other parties to the transaction (usually the noteholder).
<b>Credit value adjustment</b>	A credit valuation adjustment is a change in the market value of derivative instruments to take account of credit risk. It therefore represents the discount in the market value of a derivative to take account of the possibility of the default of the counterparty.
<b>Cross-product netting</b>	Definition used by the CRR framework: the inclusion of transactions in different product categories within the same netting set.
<b>Default fund</b>	Clearing members' funded or unfunded contributions to, or underwriting of, a CCP's mutualised loss sharing arrangements.
<b>Deferred tax assets</b>	On balance sheet claims which reduces future tax liabilities.
<b>Delivery versus payment (DvP) transactions</b>	Transactions in financial instruments where both legs (i.e. delivery and payment) are required to take place at the same time.
<b>Dividend stopper</b>	Provision in the terms of a capital instrument which prevents dividends from being paid if a coupon payment under the capital instrument is deferred or cancelled.
<b>Dodd-Frank Wall Street Reform and Consumer Protection Act</b>	US legislation enacted in 2010 in response to the 2008 financial crisis. The act imposes increased regulation on banks, mortgage lenders and credit rating agencies, including by creating several new government agencies responsible for overseeing various aspects of the financial services sector.
<b>Domestic systemically important bank (D-SIB)</b>	A bank the failure of which could, in broad terms, lead to a domestic financial crisis.
<b>Early amortisation provision</b>	In the context of securitisation, a mechanism that, once triggered, accelerates the reduction of the investor's interest in the underlying exposures of a securitisation of revolving credit facilities, and allows investors to be paid out prior to the original maturity of the securities issued.

<b>European Market Infrastructure Regulation (EMIR)</b>	Regulation (EU) No. 648/2012 (as amended) addresses ( <i>inter alia</i> ) the regulation of OTC derivatives, central counterparties and trade repositories.
<b>Export credit agency (ECAs)</b>	Governmental or semi-governmental entity that offers trade finance to help domestic companies export or guarantees goods or services.
<b>Exposure at default (EAD)</b>	The loss a lender may be exposed to if a borrower defaults on a loan.
<b>External credit assessment institution (ECAI)</b>	A credit rating agency that is authorised by banking regulators to provide credit assessments used by banks to calculate regulatory capital requirement for credit exposures.
<b>External ratings-based assessment</b>	A credit rating provided by an ECA.
<b>Financial component (FC)</b>	Along with the interest, leases and dividend component (ILDC) and the services component (SC), one of the three figures used to calculate the business indicator (BI). The BI is one of the figures used to determine the capital charge for operational risk. The FC is likewise the sum of two components. The first is the absolute value of the trading book profit and loss account for the trading book. The second is the absolute value of the profit and loss account for the banking book. The two figures are added. The use of absolute values mean that the larger of the average profit or loss over three years is used as a number with a positive sign.
<b>Foundation internal ratings-based approach (F-IRB)</b>	A method of measuring a bank's credit risk whereby the bank develops its own model to estimate the probability of default. Under F-IRB banks use their own internal data on probability of default (PD). The other components - loss given default (LGD) and exposure at default (EAD) are set in accordance with supervisory parameters. Supervision may require banks to incorporate an express maturity (M) dimension.
<b>Free delivery</b>	A free delivery occurs when a bank transfers title to financial instruments without receiving payment at the same time, so there is a delay between delivery of the financial instruments and payment.
<b>Group of Central Bank Governors and Heads of Supervision (GHOS)</b>	A committee which oversees the work of the Basel Committee. It is made up of governors of central banks and heads of supervision of non-central banks from member countries of the Basel Committee.
<b>Global systemically important bank (G-SIB)</b>	A bank the failure of which might, in broad terms, lead to a financial crisis or present systemic risk to the financial global market. The list of banks is based on a methodology designed by the Basel Committee.
<b>Hedging set</b>	Definition used by the CRR framework: a set of transactions within a single netting set within which full or partial offsetting is recognised when calculating the potential future exposure add-ons under the standardised approach to counterparty credit risk.

<b>High-quality liquid asset (HQLA)</b>	An asset which can be quickly and easily converted into cash with little or no loss to its value.
<b>‘Home’ supervisor</b>	Regulator that supervises a banking group on a consolidated basis, under the Basel framework.
<b>‘Host’ supervisor</b>	Regulator that supervises a subsidiary of a banking group incorporated in a jurisdiction outside the jurisdiction of the ‘home’ supervisor (supra), under the Basel framework.
<b>Hypothetical profit and loss (HPL)</b>	The daily P&L produced by revaluing the positions held at the end of the previous trading day using the market data at the end of the current day. Commissions, fees, intraday trading and new/modified transactions, valuation adjustments for which separate regulatory capital approaches have been otherwise specified as part of the rules and valuation adjustments which are deducted from CET 1 are excluded from the HPL. Value adjustments updated daily should usually be included in the HPL.
<b>Implicit support</b>	In the context of securitisation, this arises when a bank provides support to a securitisation in excess of its predetermined contractual obligation. For example, a bank might repurchase exposures from the pool above current market value to protect investors in the securities from losses, or provide additional credit support after the inception of the securitisation. Implicit support is published under Basel III.
<b>Internal assessment approach (SEC-IAA)</b>	Internal assessment process used for calculating regulatory capital requirements. It can be used, subject to supervisory approval, for securitisation exposures to ABCP programmes (e.g. liquidity facilities and credit enhancements) provided that the bank concerned has an approved IRB model, although this need not relate to the securitised exposures.
<b>Internal capital adequacy assessment process (ICAAP)</b>	An internal assessment of a firm’s capital requirements carried out to identify appropriate risk management techniques and risks not otherwise appropriately calibrated under the Basel III Pillar 1 framework.
<b>Internal loss multiplier (ILM)</b>	A scaling factor, calculated by the Basel Committee, that is based on a bank’s average historical losses and the business indicator component (BIC). Used to help determine the standardised approach to calculating a bank’s operational risk.
<b>Internal models method (IMM-CRR)</b>	Approach to calculating the capital charge for CRR for non-centrally cleared transactions which can be used subject to prior supervisory approval.
<b>ISDA Master Agreement</b>	A standardised template for derivative transactions published by the International Swaps and Derivatives Association.
<b>Independent collateral amount (ICA)</b>	Figure used in the calculation of replacement cost for derivative and certain other transactions. The ICA represents: (i) collateral (other than variation margin) posted by a bank’s counterparty that the bank may realise upon the default of the counterparty, the amount of which does not change in response to the value of the

transactions it secures and/or (ii) the "independent amount" defined in market standard documentation.

<b>Initial margin</b>	A clearing member's or client's funded collateral posted to a central counterparty (CCP) to mitigate the potential future exposure of the CCP to the clearing member arising from possible future changes in the value of transactions.
<b>Interest, leases and dividend component (ILDC)</b>	Along with the services component (SC) and the financial component (FC), one of the three figures used to calculate the business indicator (BI). The BI is one of the figures used to determine the bank's capital charge for operational risk. The ILDC has two elements. The first depends on net interest and interest earning assets. The second refers only to dividend income. Specifically the first part of the calculation is derived by determining the lesser of (1) the absolute value of interest income less expenses (i.e. negative figures are treated as positive, so if expenses exceed income the figure for net expenses is treated as the figure with a positive sign) and (2) interest earning assets multiplied by 2.25%. The second part of the equation is simply the total dividend income of the bank. The ILDC is the sum of these two parts (using an average over three years).
<b>Internal Ratings-based (IRB) approach</b>	An approach to calculating regulatory capital by banks using their own internal model and components to generate capital charges for credit risk.
<b>IOSCO</b>	The International Organization of Securities Commissions.
<b><math>K_{IRB}</math></b>	The ratio used to calculate the IRB capital charge for an underlying pool of exposures in securitisation. $K_{IRB}$ is the ratio, expressed as a decimal of the IRB capital requirement for the underlying pool (including expected loss, and dilution risk, where applicable) had the pool not been securitised.
<b>Large exposure</b>	In Basel III, a large exposure is defined as any exposure of a bank to a counterparty or group of connected counterparties equal to or above 10% of the bank's Tier 1 capital (core Tier 1 and additional Tier 1 capital) less deductions.
<b>Level 1 assets</b>	The highest quality and most liquid high quality liquid assets (HQLAs). Level 1 assets are generally comprised of central bank reserves, coins and banknotes and marketable securities backed by sovereigns and central banks.
<b>Level 2 assets</b>	High quality liquid assets (HQLAs) that are lower quality than Level 1 assets. Level 2 assets are split into Level 2A and Level 2B assets. Level 2A assets comprise certain government securities, covered bonds and corporate debt securities. Level 2B assets include lower rated corporate bonds, residential mortgage backed securities and certain equities.
<b>Leverage ratio</b>	The leverage ratio is Tier 1 capital divided by aggregate exposures calculated generally on a gross basis. This is expressed as a percentage and the minimum leverage ratio is 3%. This is a non-

	risk based measure which exists in addition to risk-based capital requirements.
<b>Liquidity coverage ratio (LCR)</b>	A requirement to hold an adequate amount of high-quality liquid assets (HQLA) that can be converted into cash or equivalent if required to fulfil the need for liquidity during a stress scenario lasting up to 30 calendar days under the LCR metric.
<b>Loan-to-value ratio</b>	The amount of a loan taken over real property divided by the property's value.
<b>Long-settlement transactions</b>	A transaction where a party undertakes to deliver a financial instrument or cash against a counterparty's financial instrument or cash at a settlement or delivery date that is longer than the market standard for this type of transaction.
<b>Loss absorbency</b>	A bank's ability to sustain losses without falling below its regulatory capital requirement. All capital instruments are required to be capable of absorbing losses.
<b>Loss given default (LGD)</b>	The "recovery rate" on a loan if a borrower defaults.
<b>Margin agreement</b>	A contractual agreement, or part of a wider agreement, under which one party must supply margin to another party. It consists of initial margin and variation margin.
<b>Margin lending transaction</b>	A transaction in which a bank extends credit in connection with the purchase, sale, carrying or trading of securities. Margin lending expressly excludes other loans that are secured by securities collateral. Generally, in margin lending the loan is collateralised by securities with a greater value than the amount of the loan.
<b>Margin period of risk</b>	The period of time from the last exchange of collateral covering a netting set of transactions with a defaulting counterparty until further variation margin is obliged to be provided or that counterparty is closed out.
<b>Margin threshold</b>	The largest amount of margin that remains outstanding until one party has the right to call for variation margin. Normally, the trigger for a margin call will be some metric being exceeded, such as outstanding exposure value. This will be defined either in the relevant agreement with the counterparty, or by the CCP where transactions are centrally cleared.
<b>Master netting agreement</b>	An agreement under which the amount owed under several offsetting transactions can be treated as a net amount. Usually, this is documented under an ISDA master agreement or cross-product netting agreement.
<b>Mortgage service rights agreement</b>	An agreement whereby the originator of a mortgage transfers the rights to service that mortgage to a third party. Servicing a mortgage may involve collecting payments and forwarding them on to the originator or noteholders.

<b>Multi-lateral development bank</b>	International financial organisation that funds economic development in specified countries or globally, with member states providing the funding which generally operate with a mandate to achieve specified goals.
<b>Net independent collateral amount (NICA)</b>	Figure used in calculation of replacement cost. Any collateral (segregated or unsegregated) posted by the counterparty less the unsegregated collateral posted by the bank. It is relevant to derivative and certain other transactions.
<b>Net stable funding ratio</b>	This is a requirement for banks to hold enough stable funding corresponding to their long-term assets over a one-year horizon of sustained liquidity stress.
<b>Netting set</b>	A group of transactions with a single counterparty subject to a legally enforceable bilateral netting agreement for which netting is recognised for regulatory capital purposes. Each transaction that is not subject to an enforceable bilateral netting arrangement must be interpreted as its own netting set. Netting sets are relevant to many different areas of Basel III which permit bilateral netting to be recognised for capital purposes.
<b>Non-performing loans (NPLs)</b>	A loan in respect of which the borrower is in default and has failed to make the required payments for a set period of time.
<b>NPL securitisation</b>	A securitisation of non-performing loans where the ratio of non-performing loans to other loans is at least 90% at the origination cut-off date and any subsequent date at which the pool is replenished, or assets are removed from the pool.
<b>Operational risk capital requirement (ORC)</b>	The capital requirement for operational risk generated by multiplying the business indicator component (BIC) by the internal loss multiplier (ILM).
<b>Organisation for Economic Co-operation and Development (OECD)</b>	An intergovernmental organisation of developed economies that advises, as well as developing standards, on social, economic and environmental issues.
<b>Performance bonds</b>	A surety bond which guarantees completion of a project by a contractor to an acceptable standard.
<b>Potential future exposure (PFE)</b>	An add-on to the replacement cost of a derivative transaction which must be calculated under Basel III to address the risk that at the time of default the size of the exposure may have increased due to movements in the market value of the derivative instrument.
<b>Probability of default (PD)</b>	The probability that a credit exposure will default over a one year time horizon based on the bank's internal loss data and issued in all IRB models of credit risk.
<b>Profit &amp; loss attribution (PLA) test</b>	A method for assessing the robustness of banks' risk management models for calculating market risk by comparing the risk-theoretical P&L predicted by trading desk risk management models. It compares the daily risk-theoretical P&L (RTPL) with the daily hypothetical P&L (HPL).

<b>Qualifying central counterparty</b>	An entity licensed to operate as a CCP and is permitted to operate as such. The CCP must be based in and prudentially regulated in its jurisdiction in accordance with the Principles for Financial Market Infrastructures published by the Committee on Payments and Market Infrastructures and IOSCO. If, however, the CCP is established in a jurisdiction where there is no regulation of CCPs then the relevant banking supervisor can assess if the foregoing requirements are met. In addition, specified information must be provided either by the CCP or another person to enable calculation of the capital charge for exposures (see below), as well as enabling the supervisors of clearing member banks to verify this calculation. Basically, the difference between a qualifying CCP and other CCPs seems to be prudential regulation in accordance with international standards.
<b>Qualifying revolving retail exposures</b>	Revolving, unsecured loans to individuals with a maximum exposure to an individual of €100,000 which have a low loss rate relative to average loss rate and where the relevant national supervisor agrees with their categorisation as qualifying revolving retail exposures.
<b>Reciprocal cross-holdings</b>	Reciprocal investments in own funds instruments or other capital instruments by financial institutions to artificially inflate their capital position.
<b>Replacement cost (RC)</b>	The mark-to-market cost of replacing on any given day a derivative exposure with a positive market value should the counterparty default.
<b>Re-securitisation</b>	A securitisation exposure in which the risk associated with an underlying pool of exposures is tranching and at least one of the underlying exposures is itself a securitisation exposure.
<b>Residual risk add-on (RRAO)</b>	The simple sum of gross notional amounts of instruments with residual risks, multiplied by a risk weight of 1.0% for instruments with an exotic underlying (e.g. weather derivatives) or 0.1% for instruments with other residual risks (e.g. complex derivatives such as barrier options).
<b>Required stable funding (RSF)</b>	The amount of stable funding a bank is required to hold under Basel III given the liquidity characteristics of its assets and the liquidity risk arising from its off-balance sheet exposures.
<b>Risk-theoretical P&amp;L</b>	The daily trading desk P&L that is produced by the valuation of the trading desk's risk management model. The model must include all risk factors that are included in the bank's ES model, with supervisory parameters and any risk factors deemed not modellable, but disregarding risk factors not taken into account in the trading desk risk management model.
<b>Risk-weighted assets (RWA)</b>	A bank's assets weighted according to how risky they are under Basel III. The calculation of risk-weighted assets is used to determine a bank's capital requirements.
<b>Securities financing transaction</b>	A transaction where "the value of the transaction depends on market valuations and the transactions are often subject to margin agreements". The range of transactions are: repurchase agreements, reverse repurchase agreements, securities lending and



	<p>borrowing and margin lending transactions. Only repo-style transactions are intended to be caught.</p>
<b>Securitisation of revolving credit facilities</b>	<p>A securitisation in which one or more underlying exposures represents, directly or indirectly, current or future drawings on revolving credit facilities.</p>
<b>Services component</b>	<p>Along with the interest, leases and dividend component (ILDC) and the financial component (FC), one of the three figures used to calculate the business indicator (BI). The BI is one of the figures used to determine the capital charge from a bank's operational risk. The SC has two components. The first is the greater of other operating income and other operating expenses. There is no netting, and only the larger figure applies. The second is the greater of fee income and fee expenses. The SC is simply the sum of these two maxima.</p>
<b>Simple, transparent and comparable (STC) securitisations</b>	<p>A traditional securitisation meeting specified regulatory criteria where the cash flows from an underlying pool of exposures is used to service at least two different stratified risk positions or tranches reflecting different degrees of credit risk.</p>
<b>Standardised approach</b>	<p>The approach to calculating regulatory capital for credit risk generally by using ratings from external credit rating agencies where a jurisdiction (e.g. the USA) does not allow the use of external ratings or different set of standards applies. The standardised approach must be used by all banks that do not have permission to use an IRB approach.</p>
<b>Synthetic securitisation</b>	<p>A securitisation structure with at least two different stratified risk tranches that reflect different degrees of credit risk where the credit risk of an underlying pool of exposures is transferred, in whole or in part, through the use of funded credit derivatives (e.g. credit-linked notes) or unfunded credit derivatives (e.g. credit default swaps) or guarantees that hedge the credit risk on a portfolio. There is no balance sheet transfer of risk.</p>
<b>Total loss absorbing capacity (TLAC)</b>	<p>A standard, published by the Financial Stability Board (FSB), which requires global systemically important banks (G-SIBs) to maintain enough equity and bail-inable debt to ensure investors bear the bank's losses in a default and reduce the possibility of a government bail-out.</p>
<b>Tier 2 capital</b>	<p>A category of capital which may be held in addition to Tier 1 capital. Tier 2 capital includes certain hybrid capital instruments and long-term cover (five years) subordinated debt.</p>
<b>Trade exposures</b>	<p>Trade exposures include the current and potential future exposure of a clearing member or a client to a CCP arising from OTC or exchange-traded derivatives, securities financing transactions, or initial margin contributions.</p>
<b>Troubled Assets Relief Program (TARP)</b>	<p>A US government initiative to stabilise the financial sector following the 2008 financial crisis by buying toxic assets from financial institutions. It was never implemented in this form and TARP money was used to recapitalise US major financial institutions.</p>

<b>Value at risk (VaR) model</b>	A model used to calculate regulatory capital requirements by quantifying the maximum possible loss over a specific timeframe to a specified percentage.
<b>Variation margin</b>	A clearing member's or client's funded collateral posted on a specified, usually daily or intra-day basis to a CCP based on price movements in cleared transactions.
<b>The 1988 Capital Accord</b>	The minimum capital requirements for banks published by the Basel Committee in 1988.
<b>The 1996 Market Risk Amendment</b>	The requirement for banks to maintain regulatory capital for its own account in respect of market-traded financial assets held by the bank. These assets included equities, commodities and derivatives.

SLAUGHTER AND MAY /

# Endnotes

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- <sup>1</sup> Chuck Prince, the then CEO of Citigroup, notoriously said “When the music stops, in terms of liquidity, things will be complicated. But as long as the music is playing, you’ve got to get up and dance. We’re still dancing” FT July 10 2007.
- <sup>2</sup> Some exceptions exist, such as Iceland, which only rescued the domestic operations of its banks. This led to a prolonged diplomatic dispute with the UK and the Netherlands, which after failed attempts at a settlement following two negative referenda in Iceland, was referred to the EFTA court. The court ultimately decided in favour of Iceland: Case E-16/11 [2013] EFTA Ct. Rep. 4. The claim by the UK Financial Services Compensation Scheme was ultimately repaid from the assets of the defunct bank Landsbanki.
- <sup>3</sup> SRP 10.1.
- <sup>4</sup> SRP 10.3.
- <sup>5</sup> SRP 10.4.
- <sup>6</sup> SRP 10.5.
- <sup>7</sup> SRP 20.1.
- <sup>8</sup> SRP 20.2.
- <sup>9</sup> SRP 20.3.
- <sup>10</sup> SRP 20.4.
- <sup>11</sup> SRP 30.
- <sup>12</sup> SRP 31.1.
- <sup>13</sup> SRP 31.2.
- <sup>14</sup> SRP 98.
- <sup>15</sup> SRP 32.
- <sup>16</sup> SRP 33.
- <sup>17</sup> SRP 34.
- <sup>18</sup> SRP 35.
- <sup>19</sup> SRP 36.
- <sup>20</sup> SRP 50.
- <sup>21</sup> DIS 10.1.
- <sup>22</sup> DIS 10.3.
- <sup>23</sup> DIS 10.14.
- <sup>24</sup> DIS 10.15.
- <sup>25</sup> DIS 10.18.
- <sup>26</sup> DIS 10.19.
- <sup>27</sup> DIS 10.20.
- <sup>28</sup> DIS 20.
- <sup>29</sup> DIS 21.
- <sup>30</sup> DIS 25.
- <sup>31</sup> DIS 26.
- <sup>32</sup> DIS 31.
- <sup>33</sup> DIS 35.
- <sup>34</sup> DIS 40.
- <sup>35</sup> DIS 42.
- <sup>36</sup> DIS 50.
- <sup>37</sup> DIS 51.
- <sup>38</sup> DIS 60.
- <sup>39</sup> DIS 70.
- <sup>40</sup> DIS 75.
- <sup>41</sup> DIS 85.
- <sup>42</sup> SCO 10.1.
- <sup>43</sup> SCO 10.2.
- <sup>44</sup> SCO 30.1 n. 1 states that financial activities do not include insurance activities. N. 2 adds “[e]xamples of the types of activities that financial entities might be involved in include financial leasing, issuing credit cards, portfolio management, investment advisory, custodial and safekeeping services and other similar activities that are ancillary to the business of banking”. This note clarifies that “banking is seen as not confined to deposit taking and lending, but encompasses the activities of so-called universal banks on the continental European model”. The origin of this seems to be the European Commission proposal for the Second Banking Co-ordination Directive (1988) where the list of activities set out in the Annex was titled activities “integral to banking”.
- <sup>45</sup> SCO 10.3.
- <sup>46</sup> SCO 10.5.
- <sup>47</sup> SCO 10.3 n. 2.
- <sup>48</sup> SCO 10.4.
- <sup>49</sup> SCO 10.4 FAQ1.
- <sup>50</sup> SCO 30.1.
- <sup>51</sup> *Ibid* and SCO 30.1 n. 1.
- <sup>52</sup> SCO 30.2.
- <sup>53</sup> SCO 30.3.
- <sup>54</sup> SCO 30.4.
- <sup>55</sup> *Ibid*.
- <sup>56</sup> SCO 30.5.
- <sup>57</sup> *Ibid*.
- <sup>58</sup> SCO 3.5 FAQ 1.
- <sup>59</sup> SCO 30.7.

- <sup>60</sup> SCO 30.6.
- <sup>61</sup> Save for a press release on innovative Tier 1 capital which was abolished as a form of capital under Basel III.
- <sup>62</sup> CAP 10.1. Under Basel II the position was more complicated as there was a third type of Tier 1 capital (innovative Tier 1), a second type of Tier 2 capital (upper Tier 2 capital) and also Tier 3 capital. All of these have been abolished.
- <sup>63</sup> CAP 10.2.
- <sup>64</sup> CAP 10.3.
- <sup>65</sup> CAP 10.5.
- <sup>66</sup> Under Basel II it was possible to structure common equity Tier 1 capital so as to include a preferential distribution provided there was not also a preference on liquidation.
- <sup>67</sup> It was common before 2010 to issue innovative Tier 1 instruments out of a special purpose vehicle to obtain preferential tax treatment.
- <sup>68</sup> This requirement is obvious as otherwise the bank could artificially create capital by funding external issuances.
- <sup>69</sup> Under Basel II this requires payment in cash and not (unlike under the Companies Act 2006) an undertaking to pay.
- <sup>70</sup> CAP 10.8 FAQ 2.
- <sup>71</sup> CAP 10.8.
- <sup>72</sup> CAP 10.8 n. 2.
- <sup>73</sup> CAP 10.9.
- <sup>74</sup> As to which see the discussion of common equity Tier 1 capital. An undertaking to pay is insufficient.
- <sup>75</sup> Dated instruments issued with automatic roll-over features cannot be treated as perpetual. However, if the instruments mandatorily converts into common shares at a predefined date they are eligible. However, if the instrument has a call option that is simultaneous or near simultaneous to enable the bank to avoid conversion it will not be eligible as regulatory capital.
- <sup>76</sup> If the instrument is structured so that after the first (or other) call date it would be subject to a withholding tax gross-up then this requirement as being equivalent to a step-up. Other examples given by the Basel Committee include a call option with an increase in the credit spread if the call is not exercised, a call option combined with a requirement or option to convert the instruments into shares if not exercised and a call option combined with a change in the reference rate where the credit spread over the second reference rate is greater than the initial payment rate less the swap rate. Conversion from a fixed rate to a floating rate (or vice versa) is not seen as an incentive to redeem.
- <sup>77</sup> Calls exercisable after that date, such as at every interest payment date after five years, are allowed.
- <sup>78</sup> The call must relate to the issuer, and include any unanticipated changes that increase the cost of issuance (such as a withholding tax where the bank is required to gross-up payments to investors).
- <sup>79</sup> CAP 10.11 n. 9.
- <sup>80</sup> A FAQ published by the Basel Committee states that use of a broad index as a reference rate is permissible provided that the reference rate does not exhibit significant correlation with the bank's credit standing. Moreover, supervisors may provide guidance on the reference rates permitted in their jurisdictions.
- <sup>81</sup> *BNY Corporate Trustee Services Ltd v. Eurosail-UK-2007-3BL PLC* [2013] 1 W.L.R. 1408.
- <sup>82</sup> Where a bank funds the acquisition of capital instruments issued by it there is an artificial increase in capital that is not matched by any improvement in loss absorbency. The exclusion of such instruments is therefore logical. Reciprocal cross-holdings, where bank A invests in bank B's capital instruments in return for bank B buying bank A's instruments is an example of this form of artificial creation of capital.
- <sup>83</sup> CAP10.11. See also FAQ 17 expressly prohibiting this.
- <sup>84</sup> CAP 10.11(11).
- <sup>85</sup> CAP 10.11(16).
- <sup>86</sup> There are many reasons for not issuing shares in a subsidiary bank including the creation of minority interests in a formerly wholly owned subsidiary, and possible tax de-recognition of the group.
- <sup>87</sup> See FAQ 22: "[t]emporary writedown mechanisms cannot meet this requirement".
- <sup>88</sup> FAQ 18 states that the jurisdiction of the consolidating supervisor must have the power to trigger a write-down or conversion. This does not state that such power should be exercisable in *the subsidiary* if it is considered by the consolidating parent supervisor to be non-viable.
- <sup>89</sup> See FAQ 19 stating that "[b]anks should seek advice from their relevant national authority if they have questions about national implementation".
- <sup>90</sup> CAP 10.12.
- <sup>91</sup> Pursuant to the EU Bank Recovery and Resolution Directive (Directive 2014/59/EU, (2014) O.J. L173/190, 12.6.2014) as amended.
- <sup>92</sup> Premium not eligible for inclusion in Tier 1 capital may be treated as Tier 2 capital if the instruments meet the criteria for inclusion as Tier 2 capital.
- <sup>93</sup> CAP 10.14.
- <sup>94</sup> CAP 10.18.
- <sup>95</sup> CAP 10.19.
- <sup>96</sup> CAP 10.16.
- <sup>97</sup> Must pay preference shares are treated as Tier 2 capital, although we see no particular reason why a bank would desire to issue such instruments, as opposed to standard Tier 2 debt, as they are not tax deductible.
- <sup>98</sup> Presumably, this also applies to non-deposit taking financial subsidiaries as well.
- <sup>99</sup> CAP 10.16.
- <sup>100</sup> CAP 10.20.
- <sup>101</sup> CAP 10.21.
- <sup>102</sup> CAP 10.23.
- <sup>103</sup> CAP 10.24.
- <sup>104</sup> CAP 10.26.
- <sup>105</sup> CAP 30.7. This treatment applies regardless of whether banks use the equity method for accounting for significant investments.

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- 106 CAP 30.8.  
107 CAP 30.9.  
108 *Ibid.*  
109 CAP 30.9 FAQ 3.  
110 CAP 30.10.  
111 CAP 30.11.  
112 CAP 30.12.  
113 CAP 30.13.  
114 CAP 30.14.  
115 CAP 30.15.  
116 CAP 30.16.  
117 CAP 30.17.  
118 CAP 30.16.  
119 CAP 30.18.  
120 CAP 30.19.  
121 CAP 30.18.  
122 *Ibid.*  
123 CAP 30.20.  
124 *Ibid.*  
125 *Ibid.*  
126 This is to be defined by national supervisors.  
127 CAP 30.21.  
128 CAP 30.26.  
129 CAP 30.25.  
130 CAP 30.26.  
131 CAP 30.23.  
132 CAP 30.24.  
133 CAP 30.26.  
134 CAP 30.27.  
135 CAP 30.28.  
136 CAP 30.22.  
137 CAP 30.29 n 9.  
138 CAP 30.31.  
139 CAP 30.30.  
140 CAP 30.29.  
141 CAP 30.33.  
142 CAP 30.32.  
143 CAP 30.33 FAQ 1.  
144 CAP 30.34.  
145 CRE 20.1(1).  
146 This is not to say that lending institutions that originated low quality household mortgages which were retained on their own balance sheet did not fail in the crisis. However, the problem lay in the US mortgage market as it developed in the 2000s and does not imply a systemic failure of rating agencies.  
147 CRE 20.1 n. 1.  
148 CRE 20.4.  
149 CRE 20.5.  
150 *Ibid.*  
151 CRE 20.6.  
152 CRE 20.8.  
153 CRE 20.7.  
154 Available at [OECD homepage](#).  
155 CRE 20.9.  
156 CRE 20.11.  
157 CRE 20.12.  
158 CRE 20.12 n. 7(c).  
159 The EFSF is in run-off and continues to refinance borrowings used to make term loans to Greece, Ireland and Portugal. It will close once these loans are repaid.  
160 CRE 20.10. Whether this is really appropriate for the ESM and EFSF given their structure and liabilities may be questioned.  
161 CRE 20.14.  
162 CRE 20.15.  
163 CRE 20.18.  
164 *Ibid.*  
165 CRE 20.20 with CRE 20.18 n. 13.  
166 CRE 20.19.  
167 CRE 20.18.  
168 CRE 20.21.  
169 *Ibid.*  
170 CRE 20.21 n. 15.  
171 CRE 20.22.  
172 CRE 20.23.  
173 CRE 20.24.  
174 CRE 20.25.  
175 CRE 20.26.

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- <sup>176</sup> CRE 20.27.  
<sup>177</sup> CRE 20.28.  
<sup>178</sup> CRE 20.29. In practice, we expect any bank that received such an assessment by its auditors would fail as no other banks would extend it credit.  
<sup>179</sup> CRE 20.30.  
<sup>180</sup> CRE 20.32.  
<sup>181</sup> CRE 20.33.  
<sup>182</sup> CRE 20.34.  
<sup>183</sup> CRE 20.35 and CRE 20.36.  
<sup>184</sup> CRE 20.37.  
<sup>185</sup> CRE 20.38.  
<sup>186</sup> *Ibid.*  
<sup>187</sup> CRE 20.39.  
<sup>188</sup> CRE 20.40.  
<sup>189</sup> Currently, investment firms regulated by the FCA are subject to equivalent requirements, and PRA-regulated investment firms to identical requirements. This was required by EU law through the decision of the EU to extend banking prudential regulation to investment firms.  
<sup>190</sup> Only if such exposures qualify as a bank exposure or an exposure to a securities firm would the corporate treatment not apply. In the UK insurance companies cannot be a bank as they have no licence to accept deposits from the public.  
<sup>191</sup> CRE20.41.  
<sup>192</sup> CRE 20.43.  
<sup>193</sup> CRE 20.42.  
<sup>194</sup> CRE 20.44.  
<sup>195</sup> *Ibid.*  
<sup>196</sup> CRE 20.46.  
<sup>197</sup> *Ibid.*  
<sup>198</sup> *Ibid.*  
<sup>199</sup> CRE 20.48.  
<sup>200</sup> CRE 20.49.  
<sup>201</sup> CRE 20.50.  
<sup>202</sup> CRE 20.51.  
<sup>203</sup> CRE 20.52.  
<sup>204</sup> CRE 20.47.  
<sup>205</sup> CRE 20.53.  
<sup>206</sup> *Ibid.*  
<sup>207</sup> CRE 20.60.  
<sup>208</sup> *Ibid.*  
<sup>209</sup> This cannot be determined in accordance with the position of the instrument on the balance sheet as all share capital is accounted for as a liability. It should therefore be understood as being that there is no obligation to make distributions.  
<sup>210</sup> CRE 20.54.  
<sup>211</sup> CRE 20.55. The test under the last indent varies slightly depending on whether the instrument is traded or not.  
<sup>212</sup> CRE 20.56.  
<sup>213</sup> CRE 20.58.  
<sup>214</sup> *Ibid.* n. 25.  
<sup>215</sup> CRE 20.57.  
<sup>216</sup> CRE 20.59.  
<sup>217</sup> CRE 20.61.  
<sup>218</sup> CRE 20.62.  
<sup>219</sup> CRE 20.63.  
<sup>220</sup> *Ibid.*  
<sup>221</sup> CRE 20.64.  
<sup>222</sup> CRE 20.65.  
<sup>223</sup> CRE 20.65 n. 26.  
<sup>224</sup> CRE 20.68(1).  
<sup>225</sup> CRE 20.66.  
<sup>226</sup> *Ibid.*  
<sup>227</sup> CRE 20.68(2).  
<sup>228</sup> CRE 20.67.  
<sup>229</sup> CRE 20.68(3).  
<sup>230</sup> CRE 20.69.  
<sup>231</sup> CRE 20.70.  
<sup>232</sup> CRE 20.71(1).  
<sup>233</sup> CRE 20.71(2).  
<sup>234</sup> In England, a lien is a possessory security interest so this must be interpreted as a mortgage.  
<sup>235</sup> CRE 20.71(3).  
<sup>236</sup> *Ibid.*  
<sup>237</sup> *Downsview Nominees Ltd. v. First City Corporation Ltd.* [1993] A.C. 295.  
<sup>238</sup> See CRE 20.73.  
<sup>239</sup> *Ibid.*  
<sup>240</sup> CRE 20.71.  
<sup>241</sup> CRE 20.77.

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- 242 CRE 20.78.  
243 CRE 20.79.  
244 *Ibid.*  
245 CRE 20.80.  
246 CRE 20.81  
247 CRE 20.72.  
248 CRE 20.74.  
249 *Ibid.*  
250 CRE 20.75 n. 32.  
251 CRE 20.75.  
252 CRE 20.76.  
253 CRE 20.82 - CRE 20.83. The table is set out in CRE 20.82.  
254 CRE 20.83 together with CRE 20.89(1).  
255 CRE 20.83(1).  
256 CRE 20.83(2).  
257 CRE 20.84.  
258 CRE 20.85.  
259 CRE 20.86.  
260 CRE 20.86 n. 38.  
261 CRE 20.87.  
262 CRE 20.87 n. 39.  
263 CRE 20.90.  
264 CRE 20.90 n. 41.  
265 CRE 20.90.  
266 CRE 20.91.  
267 CRE 20.91 n. 42.  
268 CRE 20.88.  
269 CRE 20.89(1).  
270 CRE 20.89(2).  
271 CRE 20.93.  
272 *Ibid.*  
273 CRE 20.102.  
274 CRE 20.103.  
275 It is not thought that the mere filing of an application for a bankruptcy order or a petition for winding up should result in the borrower being considered to be in default. In England the filing of such petitions as a means of putting pressure on a debtor to pay a possibly disputed debt is, in practice, common, even if it is dismissed with costs as would invariably happen where there is a *bona fide* dispute over payment.  
276 CRE 20.104.  
277 CRE 20.105.  
278 CRE 20.107.  
279 CRE 20.106.  
280 CRE 20.106 n. 47.  
281 CRE 20.109.  
282 Under Basel III cash must be interpreted as meaning government-issued media of exchange as this treatment long predates private digital currencies, and the Basel Committee has separately consulted on a possible framework for crypto-assets. Cryptocurrencies cannot therefore constitute cash regardless of whether they are regarded as “money” under national law.  
283 If the bullion is unallocated then under English law the owner may have no proprietary interest in the gold.  
284 What this seems to mean is that if a bank does not have matching gold assets and liabilities, any assets in excess of its liabilities must be risk weighted at 100%.  
285 CRE 20.110(1).  
286 CRE 20.110(2).  
287 CRE 20.110 FAQ1.  
288 CRE 20.94.  
289 The requirements are set out in CRE 20.94 n. 43.  
290 CRE 20.94.  
291 CRE 20.95.  
292 CRE 20.96 and CRE 20.97.  
293 CRE 20.98.  
294 CRE 20.99  
295 CRE 20.100.  
296 CRE 20.101.  
297 CRE 20.101 n. 46.  
298 CRE 21.1.  
299 CRE 21.2.  
300 CRE 21.3 and CRE 21.4.  
301 CRE 21.5  
302 CRE 21.6  
303 CRE 21.7.  
304 CRE 21.8.  
305 CRE 21.9.  
306 CRE 21.10.  
307 CRE 21.11.  
308 CRE 21.12.



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- 309 CRE 21.16.  
310 CRE 21.17.  
311 CRE 21.20.  
312 CRE 21.21.  
313 CRE 90.1.  
314 CRE 30.4.  
315 *Ibid.*  
316 CRE 30.8.  
317 CRE 30.32(1).  
318 CRE 30.32(2).  
319 CRE 30.32(3).  
320 CRE 30.33.  
321 CRE 30.34(1).  
322 CRE 30.35.  
323 CRE 30.34(2).  
324 CRE 30.34.  
325 CRE 31.1.  
326 CRE 35.  
327 CRE 30.45.  
328 *Ibid.*  
329 CRE 30.45.  
330 CRE 30.46.  
331 CRE 30.47.  
332 *Ibid.*  
333 CRE 30.48.  
334 CRE 30.49.  
335 CRE 30.50.  
336 CRE 30.51.  
337 CRE 32.1.  
338 CRE 36.6.  
339 CRE 36.18.  
340 CRE 36.76.  
341 CRE 32.5.  
342 CRE 36.89.  
343 CRE 32.32 and CRE 32.33.  
344 *Ibid.*  
345 CRE 32.36.  
346 *Ibid.*  
347 *Ibid.*  
348 CRE 32.44.  
349 *Ibid.*  
350 CRE 32.45.  
351 *Ibid.*  
352 CRE 32.46.  
353 *Ibid.*  
354 CRE 32.51.  
355 CRE 32.52.  
356 CRE 32.53.  
357 CRE 32.47.  
358 CRE 32.48.  
359 CRE 36.3.  
360 CRE 36 *passim*.  
361 CRE 36.4.  
362 CRE 36.11.  
363 CRE 36.12. This also sets out limited exceptions.  
364 CRE 36.13.  
365 CRE 36.15.  
366 CRE 36.64.  
367 CRE 36.65.  
368 CRE 36.10.  
369 CRE 36.60.  
370 CRE 36.61.  
371 CRE 36.87 and CRE 36.98.  
372 CRE 36.57.  
373 CRE 36.40.  
374 CRE 36.41.  
375 CRE 36.54.  
376 CRE 36.55.  
377 CRE 36.59.  
378 CRE 30.3.  
379 CRE 30.4.  
380 CRE 30.6.  
381 *Ibid.*  
382 CRE 31.8.

- 383 CRE 31.9.  
384 CRE 36.19.  
385 CRE 36.20.  
386 CRE 36.26.  
387 CRE 32.3.  
388 CRE 36.29 and CRE 36.63.  
389 CRE 36.30.  
390 CRE 32.4.  
391 CRE 32.3.  
392 CRE 36.78.  
393 CRE 32.6.  
394 CRE 32.7.  
395 *Ibid.*  
396 CRE 31.5.  
397 CRE 31.8.  
398 CRE 31.5.  
399 CRE 32.33.  
400 CRE 30.33.  
401 Mainly CRE 36.  
402 CRE 31.5 and CRE 31.6.  
403 CRE 32.36.  
404 *Ibid.*  
405 CRE 36.61.  
406 Seven years under CRE 36.87 and CRE 36.98. A five year period applies to retail exposures: CRE 36.88 and 36.99.  
407 The list is set out in CRE 20.10 and includes the EU.  
408 CRE 30.17.  
409 CRE 32.6.  
410 CRE 32.4.  
411 CRE 30.18.  
412 *Ibid.*  
413 *Ibid.* referencing CRE 20.40.  
414 CRE 30.18.  
415 *Ibid.*  
416 CRE 32.4.  
417 CRE 31.7(1).  
418 CRE 31.7(2).  
419 CRE 32.6.  
420 *Ibid.*  
421 CRE 30.34(2).  
422 CRE 36.17 n. 2.  
423 CRE 30.42, CRE 32.58 and CRE 36.17.  
424 CRE 30.19.  
425 CRE 30.20(1).  
426 CRE 30.20(2).  
427 *Ibid.*  
428 CRE 30.20(3).  
429 CRE 30.22.  
430 CRE 30.20(3).  
431 CRE 30.22(2).  
432 CRE 30.20 n. 2.  
433 CRE 30.21.  
434 CRE 30.23.  
435 CRE 30.20(2) and CRE 30.23(1).  
436 CRE 30.24.  
437 *Ibid.*  
438 The reference given in the Basel III text is to CRE 20.64, although this must be a mistake as "transactors" are defined in CRE 20.66 and the remainder of CRE 30.25 makes clear that this definition is intended.  
439 CRE 30.25.  
440 CRE 30.42.  
441 CRE 32.58.  
442 CRE 32.59.  
443 CRE 32.58.  
444 CRE 23.16.  
445 CRE 36.17.  
446 CRE 36.43.  
447 CRE 32.58.  
448 CRE 31.13.  
449 CRE 31.14.  
450 CRE 31.15.  
451 CRE 31.16.  
452 CRE 32.58.  
453 CRE 31.14 to CRE 31.16.  
454 CRE 32.63.

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- 455 CRE 32.64.  
456 CRE 32.65.  
457 CRE 32.67.  
458 CRE 36.68.  
459 CRE 36.68 n. 5.  
460 CRE 36.69.  
461 CRE 36.70.  
462 CRE 36.71.  
463 CRE 30.8.  
464 CRE 30.40 and CRE 30.41.  
465 CRE 30.40.  
466 CRE 30.39.  
467 *Ibid.*  
468 CRE 30.7.  
469 CRE 30.34(1).  
470 CRE 30.9.  
471 CRE 33.2.  
472 CRE 33.3.  
473 See CRE 33.13.  
474 CRE 33.2.  
475 CRE 33.4.  
476 CRE 33.8.  
477 CRE 33.9.  
478 CRE 33.10.  
479 CRE 30.11.  
480 See CRE 33.15.  
481 CRE 30.12.  
482 *Ibid.*  
483 CRE 30.13.  
484 CRE 33.16.  
485 CRE 30.14.  
486 *Ibid.*  
487 See CRE 33.14.  
488 CRE 30.15.  
489 CRE 30.15(3).  
490 CRE 30.16.  
491 CRE 30.40 and CRE 30.41.  
492 CRE 31.11.  
493 CRE 33.5.  
494 See CRE 33.14.  
495 CRE 33.7.  
496 CRE 33.8.  
497 CRE 33.11.  
498 CRE 33.12.  
499 CRE 31.3.  
500 CRE 30.26 incorporating by reference the definition in CRE 20.54.  
501 CRE 30.26 incorporating by reference CRE 20.55.  
502 CRE 30.26 incorporating by reference CRE 20.56.  
503 CRE 30.43.  
504 CRE 30.27.  
505 CRE 30.28.  
506 CRE 30.29.  
507 CRE 30.30.  
508 CRE 30.30 n. 4.  
509 CRE 30.44.  
510 CRE 34.1.  
511 CRE 34.2.  
512 *Ibid.*  
513 CRE 34.4.  
514 CRE 34.5(2).  
515 CRE 34.5(1)(a).  
516 CRE 34.5(1)(b).  
517 CRE 34.6.  
518 *Ibid.*  
519 *Ibid.*  
520 CRE 34.7.  
521 CRE 34.3.  
522 CRE 34.7.  
523 CRE 34.8 n. 2.  
524 CRE 34.8.  
525 CRE 34.8(1).  
526 CRE 34.8(2).  
527 CRE 34.9.  
528 CRE 34.10.

- 529 CRE 34.11.  
530 CRE 35.2.  
531 CRE 35.3.  
532 CRE 35.4.  
533 CRE 35.6.  
534 CRE 35.7.  
535 CRE 35.8.  
536 CAP 30.13.  
537 CAP 10.19.  
538 CRE 35.9.  
539 CAP 30.13.  
540 CRE 40.36.  
541 CRE 90.2.  
542 *Ibid.*  
543 CRE 90.3.  
544 CRE 22.6.  
545 CRE 22.3.  
546 CRE 22.5.  
547 CRE 22.8 (standardised approach); CRE 32.14 and CRE 32.26 (IRB approach).  
548 CRE 22.9 (standardised approach) ; CRE 36.105, CRE 36.110, CRE 36.112, CRE 36.115, CRE 36.128, 36.131(1),  
36.134, CRE 36.135, and CRE 36.136 (IRB approach).  
549 CRE 22.7.  
550 CRE 22.16.  
551 CRE 22.26.  
552 *Ibid.*  
553 CRE 22.7.  
554 CRE 22.27.  
555 CRE 22.29.  
556 CRE 22.3.  
557 CRE 22.5.  
558 CRE 22.18.  
559 CRE 22.19.  
560 CRE 22.20.  
561 Cash-funded credit-linked notes issued by the bank against exposures in the banking book that meet the criteria  
for credit derivatives are treated as cash collateralised: CRE 22.34 n. 3.  
562 CRE 22.34.  
563 CRE 22.45.  
564 CRE 22.35.  
565 CRE 22.32.  
566 CRE 22.33.  
567 CRE 22.15.  
568 CRE 22.36.  
569 CRE 22.38.  
570 CRE 22.37.  
571 CRE 22.39.  
572 See CRE 22.40.  
573 CRE 22.46.  
574 CRE 22.15, CRE 22.43, CRE 22.52 and CRE 22.82-22.83.  
575 CRE 22.41.  
576 CRE 22.42.  
577 CRE 22.48.  
578 CRE 22.49.  
579 CRE 22.50.  
580 CRE 22.57.  
581 CRE 22.59.  
582 CRE 22.60.  
583 CRE 22.62.  
584 CRE 22.63.  
585 CRE 22.64-22.65.  
586 CRE 22.68.  
587 CRE 22.68.  
588 CRE 22.69.  
589 *Ibid.*  
590 This is the case notwithstanding the clear legal differences between a guarantee and a contract of credit  
insurance.  
591 CRE 22.23.  
592 CRE 22.23.  
593 This is stated to include the Bank for International Settlements, the IMF, the ECB, the EU, the ESM, the EFSF  
and MDBs attracting a 0% risk weight under the standardised approach: CRE 22.76 n. 10.  
594 Defined in Basel III as "a legal entity supervised by a regulator that imposes prudential requirements consistent  
with international norms or a legal entity (parent company or subsidiary) included in a consolidated group  
where any substantial legal entity in the consolidated group is supervised by a regulator that imposes prudential  
requirements consistent with international norms". Specific examples given are insurance companies,  
brokers/dealers, thrifts and futures commission merchants: CRE 22.76 n. 11.

- 595 CRE 22.76.  
596 CRE 22.84.  
597 *Ibid.*  
598 An example could be a guarantee provided by a pure holding company of the obligations of its operating subsidiaries.  
599 CRE 22.76(3)(b).  
600 CRE 22.71.  
601 Under English law a guarantee proper is a secondary obligation contingent on a default by the primary obligor. However, this can be avoided by drafting the “guarantor’s” obligation as a primary payment obligation.  
602 CRE 22.73.  
603 This is a slightly anomalous test as generally credit default swaps will have fewer exceptions to payment than under a guarantee or a credit insurance policy. The major exception in some cases is restructuring, which is separately addressed.  
604 CRE 22.77.  
605 CRE 22.74(1).  
606 CRE 22.75.  
607 CRE 22.74(3).  
608 CRE 22.74(5).  
609 CRE 22.74(4).  
610 CRE 22.74 FAQ 1.  
611 CRE 22.74(6).  
612 CRE 22.74(7).  
613 CRE 22.79.  
614 CRE 22.80.  
615 CRE 22.81.  
616 CRE 22.78.  
617 CRE 22.82.  
618 CRE 22.10.  
619 CRE 22.14.  
620 CRE 22.11.  
621 CRE 22.12.  
622 CRE 22.13.  
623 CRE 22.8.  
624 *Ibid.*  
625 CRE 32.8.  
626 CRE 32.9.  
627 CRE 32.10.  
628 CRE 36.133.  
629 CRE 36.134 - CRE 376.137.  
630 CRE 36.138.  
631 CRE 36.129.  
632 CRE 36.130.  
633 CRE 36.130 n. 10.  
634 CRE 36.131.  
635 CRE 36.132.  
636 CRE 36.143.  
637 CRE 36.144.  
638 CRE 32.11.  
639 CRE 32.10.  
640 CRE 32.11.  
641 CRE 32.12.  
642 CRE 32.14.  
643 CRE 32.30.  
644 CRE 32.23.  
645 *Ibid.*  
646 CRE 32.24(1).  
647 *Ibid.*  
648 CRE 32.24(2).  
649 CRE 32.25.  
650 CRE 32.26.  
651 CRE 32.56.  
652 CRE 32.15.  
653 CRE 32.16.  
654 *Ibid.*  
655 *Ibid.*  
656 CRE 32.17.  
657 CRE 32.18.  
658 CRE 36.83-CRE 36.85.  
659 CRE 36.85.  
660 CRE 36.89.  
661 CRE 32.27.  
662 CRE 32.28, CRE 36.105 and CRE 36.110.  
663 CRE 36.105.  
664 CRE 36.102.

- 665 CRE 36.100.  
666 CRE 32.28 and CRE 36.104. Banks must have clearly specified criteria for the types of guarantors it will recognise: CRE 36.104.  
667 CRE 32.28.  
668 CRE 32.58. The 5% floor on LGD for retail exposures applies regardless of the level of collateral provided: CRE 32.59.  
669 CRE 32.60.  
670 *Ibid.*  
671 CRE 32.63.  
672 CRE 34.12.  
673 *Ibid.*  
674 *Ibid.*  
675 CRE 34.12 n. 3.  
676 *Revisions to the Basel Securitisation Framework, 2012, p. 5.*  
677 CRE 40.42, CRE 40.43 and CRE 40.45.  
678 CRE 40.41.  
679 CRE 40.1.  
680 CRE 40.4.  
681 CRE 40.2.  
682 CRE 40.3.  
683 CRE 40.5.  
684 CRE 40.7.  
685 CRE 40.8.  
686 CRE 40.10.  
687 CRE 40.11.  
688 CRE 40.9.  
689 CRE 40.12.  
690 *Ibid.*  
691 CRE 40.13.  
692 CRE 40.14.  
693 CRE 40.18.  
694 CRE 40.18(2).  
695 CRE 40.18(1).  
696 CRE 40.18(3).  
697 CRE 40.19.  
698 CRE 40.20(1).  
699 CRE 40.20(2).  
700 CRE 20.100.  
701 CRE 40.21.  
702 CRE 40.22.  
703 The Basel III text refers to the euro, but this is for illustrative purposes only: CRE 40.22 n. 2.  
704 CRE 40.22(1).  
705 CRE 40.22(2).  
706 CRE 40.23.  
707 *Ibid.*  
708 *Ibid.*  
709 CRE 40.24.  
710 CRE 40.25.  
711 CRE 40.26.  
712 CRE 40.27.  
713 CRE 40.9.  
714 CRE 40.29.  
715 CRE 40.28.  
716 This is because exercise of a clean-up call in these circumstances, even if otherwise permitted, *will* reduce losses to investors or providers of credit protection.  
717 CRE 40.31.  
718 CRE 40.32.  
719 CRE 40.33.  
720 *Ibid.*  
721 CRE 40.34.  
722 CRE 40.35.  
723 CRE 40.37.  
724 BCBS, *Revisions to the Securitisation Framework, December 2013.*  
725 CRE 40.50.  
726 CRE 40.51.  
727 CRE 40.52.  
728 *Ibid.*  
729 CRE 40.53.  
730 CRE 40.54(1)(a).  
731 CRE 40.54(1)(b).  
732 CRE 40.54(2)(a)-(b).  
733 CRE 40.54(2)(c).  
734 CRE 40.55.  
735 CRE 40.42.

- 736 CRE 40.43 cross-referring to CRE 42.8-42.10.  
737 CRE 40.44.  
738 CRE 40.45.  
739 CRE 40.41.  
740 CRE 40.47.  
741 CRE 40.38.  
742 CRE 40.39.  
743 CRE 40.39 n. 4.  
744 CRE 40.39.  
745 CRE 40.40  
746 CRE 40.48.  
747 CRE 40.49.  
748 CRE 40.56(1).  
749 CRE 40.56(2)-(3).  
750 CRE 40.56(1).  
751 CRE 40.56(2)-(3).  
752 CRE 40.57.  
753 CRE 40.58.  
754 CRE 40.59.  
755 CRE 40.60.  
756 CRE 40.61.  
757 CRE 40.62.  
758 CRE 40.67.  
759 CRE 40.68.  
760 Of course, if the securitisation is not STC compliant then it should be sufficient to state this fact with a brief explanation, unless the nature of the securitisation is such that it could never be an STC securitisation e.g. a synthetic securitisation.  
761 CRE 40.69.  
762 CRE 40.70.  
763 *Ibid.*  
764 CRE 40.73.  
765 CRE 40.73(1).  
766 CRE 40.74.  
767 CRE 40.74(2).  
768 CRE 40.74.  
769 CRE 40.74(1).  
770 CRE 40.74(2).  
771 CRE 40.74(1).  
772 CRE 40.75(1).  
773 CRE 40.75(3).  
774 CRE 40.75(2).  
775 CRE 40.76.  
776 CRE 40.76(1).  
777 CRE 40.76(2).  
778 CRE 40.77.  
779 CRE 40.94.  
780 CRE 40.95.  
781 CRE 40.95 n. 25.  
782 We assume this should not be interpreted literally as there will always be some unenforceable obligations in a pool owing to e.g. a failure to comply strictly with consumer credit laws. The Basel Committee cannot have intended to ban retail securitisations from eligibility as an STC securitisation.  
783 Under English law a true sale will place the assets beyond the reach of the originator. Re-characterisation or clawback are not material risks in England.  
784 CRE 40.78.  
785 CRE 40.79.  
786 CRE 40.79 n. 18.  
787 CRE 40.80.  
788 CRE 40.80 n. 19.  
789 CRE 40.81.  
790 CRE 40.82.  
791 CRE 40.83.  
792 *Ibid.*  
793 CRE 40.86.  
794 CRE 40.87.  
795 CRE 40.84.  
796 CRE 40.85.  
797 CRE 40.88.  
798 CRE 40.89.  
799 CRE 40.90.  
800 CRE 40.91.  
801 CRE 40.92.  
802 *Bristol & West Building Society v. Mothew* [1998] Ch. 1.  
803 *Prince Jeffrey Bolkuah v. KPMG* [1999] 2 A.C. 222.  
804 *Boardman v. Phipps* [1967] 2 A.C. 46.

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- 805 CRE 40.92.  
806 CRE 40.93.  
807 CRE 40.93(2).  
808 CRE 40.93.  
809 CRE 40.96.  
810 CRE 40.98.  
811 CRE 40.97.  
812 CRE 40.100.  
813 CRE 40.99.  
814 *Ibid.*  
815 *Ibid.*  
816 CRE 40.101.  
817 CRE 40.105.  
818 CRE 40.106.  
819 CRE 40.107.  
820 CRE 40.108-40.109.  
821 CRE 40.110.  
822 CRE 40.111.  
823 CRE 40.112.  
824 CRE 40.113.  
825 CRE 40.114.  
826 CRE 40.116.  
827 CRE 40.117.  
828 CRE 40.118.  
829 CRE 40.118 n. 33.  
830 CRE 40.119.  
831 CRE 40.120.  
832 CRE 40.122.  
833 CRE 40.123.  
834 CRE 40.123-CRE 40.126.  
835 CRE 40.127.  
836 CRE 40.127 n. 35.  
837 CRE 40.127.  
838 *Ibid.*  
839 CRE 40.129.  
840 *Ibid.*  
841 CRE 40.131.  
842 CRE 40.128.  
843 CRE 40.130.  
844 CRE 40.132.  
845 CRE 40.133.  
846 CRE 40.134 and CRE 40.135.  
847 CRE 40.136.  
848 CRE 40.138.  
849 CRE 40.139.  
850 *Ibid.*  
851 CRE 40.140.  
852 CRE 40.141.  
853 CRE 40.142.  
854 CRE 40.143.  
855 CRE 40.137.  
856 *Ibid.*  
857 *Ibid.*  
858 **Commercial Paper Rates and Outstanding Summary.**  
859 Article 9 of the Financial Services and Markets Act 2000 (Regulated Activities) Order SI 2001/544 (as amended) defines commercial paper as debt securities with a maturity of less than one year.  
860 CRE 40.144.  
861 CRE 40.145.  
862 CRE 40.146.  
863 Securitisations may be bespoke with unique features on which there is no established market practice.  
864 CRE 40.149.  
865 CRE 40.150.  
866 CRE 40.151.  
867 *Ibid.*  
868 CRE 40.154 as applied by CRE 40.152.  
869 CRE 40.152.  
870 CRE 40.153.  
871 CRE 40.154.  
872 CRE 40.156.  
873 CRE 40.157.  
874 CRE 40.158 and CRE 40.159.  
875 CRE 40.160.  
876 CRE 40.161.  
877 CRE 40.162.



- 878 CRE 40.163.  
 879 CRE 40.164.  
 880 CRE 40.165.  
 881 CRE 40.165 n. 39.  
 882 CRE 41.1.  
 883 CRE 41.1.  
 884 CRE 41.2.  
 885 *Ibid.*  
 886 CRE 41.3 n. 1.  
 887 CRE 41.3.  
 888 CRE 41.3 n. 2.  
 889 CRE 41.4.  
 890 CRE 41.5.  
 891 CRE 41.6.  
 892 Under English law foreclosure refers to a process whereby the equity of redemption of the mortgagor is extinguished and the entire estate in land is vested in the mortgagee. It is inherent in any mortgage. However, given the equitable right to relief from forfeiture, in any case where the equity of redemption has economic value (i.e. the value of the land in a public sale will exceed the mortgage debt) the court will order the land to be sold. For this reason it is considered that in the Basel III text “foreclosure” is not confined to the strict legal procedure, but also includes any process to sell the land in order to repay the mortgage debt.  
 893 CRE 41.7.  
 894 CRE 41.8.  
 895 CRE 41.9.  
 896 CRE 41.10.  
 897 CRE 41.12.  
 898 CRE 41.16(3).  
 899 CRE 41.22(3).  
 900 CRE 41.13.  
 901 CRE 41.14.  
 902 CRE 41.15.  
 903 *Ibid.*  
 904 CRE 41.21.  
 905 CRE 41.22.  
 906 CRE 41.16.  
 907 CRE 41.17.  
 908 CRE 41.18.  
 909 CRE 41.19.  
 910 CRE 42.1.  
 911 CRE 42.2.  
 912 CRE 42.3.  
 913 CRE 42.4.  
 914 CRE 42.5.  
 915 *Ibid.*  
 916 CRE 42.6.  
 917 CRE 42.7.  
 918 CRE 42.8 n. 2 seems to permit ratings that are not publicly available free of charge provided that the ECAI provides an adequate justification in accordance with the IOSCO *Code of Conduct Fundamentals for Credit Rating Agencies*.  
 919 CRE 42.8(7).  
 920 CRE 42.9.  
 921 CRE 42.10(1).  
 922 CRE 42.10(2).  
 923 CRE 42.10(3).  
 924 CRE 42.10(4).  
 925 CRE 42.11.  
 926 CRE 42.12.  
 927 CRE 42.13.  
 928 CRE 42.14.  
 929 CRE 44.1.  
 930 *Ibid.*  
 931  $K_{IRB}$  includes the unexpected loss *and* the expected loss on defaulted exposures: CRE 44.2 n. 1.  
 932 CRE 44.2.  
 933 CRE 44.3.  
 934 CRE 44.4.  
 935 CRE 44.5.  
 936 CRE 44.6.  
 937 CRE 44.8.  
 938 CRE 44.9.  
 939 CRE 44.10.  
 940 CRE 44.11.  
 941 CRE 44.12.  
 942 See CRE 99.4 - CRE 99.8.  
 943 CRE 44.13.  
 944 CRE 44.14.

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- 945 *Ibid.*  
946 CRE 44.15.  
947 *Ibid.*  
948 CRE 44.16.  
949 CRE 44.17.  
950 *Ibid.*  
951 CRE 44.17(6).  
952 CRE 44.18.  
953 CRE 44.19.  
954 CRE 44.20.  
955 CRE 44.21.  
956 *Ibid.*  
957 *Ibid.*  
958 CRE 44.22.  
959 CRE 44.23.  
960 CRE 44.23(5).  
961 CRE 44.24(3).  
962 CRE 44.25.  
963 CRE 44.26.  
964 CRE 44.28.  
965 CRE 44.29.  
966 CRE 43.1.  
967 CRE 43.2(4).  
968 CRE 43.2.  
969 CRE 43.3.  
970 CRE 43.4.  
971 CRE 45.1.  
972 CRE 45.2.  
973 *Ibid.*  
974 CRE 45.4.  
975 CRE 45.5.  
976 CRE 45.6.  
977 CRE 45.7.  
978 CRE 70.8.  
979 CRE 70.3.  
980 CRE 70.5.  
981 CRE 70.6.  
982 CRE 70.7.  
983 CRE 70.9.  
984 CRE 70.10.  
985 CRE 70.10 n. 2.  
986 CRE 70.10(1).  
987 CRE 70.10(2).  
988 CRE 70.11.  
989 CRE 70.8.  
990 CRE 70.12.  
991 CRE 60.1.  
992 *Ibid.*  
993 CRE 60.11.  
994 CRE 60.12.  
995 CRE 60.2.  
996 CRE 60.3.  
997 *Ibid.*  
998 CRE 60.3 n. 1.  
999 CRE 60.4.  
1000 CRE 60.4.  
1001 CRE 60.4.  
1002 CRE 60.5 n. 3.  
1003 CRE 60.7 n. 4.  
1004 CRE 60.7(1).  
1005 CRE 60.7(2).  
1006 CRE 60.7(3).  
1007 CRE 60.15.  
1008 CRE 60.16.  
1009 CRE 60.15.  
1010 CRE 60.14.  
1011 CRE 60.9.  
1012 CRE 60.10.  
1013 CRE 50.1.  
1014 CRE 51.3(1).  
1015 CRE 51.3(2).  
1016 CRE 51.3(3).  
1017 CRE 51.3(4).  
1018 CRE 51.4.

- 1019 CRE 51.5.  
1020 CRE 51.6.  
1021 See The Over the Counter Derivatives, Central Counterparties and Trade Repositories (Amendment, etc., and Transitional Provisions)(EU Exit)(No 2) Regulations 2019 SI 2019/1416 as amended by SI 2020/646 and SI 2020/1385.  
1022 CRE 51.8.  
1023 CRE 51.9.  
1024 CRE 51.10.  
1025 CRE 51.16.  
1026 CRE 50.12.  
1027 CRE 50.13.  
1028 *Ibid.*  
1029 CRE 50.14.  
1030 CRE 50.15.  
1031 In England this was affirmed by the House of Lords in *British Eagle International Air Lines Ltd. v. Cie Nationale Air France* [1975] 1 W.L.R. 758. Numerous work-arounds exist including that upheld by the High court of Australia in *IATA v. Ansett Australia Holdings Ltd.* (2008) 234 C.L.R. 151.  
1032 CRE 50.16.  
1033 CRE 50.17.  
1034 CRE 50.18.  
1035 CRE 50.19.  
1036 CRE 50.20.  
1037 *Ibid.*  
1038 CRE 50.21.  
1039 CRE 51.7 n. 3.  
1040 CRE 51.11.  
1041 CRE 51.12.  
1042 CRE 51.13.  
1043 CRE 51.15.  
1044 CRE 52.1.  
1045 *Ibid.*  
1046 CRE 52.7.  
1047 *Ibid.*  
1048 CRE 52.7 n. 1. Such clauses are thought to be enforceable in England under the principles set out in *Money Markets International Stockbrokers Ltd. v. London Stock Exchange Ltd.* [2002] 1 W.L.R. 1150.  
1049 CRE 52.7.  
1050 *British Eagle International Air Lines Ltd. v. Cie Nationale Air France* [1975] 1 W.L.R. 758.  
1051 BCCI was incorporated in Luxemburg but carried on the preponderance of its banking business through branches located in England. As both Luxemburg and England look to the place of incorporation the analogy is not perfect, although the real location of its business was in England, as demonstrated by the findings of the *Inquiry into the Supervision of The Bank of Credit and Commerce International*, 1992 (the Bingham Report). In 1995 the EU adopted the Post-BCCI Directive (Directive 95/26/EC of 29 June 1995 amending certain directives with a view to reinforcing prudential supervision (1995) O.J. L168/7, 18.7.1995)). The current requirements are now set out in Directive 2013/36/EU (CRD IV) as amended.  
1052 CRE 52.8.  
1053 CRE 52.1.  
1054 CRE 52.2.  
1055 *Ibid.*  
1056 CRE 52.2 FAQ1.  
1057 CRE 52.3.  
1058 CRE 52.4.  
1059 CRE 52.5.  
1060 CRE 52.9.  
1061 CRE 52.10.  
1062 CRE 52.10.  
1063 *Ibid.*  
1064 *Ibid.*  
1065 CRE 52.14.  
1066 CRE 52.16.  
1067 CRE 52.14 n. 4.  
1068 CRE 52.17.  
1069 *Ibid.*  
1070 For example, the *Quistclose* trust: see *Quistclose Investments Ltd v Rolls Razor Ltd (In Voluntary Liquidation)* [1970] A.C. 567.  
1071 CRE 52.17.  
1072 As has been explained, Basel III does not permit walkaway clauses.  
1073 CRE 52.18.  
1074 *Ibid.*  
1075 CRE 52.19.  
1076 CRE 52.20.  
1077 CRE 52.24.  
1078 CRE 52.25.  
1079 CRE 52.26.  
1080 CRE 52.27.

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- 1081 CRE 52.28.  
1082 *Ibid.*  
1083 CRE 52.29.  
1084 *Ibid.*  
1085 CRE 52.30.  
1086 CRE 52.30(1).  
1087 CRE 52.30(1)(a).  
1088 CRE 52.30(1)(b).  
1089 CRE 52.30(1)(c).  
1090 CRE 52.30(1).  
1091 CRE 52.30(2).  
1092 CRE 52.30(3).  
1093 CRE 52.30(4).  
1094 CRE 52.72.  
1095 This is the figure required to be used for all transactions in options, and not a supervisory discretion.  
1096 CRE 52.32.  
1097 CRE 52.21.  
1098 CRE 52.22.  
1099 CRE 52.23.  
1100 *Ibid.*  
1101 CRE 52.3.  
1102 CRE 52.4.  
1103 CRE 52.6.  
1104 CRE 52.1. Confusingly, CRE 52.1 refers to EAD which is an IRB risk parameter. This has been discussed above.  
1105 CRE 52.1 FAQ 1.  
1106 CRE 52.1 FAQ 2.  
1107 CRE 52.1 FAQ 3.  
1108 CRE 53.1.  
1109 *Ibid.*  
1110 *Ibid.*  
1111 *Ibid.*  
1112 CRE 53.2.  
1113 *Ibid.*  
1114 CRE 53.4.  
1115 CRE 53.5. If a bank fails to satisfy the minimum requirements then presumably its regulatory permission to use IMM must be withdrawn by the relevant supervisor.  
1116 CRE 53.3.  
1117 CRE 53.6.  
1118 CRE 55.2.  
1119 CRE 53.6.  
1120 CRE 53.8.  
1121 CRE 53.7.  
1122 CRE 53.9.  
1123 This is the term used by Basel III but this should probably be read as “where relevant”.  
1124 CRE 53.10.  
1125 Basel III defines it as “leptokurtosis” which is unlikely to be helpful to most readers: CRE 53.10.  
1126 CRE 53.11.  
1127 CRE 53.14.  
1128 CRE 53.15.  
1129 The Basel III text refers to counterparty exposure, but it must be CCR exposure that is meant.  
1130 CRE 53.16.  
1131 *Ibid.*  
1132 CRE 53.17 - CRE 53.19.  
1133 CRE 53.28  
1134 CRE 53.13.  
1135 CRE 53.20.  
1136 CRE 53.22.  
1137 *Ibid.*  
1138 CRE 53.23 - CRE 53.27.  
1139 CRE 53.28.  
1140 CRE 53.29.  
1141 CRE 53.29 - CRE 53.33.  
1142 CRE 53.36.  
1143 CRE 53.37.  
1144 CRE 53.38.  
1145 CRE 53.39.  
1146 CRE 53.40.  
1147 CRE 53.41. It is possible that this requirement might be inspired by the collapse of AIG in September 2008, where this was precipitated by margin calls on credit derivatives sold by the insurer. See AR Sorkin, *Too Big to Fail*, Viking Press, 2009.  
1148 CRE 53.43.  
1149 CRE 53.45 - CRE 53.46.  
1150 CRE 53.51.  
1151 CRE 53.56.

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- <sup>1152</sup> CRE 53.47.  
<sup>1153</sup> CRE 53.48.  
<sup>1154</sup> Presumably, exchange-traded derivatives are excluded because they would be closed-out under the default rules of the relevant exchange should a counterparty fail. This is the position in England for recognised investment exchanges, but may be different in other jurisdictions, as the treatment of defaulting members may vary between jurisdictions.  
<sup>1155</sup> CRE 53.62.  
<sup>1156</sup> *Ibid.*  
<sup>1157</sup> CRE 53.63.  
<sup>1158</sup> CRE 53.67.  
<sup>1159</sup> CRE 53.64.  
<sup>1160</sup> CRE 53.64(1).  
<sup>1161</sup> CRE 53.64(2).  
<sup>1162</sup> CRE 53.65.  
<sup>1163</sup> CRE 53.66.  
<sup>1164</sup> CRE 53.69.  
<sup>1165</sup> CRE 53.70.  
<sup>1166</sup> CRE 53.71.  
<sup>1167</sup> CRE 55.1.  
<sup>1168</sup> *Ibid.*  
<sup>1169</sup> CRE 55.2.  
<sup>1170</sup> *Ibid.*  
<sup>1171</sup> *Ibid.*  
<sup>1172</sup> CRE 54.1.  
<sup>1173</sup> CRE 54.52.  
<sup>1174</sup> CRE 50.2.  
<sup>1175</sup> *Ibid.*  
<sup>1176</sup> Section 287(3)(a) Financial Services and Markets Act 2000 and SI 2001/995, Schedule 1, para 7D.  
<sup>1177</sup> See preceding end note and also SI 2001/995, Schedule 1, para 21A.  
<sup>1178</sup> CRE 50.3.  
<sup>1179</sup> CRE 50.3(1).  
<sup>1180</sup> CRE 50.3(2) and CRE 54.37.  
<sup>1181</sup> CRE 50.4.  
<sup>1182</sup> *Ibid.*  
<sup>1183</sup> CRE 50.5.  
<sup>1184</sup> CRE 50.6.  
<sup>1185</sup> CRE 50.7.  
<sup>1186</sup> *Ibid.*  
<sup>1187</sup> *Ibid.*  
<sup>1188</sup> *Ibid.*  
<sup>1189</sup> CRE 50.8.  
<sup>1190</sup> CRE 50.9.  
<sup>1191</sup> CRE 50.10.  
<sup>1192</sup> CRE 54.3.  
<sup>1193</sup> CRE 54.4.  
<sup>1194</sup> CRE 54.5.  
<sup>1195</sup> CRE 54.41.  
<sup>1196</sup> CRE 54.42.  
<sup>1197</sup> CRE 54.7.  
<sup>1198</sup> *Ibid.*  
<sup>1199</sup> CRE 54.8.  
<sup>1200</sup> CRE 54.8(1).  
<sup>1201</sup> CRE 54.8(2).  
<sup>1202</sup> CRE 54.14(1).  
<sup>1203</sup> CRE 54.14(2).  
<sup>1204</sup> CRE 54.14(3).  
<sup>1205</sup> CRE 54.16.  
<sup>1206</sup> CRE 54.17.  
<sup>1207</sup> CRE 54.18.  
<sup>1208</sup> CRE 54.19.  
<sup>1209</sup> *Ibid.*  
<sup>1210</sup> CRE 54.20.  
<sup>1211</sup> CRE 54.21.  
<sup>1212</sup> CRE 54.24.  
<sup>1213</sup> *Ibid.*  
<sup>1214</sup> CRE 54.25.  
<sup>1215</sup> CRE 54.26.  
<sup>1216</sup> *Ibid.*  
<sup>1217</sup> *Ibid.*  
<sup>1218</sup> CRE 54.27.  
<sup>1219</sup> CRE 54.28.  
<sup>1220</sup> *Ibid.*  
<sup>1221</sup> CRE 54.29.  
<sup>1222</sup> *Ibid.*

- 1223 CRE 54.29.
- 1224 CRE 54.29 n. 4.
- 1225 CRE 54.36.
- 1226 CRE 54.36(4).
- 1227 CRE 54.36 n. 5.
- 1228 CRE 54.40.
- 1229 Many derivatives have a long history, with some writers suggesting they were recognised in the laws of Hammurabi. However, only since the 1980s have banks become major players in derivatives markets, and since then new classes of derivatives have been developed, most notably credit and exotic derivatives.
- 1230 Many academics advocate “coherent” measures of risk that satisfy specified criteria as superior. As will be discussed in the text below, VaR may not be “coherent”, whereas ES is. This does not prove ES is necessarily an improvement on VaR in all cases, or that a better risk measure may not be developed.
- 1231 Compare NF Brady, *Report of the Presidential Task Force on Market Mechanisms*, GPO, Washington, 1988 and Nobel laureate MH Miller, *Financial Innovations & Market Volatility*, Blackwell, Oxford, 1991. The near collapse of Long Term Capital Management has been claimed to show the weaknesses of VaR. However, this occurred two years after the Market Risk Amendment was published and seems due to a combination of exogenous (the 1998 Russian sovereign default) and endogenous factors (limitations in the model used, an extremely aggressive approach to market liquidity and a lack of diversity in trading strategies). An earlier shock was the 1971 decision by the Nixon administration to sever the link between the US dollar and gold, effectively ending the post-War Bretton Woods system. However, political risk cannot really be measured, and more properly falls within the category of uncertainty.
- 1232 *Individualism and Economic Order*, Routledge & Keegan Paul, London, 1949.
- 1233 *Lehman Brothers Holdings Scottish LP3 v. Lehman Brothers Holdings PLC* [2021] EWCA Civ. 1523 is the latest case.
- 1234 Obviously, no capital is required to be held against future profits.
- 1235 J Jorion, *Value at Risk*, 3<sup>rd</sup> ed., McGraw Hill, 2007, p. 63. K Dowd and M Hutchinson estimate about every three years: see *Alchemists of Loss*, Wiley, Chichester, 2010, p. 115.
- 1236 K Dowd, J Cotter, C Humphrey and M Woods, *How Unlikely is 25 Sigma?*, mimeo, 2008.
- 1237 See e.g. J Jorion, *Value at Risk*, 3<sup>rd</sup> ed, McGraw Hill, 2007, p. 542. Most writers on VaR make the same point.
- 1238 J Danielsson, *The Emperor Has No Clothes: Limits to Risk Modelling*, Financial Markets Group. LSE, London, 2000, p. 12.
- 1239 A point stressed in his 2007 book, but seemingly written before the financial crisis as it is not mentioned; R Rebonato, *Plight of the Fortune Tellers*, Princeton University Press.
- 1240 *Ibid.*
- 1241 *Ibid* and pp. 21-22.
- 1242 FA Hayek, *Science and Socialism*, American Enterprise Institute, 1979, Washington DC, p. 13.
- 1243 J Kay and M King, *Radical Uncertainty*, The Bridge Street Press, London, 2020.
- 1244 B Mandelbrot and RL Hudson, *The (Mis)Behavior of Markets*, Basic Books, New York, 2004.
- 1245 A good discussion of the theoretical issues involved and possible solutions is set out in K Dowd, *Measuring Market Risk*, 2<sup>nd</sup> ed, Wiley, Chichester, 2005.
- 1246 K Dowd, *Measuring Market Risk*, 2<sup>nd</sup> ed, Wiley, Chichester, 2005 wrote “[f]rom a statistical point of view, copulas offer the universally correct way to estimate risk measures from the position level”, p. 178, and “if we are interested in serious risk aggregation, we have to use copulas”, p. 183. However, in 2010 (after the crisis) he wrote “[t]hough in theory, a copula can accommodate any arbitrary set of imputed distributions for different risk factors, in practice the plausibility of the copula itself is undermined if the underlying distributions are too diverse. Thus, the greater flexibility of the copulas, though helpful, only takes us so far. The more diverse the distributions of underlying risk factors, the less plausible any fit becomes”: n. 18 at p. 122.
- 1247 N Taleb, *The Black Swan*, revised edition, Allen Lane, London, 2011. Taleb’s views on VaR are summarised below.
- 1248 K Dowd and M Hutchinson, *Alchemists of Loss*, Wiley, Chichester, 2010, p. 115.
- 1249 In the event TARP money was used to recapitalise banks and other financial institutions. This does not mean the original stated purpose could not have worked.
- 1250 Financial Times, 13 August 2007.
- 1251 K Dowd, J Cotter, C Humphrey and M Woods, *How Unlikely is 25 Sigma?*, mimeo, 2008.
- 1252 The latest published in 2007 when the financial crisis started.
- 1253 *Ibid.*, p. 572.
- 1254 *Ibid.*
- 1255 *Ibid.* p. 63 n. 12. The crises were the Russian sovereign default and the East Asian financial crises.
- 1256 Citing the Economist, June 12 1999.
- 1257 J Jorion, *Value at Risk*, 3<sup>rd</sup> ed, McGraw Hill, 2007, p. 555.
- 1258 *Ibid.* pp. 555-556.
- 1259 *Ibid.*, p. 556.
- 1260 This is a point stressed by HS Shin in the 2010 Clarendon Lectures in Finance, *Risk and Liquidity*, Oxford University Press, Oxford, 2010.
- 1261 J Jorion, *Value at Risk*, 3<sup>rd</sup> ed, McGraw Hill, 2007. The quotes are from pp. 352-353.
- 1262 HS Shin, *Liquidity and Risk*, Oxford University Press, Oxford, 2010, p. 52.
- 1263 For a discussion of the pros and cons of historical simulations see K Dowd, *Measuring Market Risk*, 2<sup>nd</sup> ed, Wiley, Chichester, pp. 99-101 (where he groups it within a wider class of non-parametric approaches to risk estimation).
- 1264 *Ibid.*, p. 101.
- 1265 J Jorion, *Value at Risk*, 3<sup>rd</sup> ed, McGraw Hill, 2007, pp. 335-339.
- 1266 *Ibid.* see the discussion in chapter 13. The quotation is on p. 355.
- 1267 Whether the Basel Committee’s liquidity standards are the correct way of doing it is another question.

- <sup>1268</sup> J Jorion, *Value at Risk*, 3<sup>rd</sup> ed, McGraw Hill, 2007, p. 338. This is not to deny the underlying cause of poor performance in many business lines hidden through off-balance sheet vehicles and accounting fraud.
- <sup>1269</sup> *Ibid.*, p. 352.
- <sup>1270</sup> HS Shin, *Risk and Liquidity*, Oxford University Press, Oxford, 2010, ch. 8.
- <sup>1271</sup> WD Cohen, *House of Cards*, Doubleday Books, 2009.
- <sup>1272</sup> Lehman Brothers filed for bankruptcy when it ran out of money, could not borrow on any terms, and was denied a Federal bail-out. The reasons for the latter remain disputed to the present day.
- <sup>1273</sup> In an interview with the BBC in 2017 the former Chancellor of the Exchequer, Alistair Darling, said that he received a call from the chairman of RBS in 2008 stating “we’re going to run out of money in the early afternoon”: *The Guardian*, 9 August 2017. This was reported extensively in other media outlets, and in a publication by the House of Commons Library in October 2018.
- <sup>1274</sup> Most of Dowd’s 1998 and 2005 books (next note) are concerned with explaining VaR. However, he also states in *Measuring Market Risk* “[t]he failure of VaR to be subadditive is a fundamental problem because it means that VaR has no claim to be regarded as a ‘proper’ risk measure at all. A VaR is merely a quantile. It has its uses as a quantile, but it is very unsatisfactory as a risk measurement” at p. 34 and he quotes approvingly from C Acerbi, *Coherent Representations of Subjective Risk Aversion*, p. 150, in G Szegö, *Risk Measures for the 21<sup>st</sup> Century*, Wiley, Chichester, 2004 that no supporters of VaR “to the best of our knowledge, has ever tried to write an alternative meaningful and consistent set of axioms for a risk measure which are fulfilled by VaR”, *Ibid.* p. 34. This point is discussed below when considering Artzner’s theory of coherent measures of risk. In the preface to the second edition Dowd writes “Is a VaR measure the best we can do? The answer on no. There are alternatives to VaR and some of these – especially the coherent risk measures – are demonstrably superior”, *Ibid.*, pp. xiii-xiv. Dowd’s *Beyond Value at Risk*, Wiley, Chichester, 1998 does not discuss this question, probably because Artzner’s article was published the following year.
- <sup>1275</sup> See K Dowd, *Measuring Market Risk*, 2<sup>nd</sup> ed, Wiley, Chichester, 2005 and *Beyond Value at Risk*, Wiley, Chichester, 1998. His 2010 book (with M Hutchinson) *Alchemists of Loss*, Wiley, Chichester, is far more critical having been published after the financial crisis, see e.g. pp. 112-117, where the authors conclude “the people using it were not all fools, so one has to ask what purpose the Gaussian VaR models really served. The answer is depressing: if the VaR was to be used to set regulatory capital requirements (which it was), and if the aim of the exercise was to keep these as low as possible (which it also was, with rare exceptions), then the Gaussian VaR was in fact just right after all. But this is not really risk management”, p. 117, and criticises “the VaR risk measure, which peers myopically away from ‘bad days’ and only works when risks are not particularly risky, and to correlation-based risk management strategies that break down when most needed”, p. 403-404. This seems unduly polemical as a risk management tool that works almost all of the time, but fails in a crisis, is not useless for risk management, provided its limitations (which were acknowledged by its advocates) are taken into account. However, it may be unwise to adopt such a measure for regulatory purposes. In this book and in *Capital Inadequacies: the Dismal Failure of the Basel Regime of Bank Capital Regulation*, Policy Analysis No. 681, Cato Institute, 2013 Dowd et al. attribute the many failures they allege concerning the Basel regime to regulatory capture which is a well-known in public choice theory. Dowd criticises the theories of the seven Nobel prize winners whose work underlay what he describes as Modern Financial Theory and which he blames in *Alchemists of Loss* for the financial crisis. The theories were adopted by Wall Street not because they were true “but because the theory served the interests of key industry groups”, p. 6. We express no views on these arguments.
- <sup>1276</sup> In the second edition of *Measuring Market Risk* K Dowd advocates the superiority of “coherent” measures of risk and states that he is “pretty much persuaded by now that the VaR is close to useless as a ‘proper’ risk measure, although that is not to say that the VaR is useless, because it also has its uses as a quantile. However, I also believe that there are major issues with coherent risk measures too: they are far from ‘perfect’ themselves, and there are many unanswered questions about them. At a deeper level, I also believe there are major problems with the application of physical science models to social situations, and I remain extremely sceptical of the financial regulatory system, which I believe has done more harm overall than good” *Ibid.*, pp xvii-xviii. In other words he has no solution, but abandoning attempts at risk management altogether would surely be far worse.
- <sup>1277</sup> K Dowd, *Measuring Market Risk*, 2<sup>nd</sup> ed, Wiley, Chichester, 2005, p. 351.
- <sup>1278</sup> *Ibid.*, p. 363.
- <sup>1279</sup> J Danielsson et al, Special Paper No. 130, Financial Markets Group, LSE, 2001. The authors include Charles Goodhart who was professor of economics at the LSE and a member of the Bank of England’s Monetary Policy Committee.
- <sup>1280</sup> *Ibid.*, p. 11.
- <sup>1281</sup> *Ibid.*, p. 3.
- <sup>1282</sup> *Ibid.*, p. 7.
- <sup>1283</sup> *Ibid.*, p. 5.
- <sup>1284</sup> (1999) 9 *Mathematical Finance* 203.
- <sup>1285</sup> *Ibid.*, p. 209.
- <sup>1286</sup> *Ibid.*, pp 216-218.
- <sup>1287</sup> H Markowitz, *Portfolio Selection* (1952) 7 *The Journal of Finance* 77.
- <sup>1288</sup> *Quantitative Risk Management*, Princeton University Press, 2005.
- <sup>1289</sup> *Ibid.*, p. 242.
- <sup>1290</sup> This was propounded by H Markowitz in *Portfolio Selection* (1952) 7 *Journal of Finance* 77 (for which he was awarded the Nobel Prize in 1990).
- <sup>1291</sup> Compare K Dowd, *Measuring Market Risk*, 2<sup>nd</sup> ed., Wiley, Chichester, 2005 “in the real world non-elliptical distributions are the norm rather than the exception” with J Jorion, *Value at Risk*, 3<sup>rd</sup> ed, McGraw Hill, 200, at p. 114 and n. 4. Jorion further argues that where short selling is allowed where portfolios are correlated the risk, and VaR is zero, whereas if they are negatively uncorrelated, so that losses on one asset are amplified by losses on the other VaR “provides an absolute worst-case scenario for the portfolio at hand”.

- <sup>1292</sup> It is not obvious to the present writer that combining two portfolios should not result in a lower measure of risk, as it depends on correlations between the instruments held in the two portfolios, including differences between the relevant markets. The risk may either increase or decrease, but is unlikely to be identical unless the portfolios are identical and trading conditions identical. Equally, diversification is in general a good risk management strategy. However, it need not be in all cases. For example, a currency trader believing in the collapse of the Euro zone in the foreseeable future, and high inflation in the US and UK might rationally choose to concentrate his exposures in Swiss francs. If it is assumed that the risk of inflation in Switzerland is lower than in other countries this may be better risk management than a diversified portfolio of currencies, or a basket like the SDR. All depends on the assumptions made.
- <sup>1293</sup> Mimeo, 2005.
- <sup>1294</sup> *Ibid.*, p. 12.
- <sup>1295</sup> Cambridge University Press, Cambridge, 2011.
- <sup>1296</sup> In his forward the then Chairman of the Basel Committee, Nout Wellink, states that a “very small minority” of papers were excluded and stressed that the responsibility for the interpretation of the facts and the value judgments about the merits or otherwise of the Committee’s work are those of the author: *Ibid.* p. ix. However, this cannot distract from the argument that the book provides the best explanation of what and why the members of the Committee did in adopting the Market Risk Amendment.
- <sup>1297</sup> *Ibid.*, p. 247.
- <sup>1298</sup> *Ibid.*, p. 248.
- <sup>1299</sup> *Ibid.*, p. 249.
- <sup>1300</sup> *Ibid.*, p. 264.
- <sup>1301</sup> *Ibid.*, pp. 576-577.
- <sup>1302</sup> This is not to say that such arguments have not been advanced, but they make more sense in respect to the internal ratings-based approach to credit risk and the internal assessment approach for operational risk. Only the latter has been withdrawn by Basel III. We express no opinion on such matters.
- <sup>1303</sup> *The Quantitative Modelling of Operational Risk: Between G-and -H and ECT 37* Astin Bulletin No. 2 p. 265.
- <sup>1304</sup> BCBS, *Messages from the Academic Literature on Risk Measurement for the Trading Book*, January 2011, p. 19.
- <sup>1305</sup> *Ibid.*, p. 20.
- <sup>1306</sup> *Ibid.*, p. 3.
- <sup>1307</sup> BCBS, *Fundamental Review of the Trading Book*, May 2012, p. 51.
- <sup>1308</sup> *Ibid.*
- <sup>1309</sup> *Ibid.*, p. 53.
- <sup>1310</sup> *Ibid.*
- <sup>1311</sup> *Ibid.*
- <sup>1312</sup> *Ibid.*
- <sup>1313</sup> *Ibid.*, p. 54.
- <sup>1314</sup> *Ibid.*
- <sup>1315</sup> *Ibid.*
- <sup>1316</sup> *Ibid.*
- <sup>1317</sup> *Ibid.*
- <sup>1318</sup> *Ibid.*, p. 55.
- <sup>1319</sup> *Ibid.*, pp 55-56.
- <sup>1320</sup> *Ibid.*, p. 56.
- <sup>1321</sup> *Ibid.*
- <sup>1322</sup> *Ibid.*
- <sup>1323</sup> *The Run on the Rock*, HC Treasury Select Committee, 5<sup>th</sup> report, session 2007-2008.
- <sup>1324</sup> BCBS, *Fundamental Review of the Trading Book*, May 2012, p. 27.
- <sup>1325</sup> A further consultation document was published in 2017 dealing with options for a simplified standardised approach. It will be considered in the context of that approach.
- <sup>1326</sup> BCBS, *Fundamental Review of the Trading Book*, October 2013, p. 7.
- <sup>1327</sup> *Ibid.* p. 8.
- <sup>1328</sup> *Ibid.*
- <sup>1329</sup> *Ibid.*, p. 8.
- <sup>1330</sup> *Ibid.*
- <sup>1331</sup> *Ibid.*, p. 10.
- <sup>1332</sup> *Ibid.*, p. 11.
- <sup>1333</sup> *Ibid.*
- <sup>1334</sup> *Ibid.*
- <sup>1335</sup> *Ibid.*
- <sup>1336</sup> *Ibid.*
- <sup>1337</sup> *Ibid.*, p. 13.
- <sup>1338</sup> *Ibid.*
- <sup>1339</sup> *Ibid.*, p. 14.
- <sup>1340</sup> The second consultative document set a one year maximum liquidity horizon. This was reduced to 120 days in the final standard.
- <sup>1341</sup> *Ibid.*
- <sup>1342</sup> *Ibid.*
- <sup>1343</sup> *Ibid.*
- <sup>1344</sup> Wiley, Chichester, 2005, p. 37.
- <sup>1345</sup> *Ibid.*, pp. 36-37.
- <sup>1346</sup> *Ibid.*, p. 37.
- <sup>1347</sup> *Ibid.*, p. 39.
- <sup>1348</sup> *Ibid.*, p. 40.
- <sup>1349</sup> *Ibid.*, p. 41.



- 1350 *Hands-On Value-at-Risk and Expected Shortfall*, Springer, Cham, 2018.
- 1351 *Ibid.*, p. 66.
- 1352 *Ibid.*, p. 67.
- 1353 Second consultation document, October 2013, p. 18.
- 1354 JC Hull, *Risk Management and Financial Institutions*, 5<sup>th</sup> ed., Wiley, Hoboken, 2018, p. 416 writes that “[f]or normal distributions, VaR with a 99% confidence level and ES with a 97.5% confidence are almost exactly the same. [...] For non-normal distributions they are not equivalent. When the loss distribution has a heavier tail than a normal distribution, the 97.5% ES can be considered greater than the 99% VaR”.
- 1355 For some European banks it may be the Eurozone crisis as banks in some crisis-hit countries suffered worse losses than in 2007-2008. An example might be Greece.
- 1356 *Ibid.*, p. 20.
- 1357 According to JC Hull, *Risk Management and Financial Institutions*, 5<sup>th</sup> ed., Wiley, Hoboken, 2018, p. 417 the fundamental review of the trading book “counteracts regulatory arbitrage by defining more clearly than previously the differences between the two books”.
- 1358 RBC 25.1.
- 1359 RBC 25.2.
- 1360 RBC 25.3.
- 1361 RBC 25.5.
- 1362 RBC 25.6.
- 1363 RBC 25.9 n. 3 sets out a non-exhaustive list of equities that may be excluded from market risk capital charges. Banks are asked to discuss such listed equities with their supervisor and must manage the positions on a desk that does not carry out proprietary trading.
- 1364 RBC 25.9.
- 1365 RBC 25.8.
- 1366 RBC 25.7.
- 1367 RBC 25.9 n. 4.
- 1368 RBC 25.10(1).
- 1369 RBC 25.10(2).
- 1370 RBC 25.11.
- 1371 RBC 25.12.
- 1372 RBC 25.14.
- 1373 RBC 25.15.
- 1374 RBC 25.19.
- 1375 RBC 25.21-25.27.
- 1376 RBC 25.28.
- 1377 RBC 25.30-25.34.
- 1378 MAR 10.1.
- 1379 MAR 30.1.
- 1380 MAR 30.14.
- 1381 MAR 30.2.
- 1382 MAR 30.4
- 1383 MAR 21.1.
- 1384 MAR 12.2.
- 1385 MAR 12.3.
- 1386 MAR 12.4(1).
- 1387 MAR 12.4(2).
- 1388 MAR 12.4(3).
- 1389 MAR 12.5.
- 1390 MAR 12.6.
- 1391 MAR 32.2.
- 1392 This is because large illiquid securitisation positions, often of sub-prime mortgages, were held in the trading book of banks during the financial crisis, and incurred very large losses.
- 1393 MAR 11.8(2).
- 1394 *Ibid.*
- 1395 MAR 30.6-MAR 30.11 and MAR 30.13.
- 1396 MAR 30.15.
- 1397 MAR 30.16.
- 1398 MAR 30.17.
- 1399 MAR 30.19.
- 1400 MAR 30.20.
- 1401 MAR 30.21.
- 1402 MAR 30.22.
- 1403 MAR 31.1.
- 1404 *Ibid.*
- 1405 MAR 31.2.
- 1406 MAR 31.3.
- 1407 MAR 31.6.
- 1408 MAR 31.9.
- 1409 MAR 31.11.
- 1410 MAR 31.8.
- 1411 MAR 31.10.
- 1412 MAR 31.12.
- 1413 MAR 31.13.
- 1414 MAR 31.14.

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- 1415 MAR 31.16.  
1416 MAR 31.17.  
1417 MAR 31.23.  
1418 MAR 31.26.  
1419 MAR 33.1.  
1420 MAR 33.2.  
1421 MAR 33.3.  
1422 MAR 33.4.  
1423 JC Hull, *Risk Management and Financial Institutions*, 5<sup>th</sup> ed., Wiley, Hoboken, 2018, p. 422.  
1424 *Ibid.*, pp. 421-422.  
1425 *Ibid.*, p. 423.  
1426 *Ibid.*, p. 426.  
1427 MAR 33.12.  
1428 MAR 33.8.  
1429 MAR 31.11.  
1430 MAR 33.9.  
1431 MAR 33.5.  
1432 MAR 33.6(1).  
1433 MAR 33.7.  
1434 *Ibid.*  
1435 MAR 33.14.  
1436 MAR 33.6(2).  
1437 MAR 33.6.  
1438 MAR 33.15.  
1439 MAR 33.41.  
1440 MAR 33.42.  
1441 MAR 33.16.  
1442 MAR 33.43.  
1443 *Ibid.* and MAR 33.45.  
1444 MAR 33.46.  
1445 MAR 10.28.  
1446 MAR 32.1.  
1447 MAR 32.3.  
1448 MAR 32.4.  
1449 MAR 10.31.  
1450 MAR 10.32.  
1451 MAR 32.5.  
1452 *Ibid.*  
1453 MAR 32.6.  
1454 MAR 32.8-32.9.  
1455 MAR 32.9.  
1456 MAR 32.14-32.15.  
1457 Market Risk Standard, January 2016, Appendix B.  
1458 *Ibid.*  
1459 MAR 32.16.  
1460 VaR models can be designed to place greater weight on more recent market data. For the backtesting requirement this is prohibited.  
1461 MAR 32.19.  
1462 Market Risk Standard, January 2016, Appendix B.  
1463 MAR 32.20.  
1464 MAR 10.29.  
1465 MAR 32.22. See also MAR 10.33.  
1466 MAR 10.32.  
1467 MAR 32.24.  
1468 January 2016, Appendix B.  
1469 Consultative Document, March 2018, p. 6.  
1470 *Ibid.*  
1471 *Ibid.*  
1472 MAR 32.34.  
1473 Consultative Document, March 2018, p. 7.  
1474 MAR 32.42.  
1475 MAR 32.44.  
1476 MAR 32.43.  
1477 MAR 33.18.  
1478 MAR 33.19.  
1479 MAR 33.20.  
1480 MAR 33.21.  
1481 *Ibid.*  
1482 MAR 33.36.  
1483 This raises the question of why the credit risk model would remain approved.  
1484 MAR 33.37.  
1485 MAR 33.38.  
1486 MAR 33.22.  
1487 MAR 33.24.

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- 1488 MAR 33.25.  
1489 MAR 33.26.  
1490 MAR 33.27.  
1491 MAR 33.29.  
1492 MAR 33.32.  
1493 MAR 33.30.  
1494 MAR 33.33.  
1495 MAR 33.40.  
1496 MAR 33.34.  
1497 May 2012, p. 41.  
1498 *Ibid.*  
1499 Consultative document, May 2012, p. 42.  
1500 Consultative document, October 2013, p. 32.  
1501 *Ibid.*  
1502 *Ibid.*  
1503 *Ibid.*  
1504 *Ibid.*  
1505 *Ibid.*  
1506 *Ibid.*  
1507 Consultative document, December 2014, pp. 6-7.  
1508 *Ibid.*, p. 7.  
1509 *Ibid.*  
1510 *Ibid.*  
1511 *Ibid.*, p. 8.  
1512 *Ibid.*  
1513 *Ibid.*  
1514 January 2016.  
1515 *Ibid.*, Executive Summary.  
1516 *Ibid.*  
1517 *Ibid.*  
1518 March 2018, p. 1.  
1519 *Ibid.*, p. 2.  
1520 *Ibid.*, pp 3-4.  
1521 *Ibid.*, p. 4.  
1522 *Ibid.*  
1523 *Explanatory Note*, January 2019, p. 9.  
1524 *Ibid.*, p.10.  
1525 *Ibid.*, pp 10-11.  
1526 MAR 11.8(1).  
1527 MAR 11.8(2).  
1528 MAR 11.9.  
1529 MAR 20.4.  
1530 *Ibid.*  
1531 MAR 20.4(d).  
1532 MAR 20.4(2).  
1533 MAR 20.4(3) and 23.2.  
1534 MAR 21.1.  
1535 MAR 21.1(2).  
1536 MAR 10.14.  
1537 MAR 10.15.  
1538 MAR 10.16.  
1539 MAR 21.1(3).  
1540 MAR 21.1(1).  
1541 MAR 21.1(4).  
1542 MAR 21.1(5).  
1543 MAR 20.5.  
1544 MAR 20.5 n. 1.  
1545 MAR 21.2.  
1546 MAR 23.3 n. 1.  
1547 MAR 21.2(1)-(3).  
1548 MAR 21.2(4).  
1549 MAR 21.4.  
1550 MAR 21.5.  
1551 MAR 21.6.  
1552 The reader is referred to the Basel III text for the modifications.  
1553 MAR 21.7.  
1554 Accordingly rates derived from LIBOR or other IBORs are prohibited.  
1555 MAR 21.8(1)-(3).  
1556 This presumably reflects the difference between European, Bermudan and American options.  
1557 MAR 21.8(4).  
1558 MAR 21.8(5).  
1559 MAR 21.9(1).  
1560 MAR 21.9(2).  
1561 MAR 21.9(3).

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- 1562 *Risk Management and Financial Institutions*, 5<sup>th</sup> ed., Wiley, Hoboken, 2018, pp. 419-420.
- 1563 *Ibid.*, p. 420.
- 1564 MAR 21.10(1).
- 1565 MAR 21.10(2).
- 1566 MAR 21.10(4).
- 1567 MAR 21.11(1).
- 1568 MAR 21.11(2).
- 1569 MAR 21.11(3).
- 1570 MAR 21.11(4).
- 1571 MAR 21.12(1).
- 1572 MAR 21.12(2).
- 1573 MAR 21.12(3).
- 1574 Recognising price may vary on place of delivery.
- 1575 MAR 21.13(1).
- 1576 MAR 21.13(2).
- 1577 MAR 21.13(3).
- 1578 MAR 21.14(1).
- 1579 MAR 21.14(2).
- 1580 MAR 21.14(3).
- 1581 MAR 21.14(4).
- 1582 Tax and exchange control regulations may result in a significant economic difference. This was seen recently in the difference between the on-shore and off-shore price of the Icelandic krona.
- 1583 MAR 21.16.
- 1584 MAR 21.19 - 21.24.
- 1585 MAR 21.25.
- 1586 MAR 21.26.
- 1587 MAR 21.31-21.34.
- 1588 MAR 21.35-21.36.
- 1589 MAR 21.37.
- 1590 MAR 21.39-21.101.
- 1591 MAR 22.1.
- 1592 MAR 22.2.
- 1593 MAR 22.3.
- 1594 MAR 22.4.
- 1595 MAR 22.9.
- 1596 MAR 22.10.
- 1597 MAR 22.11.
- 1598 MAR 22.12.
- 1599 MAR 22.14(1).
- 1600 MAR 22.15.
- 1601 MAR 22.18.
- 1602 MAR 22.19.
- 1603 MAR 22.22.
- 1604 MAR 22.23.
- 1605 MAR 22.25.
- 1606 MAR 22.27.
- 1607 MAR 22.27.
- 1608 MAR 22.34.
- 1609 MAR 22.35.
- 1610 MAR 22.36.
- 1611 MAR 22.37.
- 1612 MAR 22.38.
- 1613 MAR 22.39.
- 1614 MAR 22.40.
- 1615 MAR 22.41.
- 1616 MAR 22.42.
- 1617 MAR 22.44.
- 1618 MAR 22.45.
- 1619 MAR 23.1.
- 1620 *Explanatory note on the minimum capital requirements for market risk*, p. 10.
- 1621 MAR 23.2.
- 1622 MAR 23.3.
- 1623 MAR 23.3 n. 1.
- 1624 MAR 23.4.
- 1625 An Asian option is an option where the pay-off depends on the average price of the underlying instrument over a certain period of time. American and European options (they have significant differences) depend on the price of the underlying at a specific point in time and are not dependent on average prices.
- 1626 Digital options let the trader set manually a strike price with only two possible outcomes. If the trader sets the strike price at less than the market price the option is profitable. If not, the trader loses his investment.
- 1627 A basket option allows the holder to buy or sell the basket at a specific price, on or before a specific date.
- 1628 A spread option derives its value from the difference, or spread, between the prices of two or more assets.
- 1629 A Bermudan option allows the purchaser to exercise the option at pre-determined dates as well as the expiry date. As such, Bermudan options differ from European options (exercisable only on the maturity date) and

- American options (exercisable at any time prior to maturity). A Bermudan option is therefore usually cheaper than an American option, although more expensive than a European option.
- <sup>1630</sup> A quanto option is a cash-settled, cross-currency derivative in which the underlying asset has a payoff in one country, but the payoff is converted into another currency in which the option is settled.
- <sup>1631</sup> In countries with a tradition of fixed mortgage rates (e.g. the USA and France) when the current fixed interest rates exceeds the refinancing rate net of costs a mortgagor will rationally refinance for financial gain. It is unclear why a borrower on a mortgage would seek to refinance a mortgage at a loss for “social” reasons.
- <sup>1632</sup> MAR 23.5.
- <sup>1633</sup> This term is usually used in the context of futures and not options referencing multiple underlyings. The cheapest to deliver is a method used to deliver the least expensive future contract to a buyer. Logically, a cheapest-to-delivery option is an option on multiple underlyings where the seller has the choice to deliver (or pay the cash value, if cash settled) of a multiple number of underlyings when the option is exercised.
- <sup>1634</sup> Implied volatility rises when the underlying asset of an option rises if it is out-of-the-money or in-the-money. It only applies to some options.
- <sup>1635</sup> MAR 23.6.
- <sup>1636</sup> The words in brackets are not set out in the Basel III text but the RRAO is intended to supplement these capital requirements.
- <sup>1637</sup> MAR 23.8.
- <sup>1638</sup> MAR 23.8 n. 2.
- <sup>1639</sup> June 2017, p.1.
- <sup>1640</sup> March 2018, p. 13.
- <sup>1641</sup> MAR 11.7.
- <sup>1642</sup> MAR 11.7(2).
- <sup>1643</sup> *Explanatory note on the minimum capital requirements for market risk*, January 2019, p. 11. These scalars differ from earlier proposals.
- <sup>1644</sup> MAR 40.1.
- <sup>1645</sup> MAR 40.3.
- <sup>1646</sup> MAR 40.3 n. 1.
- <sup>1647</sup> MAR 40.6.
- <sup>1648</sup> MAR 40.8.
- <sup>1649</sup> MAR 40.9.
- <sup>1650</sup> MAR 40.12.
- <sup>1651</sup> MAR 40.14.
- <sup>1652</sup> MAR 40.15.
- <sup>1653</sup> MAR 40.16-40.19.
- <sup>1654</sup> MAR 40.21.
- <sup>1655</sup> MAR 40.22.
- <sup>1656</sup> MAR 40.23.
- <sup>1657</sup> *Ibid.*
- <sup>1658</sup> *Ibid.*
- <sup>1659</sup> MAR 40.24.
- <sup>1660</sup> MAR 40.25.
- <sup>1661</sup> MAR 40.26.
- <sup>1662</sup> MAR 40.27.
- <sup>1663</sup> MAR 40.28.
- <sup>1664</sup> *Ibid.*
- <sup>1665</sup> *Ibid.*
- <sup>1666</sup> *Ibid.*
- <sup>1667</sup> MAR 40.28(2).
- <sup>1668</sup> MAR 40.29.
- <sup>1669</sup> MAR 40.29(5).
- <sup>1670</sup> MAR 40.32.
- <sup>1671</sup> *Ibid.*
- <sup>1672</sup> MAR 40.33.
- <sup>1673</sup> MAR 40.34.
- <sup>1674</sup> *Ibid.*
- <sup>1675</sup> MAR 40.35.
- <sup>1676</sup> MAR 40.36.
- <sup>1677</sup> MAR 40.37.
- <sup>1678</sup> MAR 40.38. The example of LIBOR seems out of date.
- <sup>1679</sup> MAR 40.40.
- <sup>1680</sup> Basel III refers only to LIBOR but the corresponding RFR must apply once LIBOR is discontinued.
- <sup>1681</sup> Gamma risk for an option is the rate of change of an option’s delta per one point move in the underlying asset’s price. It measures the convexity of the derivative’s value.
- <sup>1682</sup> MAR 40.40 n. 2.
- <sup>1683</sup> MAR 40.41.
- <sup>1684</sup> *Ibid.*
- <sup>1685</sup> MAR 40.42.
- <sup>1686</sup> MAR 40.43.
- <sup>1687</sup> MAR 40.44.
- <sup>1688</sup> MAR 40.45.
- <sup>1689</sup> *Ibid.*
- <sup>1690</sup> MAR 40.46.
- <sup>1691</sup> MAR 40.47.

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- 1692 MAR 40.48-40.49.  
1693 MAR 40.52.  
1694 MAR 40.53. The reason for this treatment may be a legacy of the gold standard and the Bretton Woods system of fixed but adjustable exchange rates whereby all other currencies were tied to the US dollar, and the US dollar to gold. The Bretton Woods system collapsed after 1971 with President Nixon's removal of the convertibility of the US dollar into gold.  
1695 MAR 40.54.  
1696 MAR 40.55.  
1697 MAR 40.59.  
1698 MAR 40.60.  
1699 *Ibid.*  
1700 MAR 40.61.  
1701 MAR 40.63.  
1702 *Ibid.*  
1703 MAR 40.64.  
1704 MAR 40.65(2).  
1705 MAR 40.65(3).  
1706 MAR 40.66.  
1707 MAR 40.67.  
1708 *Ibid.*  
1709 MAR 40.68.  
1710 MAR 40.69.  
1711 *Ibid.*  
1712 MAR 40.70.  
1713 MAR 40.71.  
1714 MAR 40.72.  
1715 MAR 40.73.  
1716 MAR 40.72(2).  
1717 MAR 40.76.  
1718 MAR 40.76.  
1719 MAR 40.75.  
1720 MAR 40.77.  
1721 *Ibid.*  
1722 MAR 40.78.  
1723 MAR 40.80.  
1724 *Ibid.*  
1725 *Ibid.*  
1726 MAR 40.81.  
1727 *Ibid.*  
1728 MAR 40.82.  
1729 MAR 40.83.  
1730 MAR 40.84.  
1731 *Ibid.*  
1732 MAR 40.86.  
1733 *Final Basel III Modelling*, Palgrave Macmillan, Cham, 2018.  
1734 *Ibid.*, p. 183.  
1735 July 2015.  
1736 *Ibid.*, p. 1.  
1737 *Ibid.*  
1738 *Ibid.*  
1739 *Ibid.*  
1740 MAR 50.7.  
1741 MAR 50.7. n. 1 states that this is in contrast to the standardised approach to market risk which is applicable regardless of supervisory consent.  
1742 MAR 50.3.  
1743 MAR 50.2.  
1744 MAR 50.1.  
1745 MAR 50.5.  
1746 MAR 50.6.  
1747 MAR 50.9.  
1748 *Ibid.*  
1749 MAR 50.11.  
1750 *Ibid.*  
1751 MAR 50.12.  
1752 MAR 50.13.  
1753 *Ibid.*  
1754 *Final Basel III Modelling*, Palgrave Macmillan, Cham, 2018, p. 248.  
1755 MAR 50.14.  
1756 MAR 50.15.  
1757 MAR 50.16.  
1758 MAR 50.17.  
1759 MAR 50.18.  
1760 MAR 50.19.  
1761 MAR 50.20.

- 1762 MAR 50.21.  
1763 MAR 50.22.  
1764 MAR 50.27.  
1765 *Final Basel III Modelling*, Palgrave Macmillan, Cham, 2018, p. 248.  
1766 *Ibid.*, pp. 230-231.  
1767 MAR 50.28.  
1768 MAR 50.29.  
1769 MAR 50.31.  
1770 I.e. in a random manner.  
1771 MAR 50.32.  
1772 MAR 50.36.  
1773 MAR 50.37.  
1774 MAR 50.38.  
1775 MAR 50.39.  
1776 MAR 50.42.  
1777 MAR 50.41.  
1778 MAR 50.43.  
1779 MAR 50.45.  
1780 MAR 50.48.  
1781 *Ibid.*  
1782 MAR 50.47.  
1783 MAR 50.53(1)-(2).  
1784 MAR 50.54-50.77.  
1785 In M Neisen and S Röth, *Basel IV*, 2<sup>nd</sup> ed., Wiley, Weinheim, 2018, p. 298.  
1786 OPE 10.1.  
1787 OPE 10.1 n. 1.  
1788 OPE 25.1.  
1789 OPE 25.2.  
1790 *Ibid.*  
1791 This obviously includes shares.  
1792 As the Basel framework applies on a consolidated basis all dividends from subsidiaries within the consolidated group are merely internal allocations of profits within the group, making it nonsensical to include them. Such businesses have their own bespoke capital adequacy regime.  
1793  
1794 OPE 10.3.  
1795 OPE 10.4.  
1796 OPE 10.5-10.6.  
1797 OPE 25.4.  
1798 For how to calculate the average over three years see OPE 25.5 and OPE 25.5 n. 1.  
1799 OPE 25.7.  
1800 OPE 25.7 n. 2.  
1801 OPE 25.11.  
1802 As  $ORC = BIC \times ILM$  then by definition  $ORC = BIC$ .  
1803 OPE 25.11.  
1804 OPE 25.8.  
1805 OPE 25.9.  
1806 OPE 25.15.  
1807 OPE 25.10.  
1808 OPE 25.12.  
1809 OPE 25.13.  
1810 OPE 25.16.  
1811 OPE 25.17.  
1812 OPE 25.18.  
1813 OPE 25.20.  
1814 See OPE 25.21.  
1815 OPE 25.25.  
1816 OPE 25.26.  
1817 OPE 25.27.  
1818 OPE 25.28.  
1819 OPE 25.34.  
1820 OPE 25.30.  
1821 OPE 25.32.  
1822 OPE 25.35.  
1823 LEV 20.1.  
1824 LEV 20.2.  
1825 LEV 20.3.  
1826 LEV 20.4.  
1827 LEV 20.5.  
1828 LEV 20.7.  
1829 LEV 20.6.  
1830 LEV 20.7.  
1831 LEV 10.1.  
1832 LEV 10.2.  
1833 LEV 10.1 n. 1 and LEV 30.3(1).  
1834 LEV 10.2.

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- 1835 LEV 30.3(2).  
1836 LEV 30.3(3).  
1837 LEV 30.1.  
1838 LEV 30.4.  
1839 LEV 30.2.  
1840 LEV 30.5. The reason for this treatment of synthetic securitisations is due to the leverage ratio disregarding in most cases credit risk mitigation.  
1841 LEV 30.6.  
1842 LEV 30.7.  
1843 LEV 30.8.  
1844 LEV 30.8 n. 1.  
1845 LEV 30.8. FAQ 1.  
1846 LEV 30.9.  
1847 *Ibid.*, n. 2.  
1848 LEV 30.10.  
1849 LEV 30.11.  
1850 LEV 30.45.  
1851 LEV 30.49.  
1852 LEV 30.50.  
1853 LEV 30.51.  
1854 LEV 30.52.  
1855 LEV 30.47 n. 26.  
1856 LEV 30.53.  
1857 LEV 30.54.  
1858 LEV 30.55.  
1859 LEV 30.56.  
1860 LEV 30.13.  
1861 LEV 30.14.  
1862 LEV 30.16(2).  
1863 LEV 30.16(3).  
1864 LEV 30.17.  
1865 LEV 30.18.  
1866 LEV 30.19.  
1867 LEV 30.20.  
1868 LEV 30.21.  
1869 LEV 30.22.  
1870 LEV 30.23.  
1871 LEV 30.24.  
1872 LEV 30.25.  
1873 LEV 30.26.  
1874 LEV 30.28.  
1875 LEV 30.29.  
1876 LEV 30.30.  
1877 LEV 30.31.  
1878 LEV 30.32.  
1879 LEV 30.35.  
1880 LEV 30.33.  
1881 LEV 30.34.  
1882 LEV 30.36 n. 17.  
1883 LEV 30.37. The actual rules are more complex than as summarised.  
1884 LEV 30.38.  
1885 LEV 30.39.  
1886 LEV 30.40.  
1887 LEV 30.44.  
1888 LEV 30.41.  
1889 LEV 30.42 n. 24.  
1890 LEV 40.2.  
1891 LEV 40.3.  
1892 LEV 40.4.  
1893 LEX 10.1-10.2.  
1894 LEX 10.2 n. 1.  
1895 LEX 10.3.  
1896 LEX 10.4.  
1897 LEX 10.5.  
1898 LEX 10.8.  
1899 LEX 10.9.  
1900 LEX 10.10.  
1901 LEX 10.9.  
1902 LEX 10.12.  
1903 LEX 10.13.  
1904 LEX 10.15.  
1905 LEX 10.14.  
1906 LEX 10.16.  
1907 LEX 10.17.



- 1908 LEX 10.18.
- 1909 LEX 20.1.
- 1910 LEX 20.3.
- 1911 LEX 40.1.
- 1912 LEX 40.2.
- 1913 LEX 20.4.
- 1914 LEX 30.1.
- 1915 LEX 30.2 and LEX 30.2 n. 1.
- 1916 LEX 30.3 and LEX 30.3 n. 2.
- 1917 LEX 30.3.
- 1918 LEX 30.4.
- 1919 LEX 30.5.
- 1920 LEX 30.6.
- 1921 LEX 30.6 and LEX 30.12.
- 1922 LEX 30.8.
- 1923 LEX 30.9.
- 1924 LEX 0.10.
- 1925 LEX 30.11.
- 1926 LEX 30.13.
- 1927 LEX 30.14.
- 1928 *Ibid.*
- 1929 LEX 30.15.
- 1930 LEX 30.16.
- 1931 LEX 30.17.
- 1932 LEX 30.18.
- 1933 LEX 30.19.
- 1934 LEX 30.20.
- 1935 LEX 30.21.
- 1936 LEX 30.22.
- 1937 LEX 30.23.
- 1938 LEX30.24.
- 1939 LEX30.27. If the credit protection is a credit default swap (CDS) and the CDS provider or the reference obligation is not a financial institution then the amount assigned to the counterparty exposure is not the risk reduction in the exposure but the counterparty credit risk calculated under the standardised approach to counterparty credit risk: LEX 30.28.
- 1940 LEX 30.26.
- 1941 LEX 30.29.
- 1942 LEX 30.30.
- 1943 Bank of Cyprus. See Reuters *Insight: Why Did Cypriot Banks Keep Buying Greek Bonds?*, April 30 2013. The bank was recapitalised by a reduction of 47.5% of uninsured deposits which generated considerable controversy.
- 1944 LEX 30.31.
- 1945 LEX 30.32.
- 1946 LEX 30.33.
- 1947 LEX 30.35.
- 1948 LEX 30.36.
- 1949 LEX 30.37.
- 1950 LEX 30.38.
- 1951 This refers to prudential regulation. Conduct of business rules, such as consumer credit or consumer protection law may apply.
- 1952 LEX 30.39(2).
- 1953 It does not seem to require that any of these entities attract a 0% risk weight.
- 1954 LEX 30.40.
- 1955 LEX 30.39(3).
- 1956 LEX 30.42.
- 1957 LEX 30.42 n. 11.
- 1958 LEX 30.46.
- 1959 LEX 30.43.
- 1960 LEX 30.44.
- 1961 LEX 30.48.
- 1962 LEX 30.49.
- 1963 LEX 30.50.
- 1964 LEX 30.51.
- 1965 LEX 30.54 n. 12. This is stated to be the same definition as that applies under the risk-based capital framework.
- 1966 LEX 30.54.
- 1967 LEX 30.55.
- 1968 LEX 30.56.
- 1969 LEX 30.56 FAQ 1.
- 1970 LEX 30.57.
- 1971 LEX 30.59.
- 1972 The possible exception was Long Term Capital Management which received a private sector Federal Reserve inspired bail-out in 1998.
- 1973 LCR 20.1.
- 1974 LCR 20.2.
- 1975 LCR 20.3.

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- 1976 LCR 20.4.  
1977 LCR 20.5.  
1978 LCR 20.6.  
1979 LCR 20.6.  
1980 LCR 20.7.  
1981 LCR 20.8.  
1982 LCR 10.9.  
1983 LCR 10.1.  
1984 LCR 10.2.  
1985 LCR 10.3.  
1986 LCR 10.5.  
1987 LCR 10.6.  
1988 LCR 10.7.  
1989 LCR 30.1.  
1990 *ibid.*  
1991 LCR 30.2.  
1992 *ibid.*  
1993 LCR 30.4 n. 2.  
1994 LCR 30.6-30.9.  
1995 LCR 30.10-30.12.  
1996 LCR 30.14.  
1997 LCR 30.15  
1998 LCR 30.16.  
1999 LCR 30.17.  
2000 LCR 30.18.  
2001 LCR 30.22.  
2002 LCR 30.23.  
2003 LCR 30.24.  
2004 LCR 30.25.  
2005 LCR 30.30.  
2006 LCR 30.31.  
2007 LCR 30.33.  
2008 LCR 30.34.  
2009 LCR 30.35.  
2010 LCR 30.36.  
2011 LCR 30.37.  
2012 *ibid.*  
2013 *ibid.*  
2014 LCR 30.38.  
2015 LCR 30.39.  
2016 LCR 30.40.  
2017 LCR 30.41.  
2018 LCR 30.43.  
2019 LCR 30.45.  
2020 LCR 30.46  
2021 LCR 30.47.  
2022 LCR 31.1.  
2023 LCR 31.1 n. 1.  
2024 LCR 31.3.  
2025 LCR 31.4.  
2026 LCR 31.6.  
2027 LCR 31.7.  
2028 LCR 31.8.  
2029 LCR 31.10  
2030 LCR 31.12.  
2031 LCR 31.13.  
2032 LCR 31.14.  
2033 LCR 31.14 n. 5.  
2034 LCR 31.15.  
2035 LCR 31.16.  
2036 LCR 31.17.  
2037 LCR 31.18.  
2038 LCR 31.19.  
2039 LCR 31.20(1).  
2040 LCR 31.20(2).  
2041 LCR 31.20(3).  
2042 LCR 40.1.  
2043 *ibid.*  
2044 LCR 40.5.  
2045 LCR 40.5 FAQ 1.  
2046 LCR 40.6.  
2047 LCR 40.7.  
2048 LCR 40.7 n. 2.  
2049 LCR 40.8.

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- 2050 LCR 40.9.  
2051 LCR 40.7.  
2052 LCR 40.11 and LCR 40.11 n. 5.  
2053 LCR 40.13.  
2054 LCR 40.13.  
2055 LCR 40.15.  
2056 LCR 40.16. Supervisors may impose a higher run-off to such deposits if they state the treatment and apply it to all banks in their jurisdiction: LCR 40.18. Where a bank allows depositors to break a term deposit of more than 30 days without cost the deposit must be treated as repayable on demand and allocated to the stable or less stable category: LCR 40.17. Supervisors may outline exceptional circumstances where this treatment does not apply such as financial hardship: *Ibid.*  
2057 LCR 40.19.  
2058 LCR 40.20.  
2059 LCR 40.23.  
2060 CRE 30.20(3).  
2061 LCR 40.23.  
2062 The use of the term is clearly deliberate: "[t]his means that the bank treats such deposits in its internal risk management systems consistently over time and in the same manner as other retail deposits, and that the deposits are not individually managed in a way comparable to larger corporate deposits": LCR 40.24.  
2063 LCR 40.23 n. 9.  
2064 LCR 40.22.  
2065 CR 40.40.  
2066 LCR 40.41.  
2067 LCR 40.32.  
2068 LCR 40.26.  
2069 LCR 40.27.  
2070 LCR 40.28.  
2071 LCR 40.29.  
2072 LCR 40.33-40.36.  
2073 LCR 40.40-40.41.  
2074 LCR 40.37.  
2075 LCR 40.43.  
2076 LCR 40.45.  
2077 LCR 40.46.  
2078 LCR 40.47.  
2079 LCR 40.48.  
2080 *Ibid.*  
2081 LCR 40.51 FAQ 2.  
2082 Such option can be exercised on any date up until the expiry date.  
2083 LCR 40.49.  
2084 LCR 40.50.  
2085 LCR 40.51.  
2086 LCR 40.52.  
2087 LCR 40.52 FAQ 3.  
2088 LCR 40.51 FAQ 1.  
2089 LCR 40.53.  
2090 LCR 40.55.  
2091 LCR 40.56.  
2092 LCR 40.56 FAQ 1.  
2093 LCR 40.57.  
2094 LCR 40.58. Under accounting standards in most developed jurisdictions the entities referred to would usually be consolidated.  
2095 LCR 40.59.  
2096 LCR 40.60.  
2097 LCR 40.61.  
2098 LCR 40.64.  
2099 LCR 40.65.  
2100 LCR 40.74.  
2101 LCR 40.66.  
2102 LCR 40.74 FAQ 1.  
2103 LCR 40.67.  
2104 LCR 40.68.  
2105 LCR 40.71. Lending commitments are excluded: LCR 40.72.  
2106 LCR 40.73.  
2107 LCR 40.77.  
2108 LCR 40.75.  
2109 LCR 40.78.  
2110 LCR 40.79.  
2111 *Ibid.*  
2112 LCR 40.80.  
2113 LCR 40.82.  
2114 LCR 40.83.  
2115 LCR 40.85.  
2116 LCR 40.86.

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- 2117 LCR 40.87.  
2118 LCR 40.88.  
2119 LCR 40.89.  
2120 LCR 40.91.  
2121 LCR 40.92.  
2122 LCR 40.93.  
2123 LCR 90.2.  
2124 NSF 20.1.  
2125 NSF 20.2.  
2126 *Ibid.*  
2127 NSF 20.3.  
2128 NSF 10.2.  
2129 NSF 10.1.  
2130 NSF 10.4.  
2131 NSF 10.5.  
2132 NSF 10.6.  
2133 NSF 30.1.  
2134 NSF 30.2.  
2135 NSF 30.3.  
2136 NSF 30.6.  
2137 NSF 30.7.  
2138 *Ibid.*  
2139 NSF 30.8. The requirements are set out in CRE 52.7 which is part of the standardised approach to counterparty credit risk, and discussed in that context.  
2140 NSF 30.9.  
2141 NSF 30.9 n. 2.  
2142 *Ibid.*  
2143 NSF 30.10.  
2144 NSF 30.10 FAQ 1.  
2145 NSF 30.11.  
2146 NSF 30.12.  
2147 NSF 30.12 n. 5.  
2148 NSF 99.1.  
2149 NSF 30.12 n. 5.  
2150 NSF 30.13.  
2151 NSF 30.13 n. 6.  
2152 NSF 30.14 n. 7.  
2153 NSF 30.14.  
2154 NSF 30.15.  
2155 NSF 30.15 n. 9.  
2156 NSF 30.16.  
2157 NSF 30.17.  
2158 *Ibid.*  
2159 *Ibid.*  
2160 NSF 30.18.  
2161 NSF 30.19.  
2162 NSF 30.20.  
2163 *Ibid.*  
2164 NSF 20.20 n. 11.  
2165 LCR 30.16.  
2166 NSF 30.20 n. 11.  
2167 NSF 30.20 FAQ 1.  
2168 *Ibid.*  
2169 NSF 30.20 FAQ 2.  
2170 NSF 30.20 FAQ 3.  
2171 *Ibid.*  
2172 *Ibid.*  
2173 An economic and not legal analysis seems required.  
2174 NSF 30.21.  
2175 NSF 30.21 FAQ 1.  
2176 NSF 30.21 FAQ 2.  
2177 NSF 30.21 FAQ 3.  
2178 NSF 30.22.  
2179 NSF 30.23.  
2180 NSF 30.24.  
2181 NSF 30.24 FAQ 1.  
2182 NSF 30.24 FAQ 2.  
2183 NSF 30.24 FAQ 3.  
2184 NSF 30.25 FAQ 1.  
2185 NSF 99.4.  
2186 NSF 30.25.  
2187 NSF 30.26.  
2188 NSF 30.26 FAQ 1.  
2189 NSF 30.27. Here there is an express reference to LCR 30.41.

- 2190 NSF 30.28. The Level 2 assets are defined by reference to LCR 30.43.
- 2191 NSF 30.29.
- 2192 NSF 30.29 FAQ 1.
- 2193 NSF 30.30.
- 2194 NSF 30.31.
- 2195 NSF 30.32 and NSF 30.32 FAQ 1.
- 2196 NSF 30.33.
- 2197 NSF 30.34.
- 2198 *Ibid.*
- 2199 NSF 30.35.
- 2200 *Ibid.*
- 2201 NSF 30.35 FAQ 1.
- 2202 NSF 99.
- 2203 MGN 20.1
- 2204 MGN 20.2.
- 2205 MGN 10.2.
- 2206 MGN 10.3 n. 3.
- 2207 MGN 10.3.
- 2208 MGN 10.4. The Basel III text refers only to initial margin but variation margin must surely also be provided and is current market practice.
- 2209 MGN 10.6. The multilateral development banks eligible for this treatment are those eligible for a 0% risk weighting under the standardised approach to credit risk: MGN 10.6 n. 6.
- 2210 MGN 10.6. n. 5.
- 2211 MGN 10.7.
- 2212 In some jurisdictions particular entities may be subject to sectoral conduct of business regulation e.g. utility companies, but these are generally not prudential in nature.
- 2213 MGN 20.3.
- 2214 MGN 20.4.
- 2215 MGN 10.8.
- 2216 MGN 10.10.
- 2217 MGN 10.11.
- 2218 MGN 10.12.
- 2219 MGN 20.6.
- 2220 MGN 10.13.
- 2221 MGN 10.15.
- 2222 MGN 10.14.
- 2223 MGN 10.16.
- 2224 MGN 20.8.
- 2225 MGN 20.9.
- 2226 MGN 20.9.
- 2227 MGN 20.11.
- 2228 MGN 20.13(1).
- 2229 MGN 20.13(2).
- 2230 MGN 20.14.
- 2231 MGN 20.15 and MGN 20.15 n. 6.
- 2232 *Ibid.*
- 2233 MGN 20.24.
- 2234 MGN 20.29.
- 2235 MGN 20.32.
- 2236 MGN 20.29.
- 2237 MGN 20.30.
- 2238 MGN 20.31.
- 2239 MGN 20.33 states “[i]n addition to the points regarding the use of internal models discussed in the context of initial margin” and goes on to discuss eligible collateral in the passage quoted immediately below. Such “points” may incorporate all of the specific requirements (including the 99% one tailed confidence level based on a 10 day period) for initial margin, or only some at national discretion.
- 2240 MGN 20.33.
- 2241 MGN 20.26.
- 2242 MGN 20.27.
- 2243 MGN 20.28.
- 2244 MGN 20.17.
- 2245 MGN 20.16.
- 2246 MGN 20.17.
- 2247 MGN 20.17 n. 7.
- 2248 MGN 20.19.
- 2249 MGN 20.20.
- 2250 MGN 20.22.
- 2251 MGN 20.23.
- 2252 MGN 20.24.
- 2253 MGN 20.34.
- 2254 *Ibid.*
- 2255 MGN 20.35.
- 2256 MGN 20.37.
- 2257 MGN 20.38.

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- <sup>2258</sup> MGN 20.41.
- <sup>2259</sup> This would not be the case if the property were held in trust, but this would defeat the objective of re-hypothecation.
- <sup>2260</sup> MGN 20.42.
- <sup>2261</sup> MGN 20.43.
- <sup>2262</sup> MGN 20.44.
- <sup>2263</sup> [Computers and money: the work of the Basel Committee on cryptoassets \(bis.org\)](#).
- <sup>2264</sup> [Designing a prudential treatment for crypto-assets \(bis.org\)](#).
- <sup>2265</sup> [Prudential treatment of cryptoasset exposures \(bis.org\)](#).
- <sup>2266</sup> [BCBS533, Second consultation on the prudential treatment of cryptoasset exposures](#).
- <sup>2267</sup> Moody's, [Data on G20 financial institutions reveals high exposure to carbon transition risk infographic](#), 23 September (2021).
- <sup>2268</sup> [Press release: Basel Committee publishes analytical reports on climate-related financial risks \(bis.org\)](#).
- <sup>2269</sup> [Principles for the effective management and supervision of climate-related financial risks \(bis.org\)](#).