Discussion Paper

10/4

Financial Services Authority

The prudential regime for trading activities

A fundamental review

Financial Services Authority

August 2010

Contents

The Financial Services Authority (FSA) invites comments on this Discussion Paper (DP). Comments should be submitted by **26 November 2010**. This DP contains a number of questions for respondents, which can be submitted using an electronic response form. The FSA would prefer you to use this electronic form when sending your responses. Comments should be sent by electronic submission using the form on the FSA's website at (www.fsa.gov.uk/Pages/Library/Policy/DP/2010/dp10_04_response.shtml).

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List of acronyms used in this paper

A list of acronyms used in this paper is set out below:

ABS	Asset Backed Security
AFS	Available for Sale
BCBS	Basel Committee on Banking Supervision
BIPRU	Prudential sourcebook for Banks, Building Societies and Investment Firms
BIS	Bank for International Settlements
CAD	Capital Adequacy Directive
CCP	Central Counterparty
CCR	Counterparty Credit Risk
CDS	Credit Default Swap
CEBS	Committee of European Banking Supervisors
CDO	Collateralised Debt Obligation
CDPC	Credit Derivative Product Company
CGFS	Committee on the Global Financial System
CMS	Constant Maturity Swaps
CP	Consultation Paper
CPPI	Constant Proportion Portfolio Insurance
CRM	Comprehensive Risk Measure
CVA	Credit Valuation Adjustment
DP	Discussion Paper
EAD	Exposure at Default
EU	European Union
FASB	Financial Accounting Standards Board
FRO	Financial Risk Outlook
FSA	Financial Services Authority
FSB	Financial Stability Board

FSF	Financial Stability Forum
FVO	Fair Value Option
FX	Foreign Exchange
GAAP	Generally Accepted Accounting Principles
HFT	High Frequency Trading
HfT	Held for Trading
IAS	International Accounting Standard
IASB	International Accounting Standards Board
IDRC	Incremental Default Risk Charge
IFRS	International Financial Reporting Standard
IIF	Institute of International Finance
IMF	International Monetary Fund
IRC	Incremental Risk Charge
IPV	Independent Price Verification
IRB	Internal Ratings Based
IRRBB	Interest Rate Risk in the Banking Book
IT	Information Technology
LCFI	Large Complex Financial Institution
LGD	Loss Given Default
MiFID	Markets in Financial Instruments Directive
MTF	Multilateral Trading Facility
MtM	Mark to Market
ONS	Office for National Statistics
OTC	Over the Counter
P&L	Profit and Loss
PD	Probability of Default
PRDC	Power Reverse Dual Currency
RMBS	Residential Mortgage Backed Security
RNIV	Risks Not in VaR
SEC	Securities and Exchange Commission
SFT	Securities Financing Transaction
SIV	Structured Investment Vehicle
UK	United Kingdom
US	United States
VaR	Value at Risk

1 Overview

Introduction and purpose

1.1 In July 2009, the Basel Committee on Banking Supervision (BCBS) agreed a range of amendments to the Basel II market risk framework,[1] targeting specific weaknesses highlighted by the financial crisis. On average, these changes will increase the capital held against trading activities in large banks to more than three times current levels. Trading activities have grown enormously in recent years, and the financial crisis was in part triggered by losses crystallised in the trading books of large banks. It is therefore necessary to build on the changes already in progress with a re-appraisal of the prudential approach to trading activities, dealing with the arbitrages and mis-specifications of risk that continue to exist and complementing the many other areas of financial reform currently under consideration.

1.2 We expressed this view in *The Turner Review* where we called for a 'Fundamental Review' of the prudential regime for trading activities. This Discussion Paper (DP) follows up *The Turner Review* with a detailed discussion of the issues that we think should form part of the Fundamental Review which is now being developed internationally by the BCBS.

1.3 The recently formed Independent Commission on Banking will be addressing questions on whether the trading activities of banks should be separated from other activities. We do not comment on those questions here and the recommendations made in this DP will be relevant whether or not trading activities are undertaken directly by banking entities or by other firms within regulated groups.

1.4 Many trading activities play an important role in the effective intermediation of risk between real economy participants. We could increase the safety of the system by imposing prohibitively high standards on these activities within regulated firms, but this would either significantly increase costs to the economy, or drive these activities outside the regulated sector. However, where trading activities do not aid efficiency in the economy, but simply pass risks around the regulated sector or allow economic

1 Revisions to the Basel II market risk framework – final version www.bis.org/publ/bcbs158.htm

rent extraction by investment banking operations, then imposing deliberately conservative standards may still make the system safer without imposing the same costs on the wider economy.

1.5 The purpose of this DP is to stimulate debate, and the feedback we receive will feed in to the international discussions at the BCBS through the FSA's involvement in that forum.

Key recommendations

1.6 We have drawn on a number of data sources including our own internal research and data from the crisis period; externally produced reports; and our discussions with firms, industry groups and other regulators. Some of these ideas were discussed at a roundtable which we hosted in March 2010 with representatives from academia, regulation, and the financial industry. We recommend a range of actions across three key areas (a complete list of recommendations made in the DP is contained in Annex 6):

I. Valuation

We recommend an increased focus on valuing traded positions as an input into capital resources. The range of values reported between firms for similar positions has often been greater than the levels of capital held against market risks, meaning that greater effort should be spent ensuring that valuation practices are robust and consistent. We also see the need for a specific assessment of valuation uncertainty, reducing the ability of firms to add leverage on the basis of uncertain values that can lead to pro-cyclicality.

II. Coverage, coherence and the capital framework

We recommend changing the structure of the capital framework to bring greater coherence and reduce opportunities for structural arbitrage within the banking sector and the wider financial system. During the crisis it became clear that a number of risks that firms were exposed to were not captured in the capital framework, and the assumption of resiliently liquid traded markets was severely tested. We recommend changes to the capital framework to address both of these issues.

III. Risk management and modelling

Finally, we recommend specific measures aimed at improving firms' risk management and modelling standards, and ensuring that these are aligned with regulatory objectives. The crisis revealed serious shortcomings in practices across firms. In some cases, firms simply did not manage traded risks effectively, while in others the shortcomings arose because the measures used by firms were designed to focus on narrow, firm specific events without due consideration of system-wide events that regulators care about.

1.7 The recommendations we make are focused on structural deficiencies of the current regime. At this stage it is not clear whether the capital requirements need to change, or whether we will focus on re-allocating capital requirements to better target the riskiest elements of trading activities. In either case, the outcome of the fundamental review will be subject to consultation and impact assessments to determine whether any recalibration of the regime might be necessary.

1.8 In making these recommendations, we have been mindful that regulatory capital requirements should balance the desire to be risk sensitive, which often leads to complexity, with the need for simplicity and transparency. During the crisis, investors lost confidence that firms had a sufficient quantity and quality of capital to survive severe economic stress. This was not helped by the complexity and opacity of regulatory capital measures for the trading book.

1.9 Also underlying these recommendations is a reappraisal of the reliance on market-implied measures of risk. Before the current crisis, many markets were trading at levels that suggested they had entered a new paradigm where risk was structurally lower. This proved illusory as it became clear that the market had been systematically under-pricing risk. Trading book capital requirements currently place a heavy reliance on market-implied measures of risk, and we consider ways to prevent banks being undercapitalised due to market inefficiencies.

1.10 Finally, there is an inherent conflict between delivering internationally agreed regulatory standards and the need to respond quickly to market developments that lead to erosion and/or arbitrage of capital standards over time. Firms have an important part to play in achieving this. We require, in 'Principle 11' of our Principles for Business handbook, that firms disclose to us anything relating to their activities for which we would reasonably expect notice. We expect firms to be ready to engage in an early and active dialogue with us relating to new product development, and innovation in product structures. Only in this way can we ensure that our regulations remain robust whilst adapting to accommodate genuinely beneficial innovation.

The structure of this DP

1.11 This DP is organised into nine chapters, including this overview:

- Chapter 2 puts this DP in context. There are currently a wide range of major international reforms to the regulatory framework underway, and we consider how this review fits in with other ongoing work-streams.
- Chapter 3 describes the current UK prudential regime for trading activities as it applies to banks, building societies and investment firms (BIPRU firms).[2] This allows us to illustrate specific structural deficiencies in the make-up of the current framework that may have contributed to the recent financial crisis.
- Chapter 4 describes the evolution of traded markets over the past 20 years, and presents evidence of structural differences between credit and other traded markets.

2 BIPRU: Prudential sourcebook for Banks, Building Societies and Investment Firms.

- Chapter 5 provides a detailed analysis of what the evidence from the crisis tells us about designing a new framework. This chapter gives a detailed account of the results of our 'loss attribution' exercise undertaken in late 2009, which analysed the sources of $240bn of investment banking losses across 10 firms during a large part of the crisis. Its findings highlight losses both in complex structured finance products and in much simpler areas, such as government bonds, demonstrating widespread risk management failures in the lead-up to and during the crisis. The size of these losses highlights the importance of the recommendations made in the DP.
- Chapter 6 begins the discussion of what changes need to be implemented. This chapter focuses on the importance of valuation as an input into the framework.
- Chapter 7 considers measures to address issues with the coverage and coherence of the current regulatory capital requirements for trading activities.
- Chapter 8 discusses how the regulatory regime can better address problems that arose through firms' risk management and modelling practices.
- Chapter 9 draws together the recommendations from chapters 6 to 8 and considers how these might be delivered in practice, highlighting key questions that will inform the final policy choices.

Who should read this DP

1.12 This DP focuses on the prudential requirements for banks and investment firms that engage in trading activities. However, many elements could be applied more broadly and will be of general interest in the financial services industry, including policy makers and supervisors in other countries. There are implications for the global regulatory framework and global banking system, which will have clear implications for consumers.

Next steps

1.13 The discussion period ends on 26 November 2010. During this period we plan a series of meetings to discuss the contents of this document with industry groups and other regulators to ensure a wide range of views are received and are therefore able to feed into our discussions at the BCBS.

1.14 We expect to issue a Feedback Statement in the first half of 2011.

2 Interactions with other proposals

Summary

2.1 The G20 has made several commitments on wide-ranging reforms of the banking and investment banking sectors. These reforms can broadly be split into five areas:

1. 'resolvability' and bank structural reform;
2. capital and liquidity reform;
3. market infrastructure reform;
4. development of a macro-prudential framework; and
5. remuneration.

2.2 This chapter describes how these reforms will affect trading activities and highlights areas of interaction with the recommendations in this DP.

2.3 The pace of innovation in traded markets has led to the related prudential regime taking the form of discrete new rules added to the existing framework. The reforms described in this chapter are part of an overall package to strengthen the financial system, which could be undermined if trading activities continue to be subject to a patchwork of rules that leave opportunities for risks to grow unchecked. A coherent, simpler and more transparent regime is vital to aid longer term confidence in the resilience of firms' trading operations, and we therefore see this fundamental review as complementary to these reforms.

'Resolvability' and bank structural reform

2.4 In April 2009, the G20's London declaration[3] reaffirmed the importance of further work and international coordination on bank resolution arrangements. Shortly after, the Financial Stability Forum (FSF) published its principles for cross-border cooperation on crisis management,[4] of which Principle 8 encouraged firms to maintain contingency plans and procedures for use in a wind-down situation. The EU Commission is now

3 G20 *Declaration on strengthening the financial system*, 2 April 2009
4 FSF Principles for Cross-border Cooperation on Crisis Management, 2 April 2009

considering measures regarding early intervention and resolution. The UK has implemented a special resolution regime for banks (via the Banking Act 2009) and other EU Member States (for example, Germany) are considering whether similar measures are required. Additionally, a wider debate has continued on the structure of banks, notably with the Dodd-Frank Act in the US (see Box 2.1), and the Independent Commission on Banking set up by the UK government.

2.5 The feasibility of recovery and resolution will be significantly affected by the nature of any trading activities undertaken within a firm. The Financial Services Act (2010) requires us to issue rules regarding recovery and resolution plans, and we plan to publish a Consultation Paper in December 2010 on this subject. Any new requirements could impose significant costs on firms who trade a range of complex or bespoke positions, or those who use complex booking practices to transfer risk across group structures. Nevertheless, this does not prevent the need for this review, as banks and investment firms will not be prevented from participating in various forms of trading activities.

2.6 However, in the area of banking structural reform, there is the potential to significantly alter the scope of trading activities within regulated institutions. Even in this area, we believe it is highly likely that trading activities will remain within the sector subject to prudential regulation, and that those activities still need to be backed by a strengthened capital framework. Therefore a strengthened prudential regime for trading activities remains a key component in a sounder regulatory system.

Capital and liquidity reform

2.7 In December 2009 the BCBS released two consultation documents that proposed major reforms to the current Basel II framework.[5] On 26 July 2010 the BCBS oversight body, made up of Central Bank Governors and Heads of Supervision, released a statement outlining the design of the final package that will be agreed in September.

Raising the quality, consistency and transparency of the capital base

2.8 The package will make several changes to the composition of regulatory capital. Two changes will specifically affect trading activities. First, Tier 3 capital is being abolished, bringing into line the quality of capital that is required to be held against market risks with other risks. Second, unrealised gains and losses on some available-for-sale assets will no longer be filtered out of Tier 1 regulatory capital.

2.9 The BCBS has also committed to review the treatment of unrealised gains. Such a review would be similar in nature to some of the recommendations in Chapter 6. We make recommendations to deal with all areas of valuation uncertainty when fair values feed directly into capital resources.

5 *'Strengthening the resilience of the banking sector – consultative document'* www.bis.org/publ/bcbs164.htm, and an *'International framework for liquidity risk measurement, standards and monitoring – consultative document'* www.bis.org/publ/bcbs165.htm

Strengthening the risk coverage of the capital framework

2.10 The package introduces a new capital charge to better capture mark-to-market volatility associated with Credit Valuation Adjustments (CVA), which will directly affect trading activities. This was highlighted by the BCBS as a particular area of weakness during the crisis, which is corroborated by our loss attribution analysis in Chapter 5.

2.11 However, Chapter 5 also highlights the variation of methodologies used to calculate CVA, and we see delivering greater consistency of valuation in this area as equally important as setting appropriate capital requirements. In Chapter 7, we also discuss enhancing the coherence of regulatory capital and consider whether the market risk that crystallises through CVA should be integrated with other market risks.

Asset-based leverage ratio

2.12 The leverage ratio included in the package will cover both banking and trading activities. The choices made in defining total assets, especially the treatment of derivatives, are likely to have the biggest impact on trading activities. The design and calibration of the leverage ratio is intended to be tested during a parallel run period starting on 1 January 2013 and ending on 1 January 2017. The timing of this process means we do not examine it closely in this DP.

Reducing the pro-cyclicality of the framework

2.13 The reforms package also discussed options for reducing the pro-cyclicality of the regime, ranging from top-down measures, such as capital conservation buffers, to bottom-up measures (e.g. forward-looking provisioning). The discussions touched upon both capital resources and capital requirements.

2.14 A number of these measures have progressed since the original package. In particular, the BCBS has been working with the International Accounting Standards Board (IASB) on approaches to operationalise the accounting requirement for expected loss provisioning as a way of introducing a forward-looking provisioning framework. In July 2010, BCBS released a consultation paper on how the proposed countercyclical capital buffer could work in practice.[6]

2.15 The measures outlined in BCBS's December package do not consider, in any detail, ways to deal with pro-cyclicality in the trading book regime, in either capital resources or capital requirements.[7] We therefore believe it is important that this Fundamental Review adequately deals with pro-cyclicality arising from the regime for trading activities. This is addressed through a number of the proposals in Chapters 6 to 8.

6 *Countercyclical capital buffer proposal* consultative document, BCBS July 2010

7 The introduction of the 'Stressed VaR' requirement in July 2009 should provide some reduction in the relative cyclicality of the market risk capital requirements

Review of the liquidity regime

2.16 Finally, the reforms package also included new liquidity standards. These primarily deal with funding liquidity issues, ensuring that appropriate liquid assets are held to withstand liquidity stresses. The package does not consider the implications of market liquidity in the design of a capital framework, which is particularly relevant for trading activities. This is covered in more detail in Chapter 7.

Box 2.1 – The Dodd-Frank Act

The Dodd-Frank Wall Street Reform and Consumer Protection Act (the act) was passed by the US House of Representatives on 30 June 2010. Below are the parts of the act of particular relevance to trading activities.

Capital requirements

The act requires regulators to review and establish capital levels on a consolidated basis for depository institutions and holding companies. Although the act does not provide specific guidance on these new capital levels, it does provide that the capital levels currently in effect will serve as a floor to any new capital requirements. Therefore, banks and bank holding companies should expect higher required capital levels in the future. In addition, the act requires regulations so that capital levels should increase during times of economic expansion and decrease in times of economic contraction, subject to safety and soundness considerations.

Asset-backed securities

The Securities and Exchange Commission (SEC) and federal banking agencies are required to establish regulations to require any issuer of an Asset Backed Security (ABS) to retain five percent (5%) of the credit risk for any asset, including certain residential mortgage assets that the issuer transfers, sells or conveys to a third party.

Volcker rule

The act amends the Bank Holding Company Act of 1956 to limit banking entities' ability to engage in proprietary trading and to own interests in hedge funds or private equity funds. A banking entity must limit its ownership interest in a hedge fund or private equity fund to 3% of the total ownership interests of the fund. The total aggregate of all of the banking entity's interests in such hedge funds or private equity funds may not exceed 3% of the Tier 1 capital of the banking entity.

Regulation of derivatives/swaps

The act establishes a regulatory framework for the derivatives market and restricts federally insured depository institutions from participating in some of the riskiest derivative and swap transactions. In particular, a federally-insured depository institution must establish a separately capitalised affiliate to engage in higher-risk

swap transactions, such as uncleared credit default swaps. A bank must also limit its own swap or derivatives activity to hedging, interest rate swaps or foreign exchange swaps, or similar risk-mitigating activities directly related to a traditional bank's activities, which generally includes assets that are permissible for investment by a national bank.

While a number of these new regulations will restrict the level of trading activities within certain US firms, it is clear that some trading activity will remain and an improved set of capital requirements for those activities is required.

Market infrastructure reform

2.17 A key element of ongoing reform is to review the regulatory and legislative environment in which clearing and settlement operations take place. Specifically, the G20 Pittsburgh statement requires greater use of Central Counterparty (CCP) clearing for over the counter (OTC) derivatives and improvements to transparency in these markets. In June, the EU Commission published a consultation paper containing proposals to strengthen the legislative framework for CCPs and the central clearing of OTC derivatives.

2.18 As we noted in the 2010 *Financial Risk Outlook*:

> 'A CCP can bring consistent and robust risk management practices, as well as acting as circuit breaker to the default of a member. In addition, greater use of CCP clearing can aid market liquidity and efficiency, be a motivating force behind contract standardisation, and reduce systemic risk.'

2.19 Market and prudential regulators' aims should be aligned in most areas, as strengthening the system will only be achieved where participants in derivatives markets are backed by sufficient financial resources. Consequently, we see this DP as complementing these reforms, with particular synergies for encouraging increased contract standardisation and avoiding complexity. An example of this can be seen in the proposed valuation uncertainty charge outlined in Chapter 6.

Development of a Macro-prudential framework

2.20 The G20's declaration on strengthening the financial system in April 2009[8] announced that members had agreed to amend regulatory systems to ensure macro-prudential risks could be identified so that systemic risk in the financial sector could be better addressed. The declaration called on the Financial Stability Board (FSB) and BCBS to develop macro-prudential tools. The FSB has said that it will develop a policy framework by the end of October 2010 to address the moral hazard risks associated with systemically important financial institutions.

8 G20 *Declaration on strengthening the financial system*, 2 April 2009

2.21 New macro-prudential policies are being considered to address two principal sources of systemic risk:

- the tendency for the banking system to become overly exposed to risk in the upswing of a credit cycle and overly risk averse in a downswing; and
- the tendency for individual firms to take insufficient account of the spill-over effects of their actions on risk in the rest of the system.

2.22 In the UK, the Bank of England released a discussion paper in November 2009[9] setting out possible macro-prudential tools that could be implemented. Since then, the government has announced that it will create a new Financial Policy Committee in the Bank of England with primary statutory responsibility for maintaining financial stability and control of macro-prudential tools to ensure that systemic risks to financial stability are dealt with.

2.23 This fundamental review of trading activities should work in tandem with the new macro-prudential initiatives to ensure that macro-prudential objectives are not undermined by the capital regime.

Remuneration

2.24 The G20 communiqué in November 2008[10] noted that inappropriate remuneration structures contributed to the financial crisis. Over the past two years the FSB has been leading work to establish globally agreed principles for sound compensation practices. The FSB published these principles in April 2009[11] and followed this up in September 2009 with a set of implementation standards.[12] In the UK, we have incorporated remuneration requirements into the FSA Handbook through SYSC[13] 19 – the Remuneration Code – (consulted on in CP09/10, *Reforming remuneration practices in financial services*).[14]

2.25 Implementing strong remuneration disciplines and controls should, if done effectively, play a role in reducing the level of risk taken by banks in their trading activities and in influencing firms' valuation and risk measurement practices. These measures should complement, rather than replace, a stronger prudential framework.

Q1: Are the most important interactions with a fundamental review of prudential requirements for trading activities covered in this chapter? If not, what other key interactions need to be considered?

9 '*The role of macroprudential policy*' Bank of England Discussion Paper, November 2009.
10 G20 communiqué '*Declaration – Summit on Financial Markets and the World Economy*', 15 November 2008.
11 *FSB Principles for Sound Compensation Practices*, 2 April 2009.
12 *FSB Principles for Sound Compensation Practices – Implementation Standards*, 25 September 2009.
13 Senior Management Arrangements, Systems and Controls section of the Handbook.
14 In light of the 2010 Financial Services Act and the current European Legislative process that is implementing the FSB principles, we will shortly be publishing a review of the FSA's Remuneration Code.

3 The current framework for trading activities

Summary

3.1 Our prudential framework for banks, building societies and investment firms is based on internationally agreed standards, which are codified into EU legislation through the Capital Requirements Directive. Figure 3.1 highlights key milestones in the development of the international framework since 1988.

3.2 There are three aspects of the framework specifically relevant for trading activities:

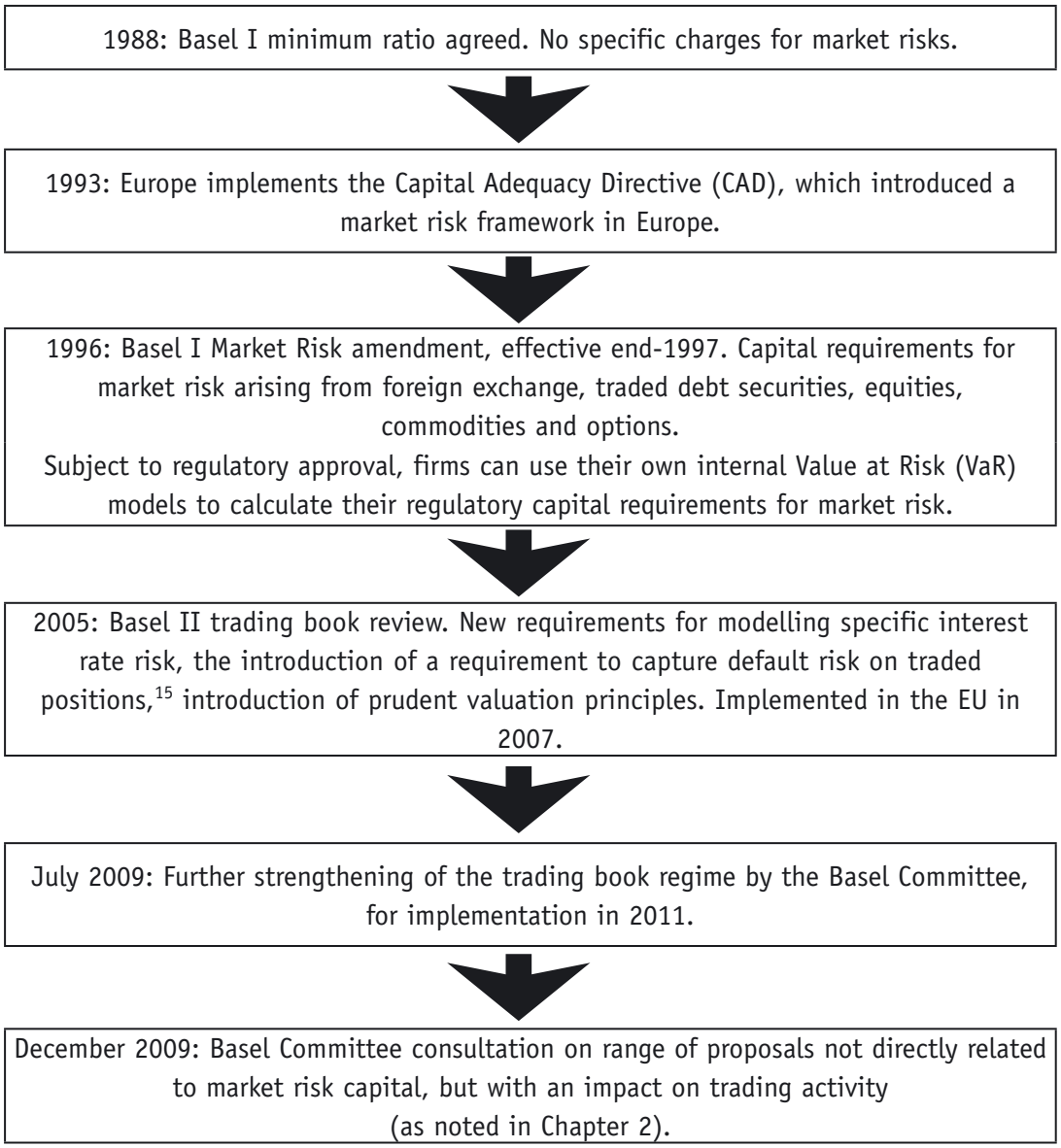
I. The valuation of assets and liabilities, which determine capital resources.

II. The trading book boundary, which defines the positions subject to trading book treatment.

III. The capital requirements applied to those positions in the trading book.

3.3 In each of these areas there are structural deficiencies that need to be addressed by this review, which are covered by the recommendations in later chapters.

Figure 3.1 Developments in prudential framework since 1988



Valuation

3.4 The valuation used in the regulatory framework is based on accounting standards, with a series of filters and adjustments applied to generate capital resources. This is shown in Figure 3.2.

- For all positions fair valued on an ongoing basis, our prudent valuation framework describes limited circumstances – notably illiquidity – under which we expect firms to adjust accounting valuations to better align with regulatory objectives. This is particularly relevant for the regulatory trading book, in which all positions must be fair valued daily.

15 IDRC requires banks to hold capital against default risk that is incremental to any default risk captured in the bank's VaR model. All UK prudentially regulated firms must now hold this, but due to the nature of the European legislation in this area it is not necessarily the case elsewhere.

- For fixed income securities fair valued through equity,[16] we eliminate fair value gains and losses from capital resources. As outlined in Chapter 2, the December 2009 BCBS package removes this filter so that market volatility on all fair valued assets feeds directly into capital resources.
- Adjustments are made to fair value liabilities to filter out movements in own-credit risk.

3.5 A mixed-measurement model is likely to continue in international accounting standards. Under International Financial Reporting Standard 9 (IFRS 9), published in November 2009, from 1 January 2013 financial assets will be held either:

- at fair value through Profit and Loss (P&L);[17] or
- at amortised cost.

3.6 This will not significantly affect the regulatory valuation model described above, but will tend to simplify the framework. Following these changes, we see three areas of specific weakness in the regulatory valuation that need to be addressed.

Inconsistency

3.7 Ensuring comparable valuations across firms can be just as important, if not more so, as applying comparable capital requirements – this is demonstrated in Box 3.1. Within the fair value category, we have identified several areas where the absence of specific accounting guidance has led to material variation in practice across firms – these are described in Chapter 5.

3.8 Inconsistencies can also arise because firms are using different accounting categories for the same instrument type. Although trading activities tend to be subject to fair value, this is not true in all cases (see Chapter 5) and we have observed marked differences between UK firms regarding which positions are subject to fair value. Also, IFRS 9 differs from the direction in which the US is moving regarding valuing financial instruments. In May 2010,[18] the Financial Accounting Standards Board (FASB) confirmed its intention to apply fair value more widely across financial instruments, with limited exceptions only for short-term receivables and payables, own debt, and a small set of strictly defined other investments.

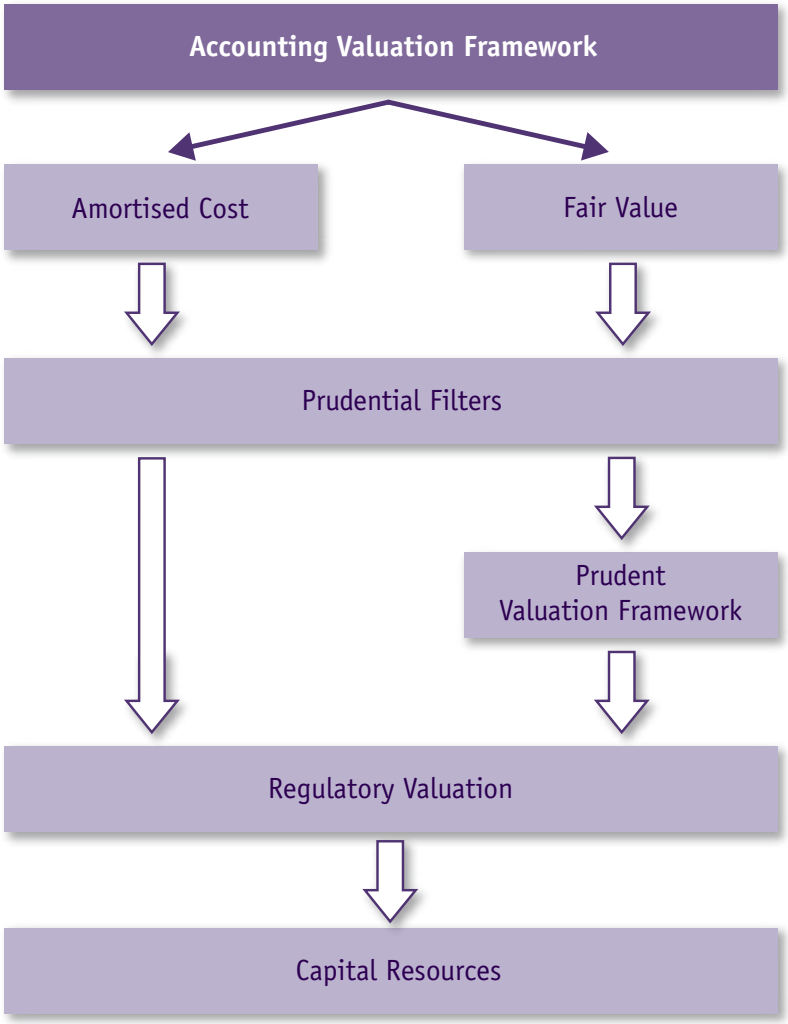
3.9 The international nature of trading activities means it is crucial that regulators take all practical steps to ensure consistent valuation approaches are applied internationally.

16 Gains and losses on these positions do not pass through the firm's profit and loss account.

17 Strategic equity investments will be held at fair value through 'Other Comprehensive Income'.

18 FASB –: Proposed Accounting Standards Update '*Accounting for Financial Instruments and Revisions to the Accounting for Derivative Instruments and Hedging Activities*'.

Figure 3.2: The current valuation framework



Uncertainty

3.10 The current prudent valuation framework is designed to ensure that robust fair values feed into Tier one capital. Adjustments to accounting values may be required for:

- inherently illiquid positions;
- highly concentrated positions; and
- complex securities/exotic derivatives whose values are based on models.

3.11 These standards are currently articulated in a reasonably high-level way and are closely aligned to existing accounting standards. The standards were enhanced in the BCBS July 2009 package to clarify specific circumstances under which an adjustment would be necessary for current illiquidity.[19] However, it is not clear that there is a consistent view among regulators regarding how to deal with the general cases where there is uncertainty due to a range of plausible valuations, and how this uncertainty should feed into capital measures. In practice, we think very little has been done to address this risk on trading positions.

19 These enhancements will be supported in the EU by guidance to be issued by the Committee of European Banking Supervisors in advance of their implementation.

Pro-cyclicality

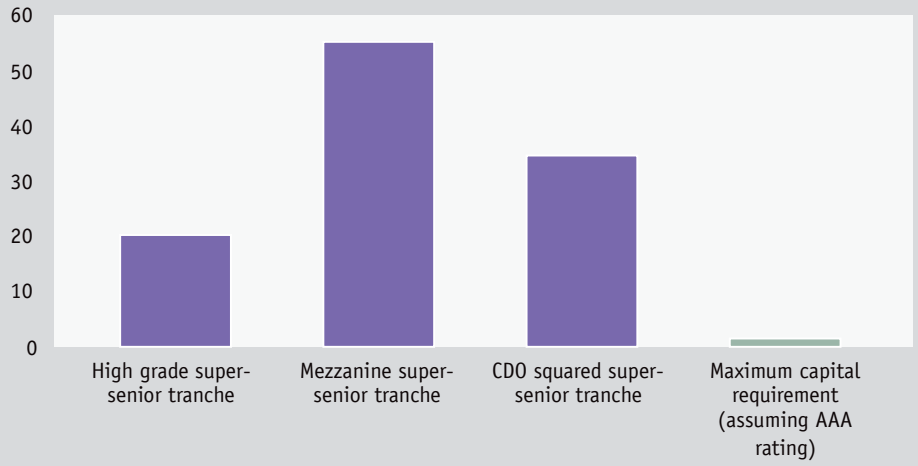
3.12 The use of fair value generally – and specifically the use of mark-to-market as a measure of fair value – potentially allows firms to build up leverage when market values are high, further exacerbating asset bubbles. The recent crisis highlights specific methodological concerns with aggressive valuation practices during this crisis (especially issues concerning bid-offer adjustments and CVA calculations) and wider issues related to the cyclicality of fair value. The prudential framework should moderate aggressive valuation practices where these can be identified and quantified, especially with a view to reducing pro-cyclicality in the upswing.

Box 3.1: Valuation inconsistency compared to capital requirements

In April 2008, the Bank of England's Financial Stability Report analysed the range of values produced by six Large Complex Financial Institutions (LCFIs) at the end of 2007 for super-senior tranches of Collateralised Debt Obligations (CDOs).[20] These tranches were the most senior slice of CDO structures and would therefore be expected to have a AAA credit rating at inception. The chart below shows the maximum capital requirement for such a position relative to the valuation range. In all cases, the maximum capital requirement is smaller than the variation in valuations (highest valuation minus lowest valuation reported) of the tranches produced across the six firms.

This is important when assessing firms' solvency – the difference in valuing an asset between firms is directly reflected in their capital resources. Where the range of valuations for an asset is larger than the capital resources required to be held against it, a firm's position in the valuation range has a more significant impact on assessing the adequacy of capital resources than the capital requirement itself. Indeed, in an extreme case, the capital requirement for a position could be covered by a firm simply revaluing its position from the low end of a valuation range to the high end.

Valuation range vs capital requirement (as % of notional)



Note: Maximum capital requirement assumes market value of the tranche is par, and the note is floating rate.

20 The Bank of England data analysis was done at a high level, and so the CDO tranches analysed did not necessarily have similar underlying collateral or overall structure. Some variation in valuation would therefore be expected. However, we consider that the degree of variation shown by the analysis is significantly beyond what could be accounted for by these issues.

The trading book boundary

3.13 The trading book boundary was introduced internationally in the 1996 Basel Committee Market Risk amendment.[21] The non-trading book (banking book) is the assumed approach for all positions, with entry criteria determining positions that should be subject to trading book treatment. Importantly, the boundary does not affect the capital requirements for foreign exchange or commodity risk, but has the most impact on credit and equity positions; those in the trading book are subject to capital charges based on market risk, while in the banking book these positions are subject to charges predominantly covering default risk. All positions in the trading book must also be subject to fair value, with gains and losses feeding directly into Tier 1 capital, whereas banking book positions can be subject to either fair value or amortised cost valuation.

3.14 'Trading intent' is critically important when determining whether a position is included in the trading book:

> 'A trading book consists of positions in financial instruments and commodities held either with trading intent or in order to hedge other elements of the trading book…Positions held with trading intent are those held intentionally for short-term resale and/or with the intent of benefiting from actual or expected short-term price movements or to lock in arbitrage profits, and may include for example proprietary positions, positions arising from client servicing (e.g. matched principal broking) and market making.'[22]

3.15 Basing the boundary on 'trading intent' is flawed. In buoyant markets, firms demonstrated trading intent for a wide range of positions. In periods of market stress, the inability of the trading book framework to adequately capture the risk on these positions has been exposed – in particular, the ability to hedge and/or exit these positions within a short time horizon was undermined.

3.16 There are several further basic requirements for positions subject to trading book treatment including:

- documented trading strategies;
- actively managing positions, including either daily mark-to-market (MtM) or assessing pricing model inputs daily;
- senior management information on trading positions being an integral part of risk management; and
- documented policies and procedures for monitoring positions against a trading strategy (e.g. monitoring turnover and stale positions).

3.17 Additional detailed standards are specified for those firms that use internal models to calculate market risk capital requirements (see below). There is a need to enforce effective risk control standards across a broader range of functions, which are de-linked from the methodology used for calculating capital requirements and instead act as a minimum standard to undertake trading activities.

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21 In Europe this concept was introduction in 1994 through the first Capital Adequacy Directive.

22 A combination of paragraphs 685 and 687 of the Basel International Convergence of Capital Measurement and Capital Standards June 2006 www.bis.org/publ/bcbs128.htm

Pillar 1 capital requirements

3.18 Our rules allow three alternative approaches for firms to calculate Pillar 1 market risk capital requirements. The standardised measurement method (standard rules) is the most simple, and does not require any specific approval. The CAD1 regime, which can only be used subject to a waiver from us, allows more off-setting between products than standard rules for some options and interest rate risks. Finally, firms can apply for a different waiver to get permission to use an internal VaR model approach, whereby the capital requirements are determined by the firm's own assessment of market risk.

Market risk requirements – standard rules

3.19 The standard rules for market risk apply strict criteria, which generally only allow positions to be offset with each other when risks are:

- linear;[23]
- equal (e.g. the same instrument); and
- opposite (e.g. one is directionally 'long' and one is directionally 'short').

In the case of options, non-linear risks are either approximated to linear risks (when the position is sufficiently in the money) and therefore allowed to off-set, or are only permitted to partially off-set. In the case of securitisations, non-linear risks (e.g. tranches) are not allowed to off-set against linear risks.

3.20 This limited off-setting can effectively provide a barrier to entering certain traded markets, where risks are generally hedged by adding non-matching positions to the portfolio. This leads to a significant incentive for firms to develop an internal model for calculating capital requirements – this may not always be possible for smaller firms.

3.21 Each net position (i.e. after off-setting) is subject to a capital charge based on a simple look-up table that is the same for all firms. A review of these charges is necessary, and is particularly important for the specific risk on fixed income securities where the charges are linked to external credit ratings. The crisis has shown that credit ratings are not an appropriate indicator of market risk.[24] This issue was compounded where the credit rating processes for certain classes of security were revealed as seriously flawed.[25]

23 For a given change in the value of a reference asset there is proportionate given change in the value of the contract held.

24 Credit ratings measure the expected probability of default of a security. This is only one of a number of market and liquidity factors which affects the value of a security that is held for trading purposes and thus is not appropriate as a sole measure of a positions market risk.

25 It is now widely accepted that the credit ratings process was materially flawed for a range of complex structured credit assets such as CDOs backed by mezzanine tranches sub-prime Residential Mortgage Backed Securities (RMBS).

Market risk requirements – the CAD1 regime

3.22 Our CAD1 regime can be seen as a simple form of modelling for the following types of risk:

- **Interest rate pre-processing** – allows firms to recognise more off-setting for general interest rate risk before applying standard rules to the net position.
- **Options delta calculations** – allows firms to produce delta-equivalent[26] measures for option positions that can be passed through standard rules, thereby affording firms a more risk-aligned treatment for delta than is achieved by using the standard treatment of options.
- **Additional options risks** – covers the additional (non-delta) risk associated with option positions. This is generally done by using matrices that apply stresses against movements in underlying variables. Examples typically include volatility skew and implied correlations, but other risks will be relevant if highly exotic derivatives are covered by the CAD1 approach.

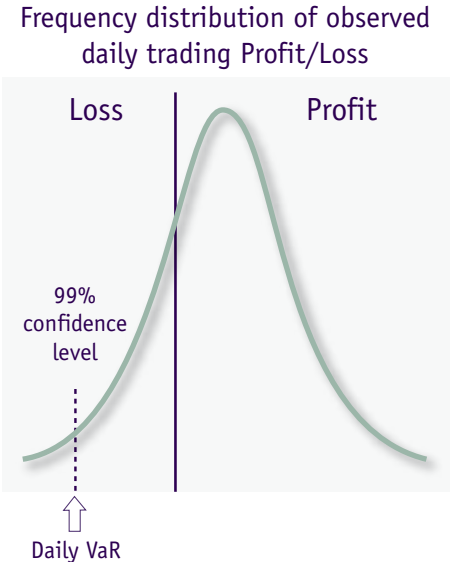
3.23 These approaches tend to deliver more risk sensitive capital allocation, without being beholden to firms' internal modelling methodologies. Consideration should be given to applying this type of approach more broadly.

Market risk requirements – internal VaR models approaches

3.24 Internal models for market risk are based on the VaR concept outlined in Figure 3.3. The modelling standards are set out in the Basel Accord, but over time a range of implementation practices have developed across jurisdictions. This presents a significant risk of a race to the bottom, where risk migrates to those jurisdictions where models are treated most leniently. If this risk is not mitigated, then capital providers and other investors could doubt whether the regulatory capital outputs are sufficiently robust. If internal models continue to be used for regulatory capital, there must be increased international cooperation to guard against this risk.

26 The delta of an option is the rate at which its value changes relative to the movement in the instrument underlying the option. For example, an option on a share in Company X with a delta of 0.5 would have an increase in value of 0.5 if the share price of Company X increased by a value of 1. The delta-equivalent measure for an option is calculated as the value of the underlying position multiplied by the option's delta.

Figure 3.3



3.25 VaR models, if used appropriately, can provide a useful aggregate measure of market risk and can be a useful day-to-day management tool. However, our supervisory experience has highlighted several reasons why VaR modelling has failed to deliver appropriate regulatory capital requirements. Here we note some of the key points:

- The use of a low multiple of a ten-day 99% VaR measure as the primary driver of Pillar 1 capital requirements led to a material under-capitalisation of market risk. This represented a mis-specification of the market risk capital standard.
- VaR measures do not specifically measure the scale of potential losses beyond the percentile that the VaR model is calibrated to.
- Typical VaR model data windows (one to five years) were not long enough to capture risks that emerged during the crisis.
- The multitude of market risk factors that firms are exposed to meant it was not possible for firms to (a) uniquely identify each of these risk factors within the model and (b) appropriately calibrate the high percentile variance and covariance characteristics of each factor. Simplifications were therefore required. However, these simplifications led to (sometimes material) basis risks being missed.
- The constant portfolio assumption in the current regulatory VaR measure means dynamic hedging costs are not adequately captured. We also think that firms fail to hold sufficiently large valuation adjustments to properly capture future portfolio hedging costs.
- VaR models are not able to capture the wide range of model risks inherent in the mark-to-model position valuations they take as model inputs.
- VaR does not capture the 'gap risk' inherent in certain trading positions, which can lead to material losses. This gapping was often associated with the absence of secondary market liquidity, which meant that the deleveraging mechanism/ arrangements could not be enacted.

3.26 A similar range of deficiencies have been highlighted in academic literature, particularly focusing on the pro-cyclical impacts of VaR[27] and the related build-up of systemic risk in the financial sector. There is no single response to these issues, as some could be addressed by enhancing existing VaR techniques, while others relate to a structural weakness of VaR as a statistical risk measure. However, an important element of this appraisal of VaR (or any other risk measure) must be a recognition that the objectives of individual firms for measuring risk are in many cases not aligned with regulators objectives in setting minimum capital standards that will apply to all firms across the system.

Differences between the capital approaches for market risk

3.27 The internal model approach allows a firm to imply diversification and off-set between all positions included in the model, which is vastly different to the philosophy of the standard rules, where off-setting is strictly limited. This difference means that, for some portfolios, the level of capital delivered by standard rules requirements is many multiples of that required under the internal model approach. In extreme cases, the consequence of removing a firm's permission to use the model could threaten the solvency of the firm, which can limit the set of tools realistically available to regulators when deficiencies are found. This problem is compounded as model deficiencies tend to be revealed in stressed times when further capital-raising would be difficult.

3.28 Narrowing the disparity in the capital standard across all firms should be a key outcome of this review.

Amendments since Basel II – 2005 and 2009

3.29 In 2005[28], the BCBS reviewed trading book specific elements of Basel II and recognised the need to capture default risk on traded credit positions that is incremental to that captured by the ten-day 99% VaR model. As the financial crisis developed, it was agreed that this did not go far enough and in July 2009 the BCBS consulted on a package of amendments to the current trading book capital requirements. The key elements of the July 2009 package are summarised in Figure 3.4.

3.30 This package of amendments represents a major change in the capital requirements applied to the trading book, in particular raising the 'capital standard' for credit products and bringing it in line with the banking book (the Internal Ratings Based approach (IRB)). However, a comparable capital standard does not necessarily mean comparable capital. The IRB approach makes certain assumptions regarding portfolio granularity, which may or may not apply in the Incremental Risk Charge (IRC). Firms' IRC models might also use market implied data to determine correlations that can be applied across long and short positions, whereas the IRB approach specifies correlations to systematic factors and applies credit risk mitigation only to exactly matching positions. These continued differences in treating credit risk across the banking and trading books need to be reviewed.

27 See for example *Risk Appetite and Endogenous Risk*, Danielsson, Shin and Zigrand (2009) and *Liquidty and Leverage*, Adrian and Shin (2008).

28 The application of Basel II to trading activities and the treatment of double default effects: www.bis.org/publ/bcbs116.htm.

3.31 In addition, the stressed VaR requirement mitigates some of the weaknesses in VaR as a capital measure highlighted above. In particular, it significantly increases the implied capital standard from the current level and helps mitigate the relatively short time period required by the current framework by locking in a historical period of stress. However, it does not address some of the more structural weaknesses of VaR described above.

Figure 3.4 Key elements of Basel July 2009 package

Proposal	Positions effected	Description	Impact/Capital standard
Stressed VaR	All modelled positions	Additional capital charge based on stressed calibration of VaR model inputs	• Increase in capital requirements for modelled positions • Reduction in relative cyclicality of VaR capital requirement • Stressed market inputs mean higher implied capital standard
Incremental risk charge (IRC)	With the exception of securitisation positions, all credit positions for which the firm models specific risk	Firms must capture incremental (to VaR) credit default and migration risk on modelled credit products in the trading book	• Improves risk capture on traded credit positions • Increases resilience of banking system to credit risk shocks • Comparable to banking book approach
Comprehensive risk measure (CRM)	Positions that are within a firm's correlation trading portfolio	Requirement to model 'all price risks' for these predominantly structured CDS books	• Improves risk capture for correlation portfolio • Calibrated to one year 99.9% level
Standard rules for securitisation positions	Securitisation positions that are not deemed to be correlation trading positions	Removal of non-correlation book securitisations from modelling approaches and application of banking book risk weights to net positions	• Reduces scope for regulatory capital arbitrage on securitisation products • Expected to lead to significant increase in capital requirements

Counterparty Credit Risk (CCR)

3.32 CCR on all OTC derivatives and Securities Financing Transactions (SFTs) is calculated in line with banking book credit risks. This fails to recognise the MtM nature of this risk that arises from fluctuations in the credit quality of the derivative counterpart – captured through CVA. The BCBS December Consultation Paper[29] focuses on this issue, requiring a new capital charge to cover the fair value losses that arise through CVA.

3.33 However, in delivering a long-term approach to capture CVA volatility, regulators must also address issues relating to CVA calculation. We see a wide range of practices, leading to significant divergence of valuation output. This divergence undermines any attempts by regulators to deliver convergence in this area, and until a common set of requirements are agreed, it will remain difficult to generate a capital charge that appropriately captures this risk for all banks.

29 www.bis.org/publl/bcbs164.pdf

The current framework in practice

3.34 The practical application of the current framework described above to each asset class that firms hold on their balance sheet is summarised in Annex 1.

3.35 Trading assets often make up a large percentage of a firm's total assets, but commonly account for a much smaller percentage of a firm's capital requirements – a figure from *The Turner Review* is reproduced in Figure 3.5.

Figure 3.5 Trading book assets and capital 2007: examples

	Market risk capital requirement as percentage of trading assets	Trading assets as percentage of total assets	Trading/Market risk capital as percentage of total capital requirements
Bank 1	0.4	34.0	11.0
Bank 2	0.4	28.0	7.0
Bank 3	0.1	57.0	4.0
Bank 4	1.1	27.0	7.0

Source: BIS estimates from bank annual reports

3.36 In October 2009, the Basel Committee published interim analysis of the Quantitative Impact Study for the 2009 amendments.[30] These results show that the average increase in market risk capital cross the surveyed banks would be at least 224%, which goes some way to addressing the current undercapitalisation of market risks. The focus of this review should therefore be the structural deficiencies of the regime – however, further recalibration might be necessary subject to the results of the ongoing prudential reforms described in Chapter 2.

30 www.bis.org/publ/bcbs163.htm

4 The evolution of traded markets

Summary

4.1 This chapter is divided into two sections:

- Section A summarises the growth in traded markets over the past 20 years.

  This growth has increased the importance of the trading book regime to the soundness of the banking system and reinforces the need for this review, as the current framework has not kept pace with market developments. There is also some evidence that, during the crisis, liquidity remained stronger in simpler and standardised markets, potentially highlighting factors that could reasonably be used in the capital regime and that are discussed in Chapter 7B.

- Section B discusses some structural differences that are evident between these markets, in particular the difference in credit markets.

  These structural differences suggest that a different (non-market based) approach to credit might be justified on the basis that much less of the credit risk, relative to other risks, ever passes out of the banking system despite vastly increased trading volumes. This leads to some key recommendations in Chapter 7A.

A. The growth of traded markets

4.2 Over the past 20 years, most asset classes have seen a material increase in the level of trading activity. This is often relatively easy to observe and measure through publicly available information. A second phenomenon – an increase in the complexity of the products traded – is more difficult to track and quantify in most markets, but is something we have clearly seen evidence of.

4.3 The difficulty in directly tracking this increase in the level of trading in complex products comes in part because complex products are often originated by combining several more simple products, and such issuance is not routinely tracked. One area that has seen well-documented increases in complex instruments is structured credit. However, this is not the only area of increasing complexity – for example, there has been significant trading (and significant losses) in areas such as equity correlation,

Constant Maturity Swaps (CMS) and Power Reverse Dual Currency (PRDC) bonds – some of which we discuss in this DP.

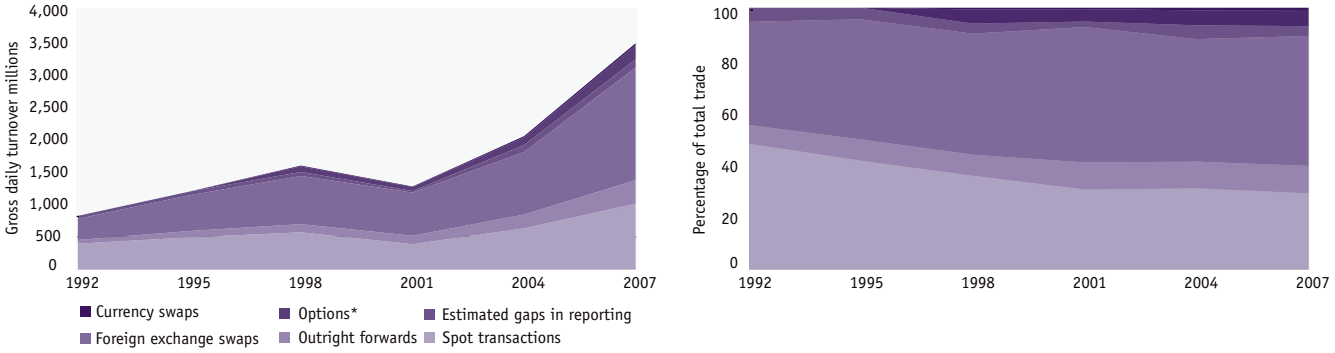
4.4 In this section we show summary data on the growth of the five most significant markets in the financial sector:

- foreign exchange (FX);
- traded credit;
- interest rates;
- equities; and
- commodities.

FX markets

4.5 The FX markets remain largely decentralised for OTC trading and are the world's largest (on a gross market turnover measure), with a daily market turnover of $3.5trn[31] in 2007. These markets continue to be dominated by simple products, with around 90% of the OTC market comprised of traditional forward and swap contracts (see Figure 4.1). However, given the size of these markets, even a small level of complex transactions in percentage terms would represent a significant market. While pure FX risk has not been a major source of trading losses during this crisis, FX products have caused significant losses in previous crises, such as the 1997 Asian financial crisis. FX risk is also increasingly packaged with other risks in complex products, such as PRDC notes.

Figure 4.1 FX markets growth



Source: BIS
*data not collected until 1995

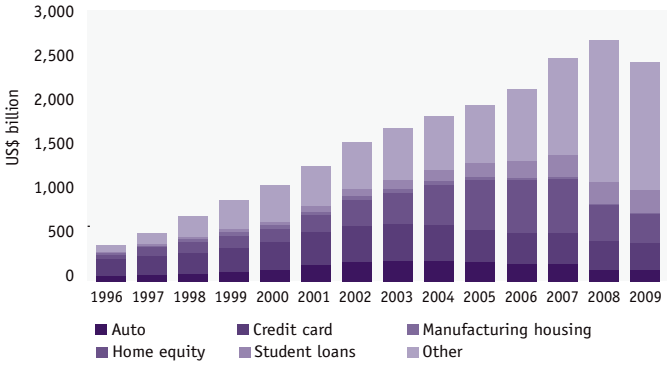
31 Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity in 2007 – www.bis.org/publ/rpfxf07t.pdf – figure includes 'traditional' FX as well as options and currency swaps.

Traded credit markets

4.6 One of the most striking aspects of traded credit markets over the last 20 years has been the explosion in the size and complexity of securitisation and structured finance activities and the credit derivative markets. In *The Turner Review* and accompanying DP09/2, we explained our view that the demand for yield uplift, stimulated by macro-imbalances, triggered a wave of financial innovation, focused on the origination, packaging, trading and distribution of securitised credit instruments. This resulted in:

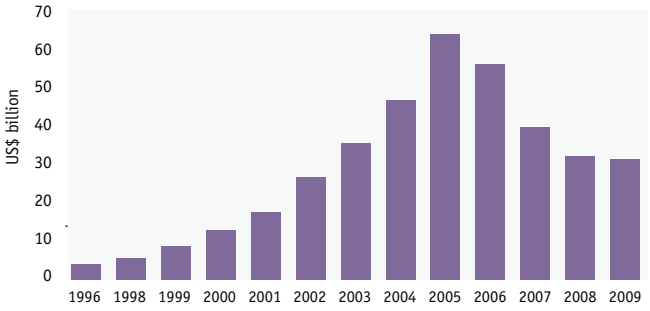
- rapid growth in the value of the total stock of credit securities;
- a significant increase in the complexity of, and in some cases embedded leverage within, the structured finance securities sold (particularly Asset Backed Securities (ABS)); and
- a related explosion in the volume of credit derivatives, enabling investors and traders to hedge underlying credit exposures, or to create synthetic credit exposures.

Figure 4.2a Outstanding ABS notional



Source: SIFMA

Figure 4.2b Outstanding CDS Notional



Source: BIS

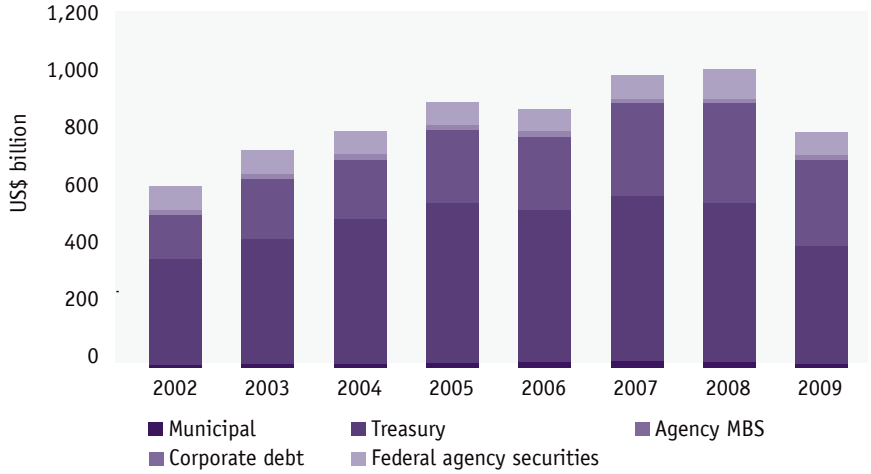
4.7 This financial innovation was based on the premise that by repackaging risk it was possible to 'create' value, offering investors combinations of risk, return and liquidity that were more attractive than those available from directly originating or purchasing the underlying credit exposures. It resulted not only in massive growth in the importance of securitised credit, but also in profoundly changing the nature of the credit origination. Following the crisis, there is a question about what the long-term size of this market will be.

4.8 Since the crisis broke, volumes in CDS have dropped off sharply. Some of this reduction is due to portfolio compression where off-setting trades between counterparties are "torn up". In ABS, volumes have remained artificially high as many banks have issued securities to access government liquidity schemes (see Figure 4.2).

Interest rate markets

4.9 While there has undoubtedly been a huge growth in new and innovative markets in the credit area, there has also been an increase in trading in the more standardised, longer established fixed income and interest rate markets, as shown in Figure 4.3.

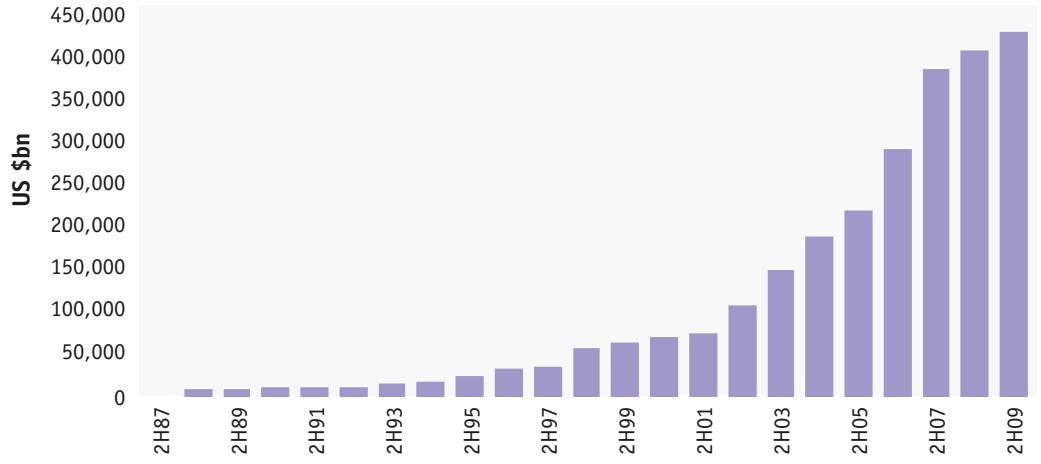
Figure 4.3 Average daily trading volume in US bond markets



Source: Federal Reserve Bank of New York, Municipal Securities Rulemaking Board, FINRA

4.10 In the OTC market, interest rate products saw a more dramatic ten-fold growth in outstanding notional in the ten years leading up to the financial crisis, as shown in Figure 4.4. Although there has been some growth in more complex areas, such as interest rate options, the majority of this growth has been driven by simple interest rate swap products. While the market itself has not seen significant innovation, interest rate products have, however, been integral building blocks of more complex securities and structured products that have evolved.

Figure 4.4 Outstanding interest rate and cross-currency swap notionals



Source: ISDA

Equity markets

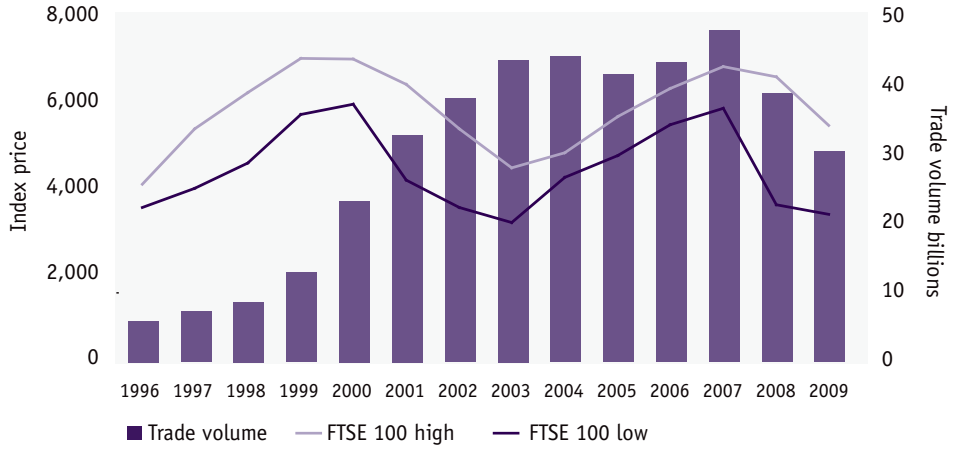
4.11 Figure 4.5 shows a general trend of growth in equity trading volumes in the last 15 to 20 years – however, since 2000 this growth pattern has been less evident, particularly in more established indices such as FTSE 100 and Dow Jones. Part of this lower growth will be due to the increased investor interest in emerging equities markets.

4.12 Before the implementation of the Markets in Financial Instruments Directive (MiFID) in 2007, cash and directive equity markets were largely exchange-based. However, the introduction of MiFID has seen established regulated markets challenged, in particular from multilateral trading facilities (MTFs). In the 2010 Financial Risk Outlook (FRO) we noted:

> 'In 2009, MTFs accounted for around 20% of total trading in FTSE 100 shares, and approximately 25% of order-book trading...while competition in trading services is welcome, potential risk from the fragmentation of equity trading and data have resulted and need to be appropriately mitigated.'

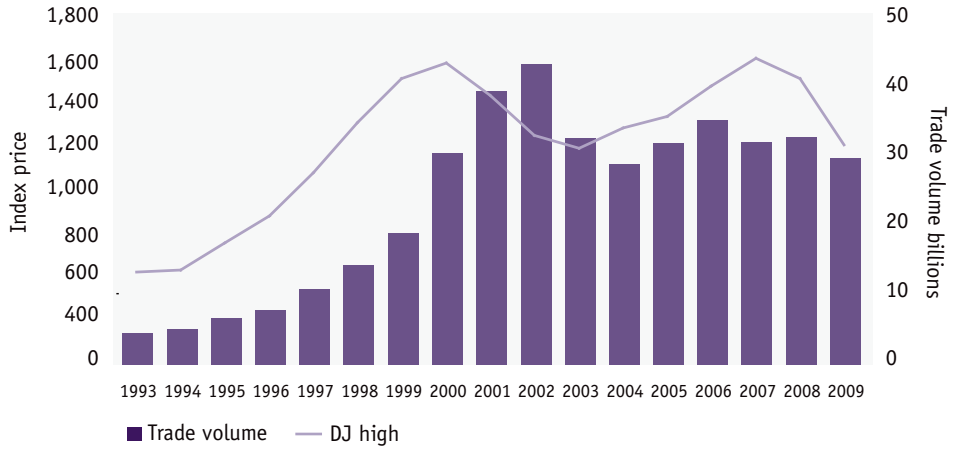
4.13 Significant developments in the Information Technology (IT) power available to trading platforms and participants has also seen the advent of High Frequency Trading (HFT). HFT now makes up a much greater part of overall equity trading. The 2010 FRO suggested that HFT has grown from virtually zero to 60-70% of trade in US markets and 30-50% of trade in EU markets over the past decade, and may lead to further increases in trading once the crisis has ended.

Figure 4.5 Equity trading volumes in major markets



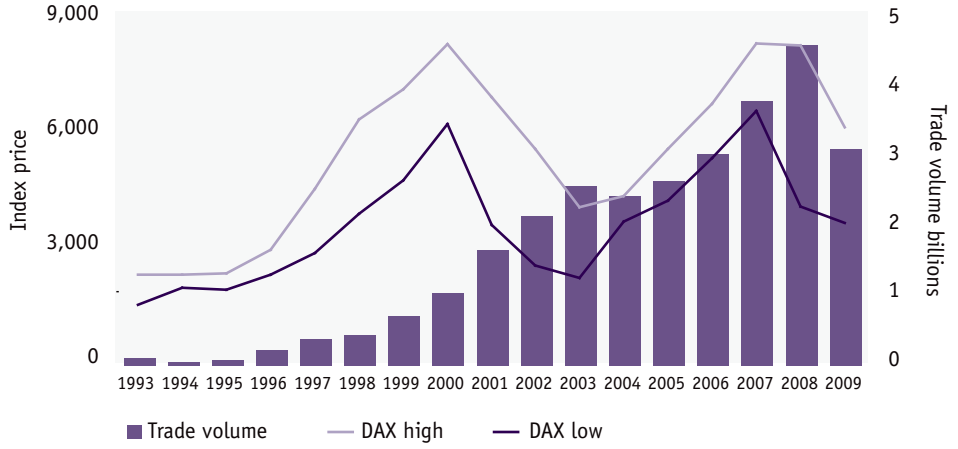
Source: Bloomberg

Dow Jones



Source: Bloomberg

DAX



Source: Bloomberg

4.14 Dealers' derivative portfolios have continued to grow and become more complex, exposing them to greater risk. Before the crisis, dealers had developed structural positions in dividends and implied correlations. All dealers tended to be 'the same way round' in these exposures (long dividends and short implied correlation) as a result of selling similar derivative products to investors. These one-way positions are difficult to hedge and/or close out, and the change in market fundamentals (e.g. reduced dividend expectations, high realised correlation) led to material losses at many dealers. Box 4.1 gives an example of this.

Box 4.1 Equity derivative losses

The first half of 2008 saw significant losses in equity derivatives businesses, which were picked up by our loss analysis (see Chapter 5). Some of the key drivers of losses were spikes in volatility and correlation, combined with a drop in dividend expectations.

Ten-day volatility on the Dow Jones Eurostoxx 50 index moved from 13.44% on 17 January 2008 to 62.89% by 30 January. This spike in volatility crucially coincided with a sharp rise in correlation across global markets. Add to this a significant reduction in dividend yields, and financial institutions faced potential exposure to significant unexpected market moves.

As a result of structured products sold to retail clients (typically relatively simple products such as shorter-dated yield-enhanced products that relied on selling options to boost returns, or reverse convertibles) financial institutions were significantly exposed to all these movements.

The losses suffered highlighted several issues that the capital framework is not well-placed to capture. VaR models are not good at capturing dividends or implied correlation, and the additional risks from crowded trades are typically ignored. Significantly, they also highlighted instances where firms did not hedge risks that were seen as driving profits.

Commodities markets

4.15 The years leading up to the financial crisis saw significant growth in the notional value outstanding of commodity OTC derivatives. Between 2003 and 2007 the notional value increased more than 500%,[32] reaching $9trn by the end of 2007. Exchange traded commodity contracts also saw significant growth over the same period, although to a lesser extent than OTC trading (200% growth over the same period).

4.16 However, each commodity market has developed at a different rate. For example, some crude oil benchmarks are now heavily traded on exchange markets, whereas a number of other commodity markets remain highly specialised, small and predominantly OTC. As a result of these idiosyncrasies, it is difficult to place accurate estimates on the total size of certain individual commodity markets. In addition, the growth rate in each of these markets has not taken place in an even or stable manner.

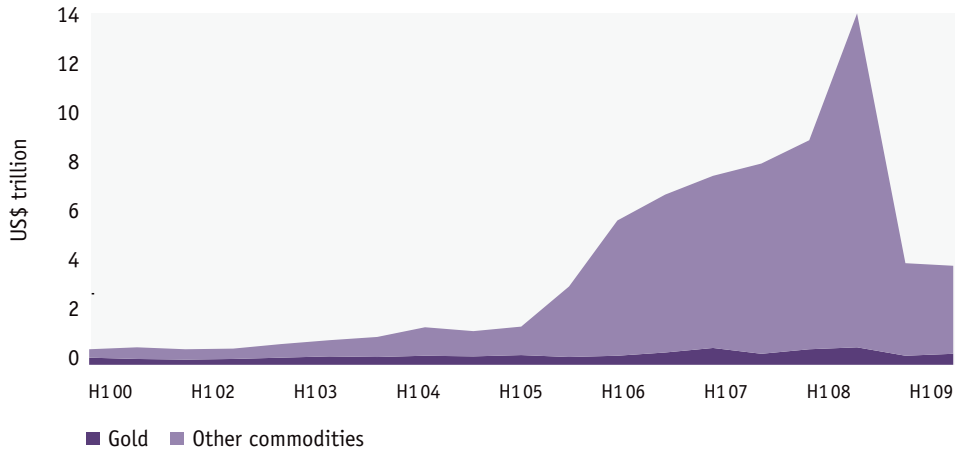
4.17 Bank for International Settlements (BIS) data (figure 4.6) shows the dramatic growth in OTC commodities market trading, largely driven by trading in energy markets and non-precious metals.

4.18 In exchange-traded markets, BIS data shows a similar pattern of increased trading. In these markets growth was driven by derivative trading, particularly in agricultural contracts and energy (both of which saw significant price rises over the same period) based on increased investor interest/development of new financial products.

32 Based on figures on growth between 2003 and 2007 produced by IFSL Research "Commodities Trading 2008", June 2008

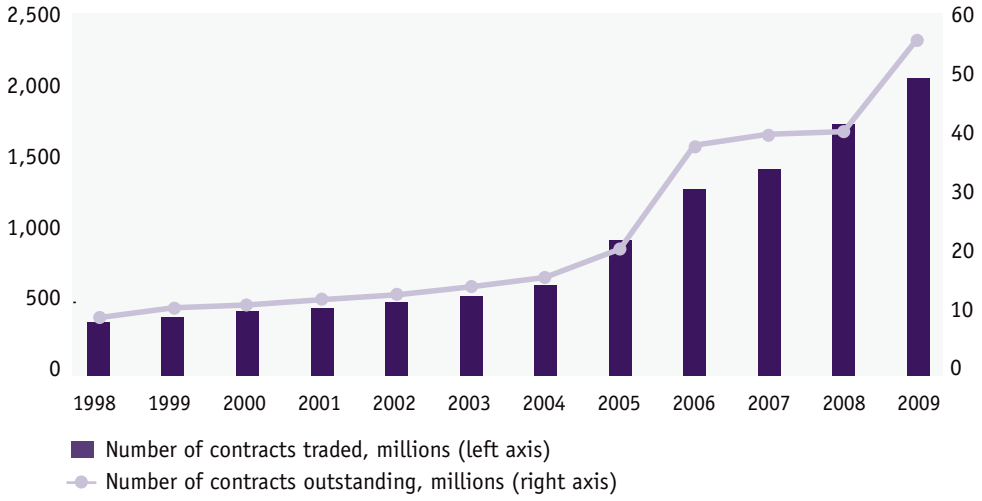
4.19 The early stages of the crisis triggered significant falls in OTC commodities markets, which are particularly evident in Figure 4.6. Exchange traded contract volumes avoided a similar fall, which is likely to be due to the reduced counterparty risk inherent in exchange traded products leading to a 'flight to quality' in this market.

Figure 4.6a Outstanding OTC derivatives notional



Source: BIS

Figure 4.6b Exchange traded contracts



Source: BIS

B. The structure of traded markets – is credit different?

4.20 While all of the key markets have shown to some degree similar characteristics of growth, there is evidence that the underlying structure of each market shows significant variation. This is particularly apparent in traded credit markets.

4.21 Intuitively, a hypothesis that the interaction between the banking system and credit markets is significantly different to the banking system's interaction with other markets appears reasonable. The banking system as a whole acts as a credit provider

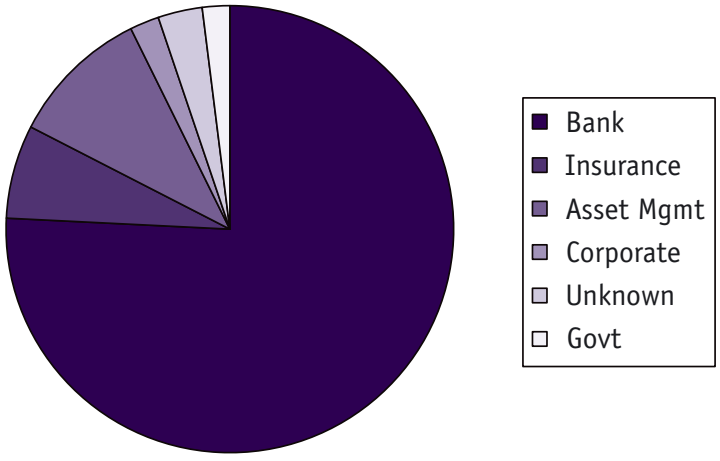
to the real economy, but it is not a significant equity provider or, historically, a commodity buyer. With the exception of small proprietary trading operations, positions in those markets tend to be taken as a result of intermediary activity. Finding data to test these intuitions is difficult – however, data that is available does support the hypothesis.

4.22 For example, for equities markets, The Office for National Statistics (ONS) reported that on 31 December 2008 less than 4% of the shares (by market value) listed on UK stock exchanges were held by banks[33] (see Box 4.2).

4.23 The data for credit markets shows a different picture. The rise of securitisation and credit derivative technology, leading to more commoditised credit products, might have led many to believe that credit risk was being transferred out of the banking system and therefore less would remain on firms' balance sheets (we describe above the considerable increase in credit trading during the period leading up to the crisis). However, there is evidence that the overall risk of credit products largely remained within the banking/investment banking sectors, particularly in the more complex areas of traded credit.[34]

4.24 The Joint Forum report on credit risk transfer, updated in 2008,[35] qualitatively corroborates this story. In particular, the report notes the importance of the shadow banking sector (conduits and Structured Investment Vehicles (SIVs)) as credit purchasers, financed by short-term funding through Commercial Paper and Medium Term Notes. So sponsors either kept the credit risk (through issuing liquidity lines) or passed it onto (predominantly junior) note holders. As the junior tranches of SIVs ('capital notes') received ratings, these became attractive to small and medium-sized banks. Chart 4.1 summarises our analysis undertaken in October 2007, which showed that banks held 76% of SIV capital notes.

Chart 4.1 Holders of SIV capital notes



Source: Rating agency data and FSA analysis

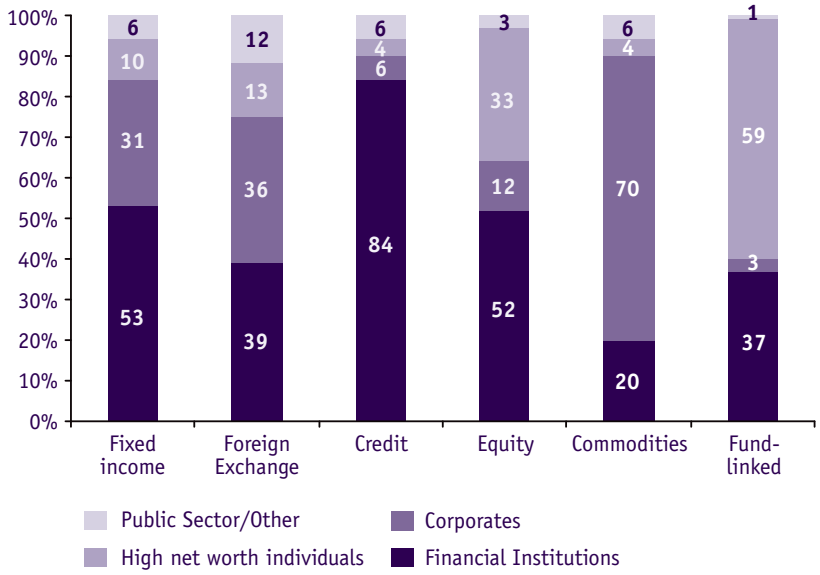
33 ONS Share Ownership Survey 2008 (published January 2010) showed banks held UK listed shares worth £40.6bn compared to a total value of listed shares of £1,158.4bn. Some have disputed the figures reported by the ONS, but primarily on the basis that the size of individual and company director share ownership in much greater than reported rather than issues with the level of bank share ownership.

34 This is supported by evidence of the increased originating and repackaging of credit risk into forms that made it eligible for inclusion in the trading book.

35 www.bis.org/publ/joint21.htm

4.25 Although there is evidence to suggest that equity tranches of CDOs were passed out of the banking system (see Box 4.2), this transfer is far short of the sum total of issuance. This is also the case in other securitisation sectors.

Figure 4.7 Customer breakdown of OTC derivative dealers' revenues by asset class



Source: Markets Trends from the 2007 Global Capital Markets Survey, McKinsey

4.26 These differences between credit and other markets are not isolated to securitisations. Figure 4.7 shows a similar situation in OTC derivatives markets. Financial institutions are much more prevalent in the credit derivatives market when compared to OTC markets for FX, commodities, fixed income and equity. This is an important feature, 84% of credit derivatives being transacted with financial institutions highlights that the CDS market acts much more as an intermediary within the banking sector than across the real economy. The overall level of credit risk within the sector could be seen to broadly remain unchanged, despite the re-packaging of risk into tradable format.

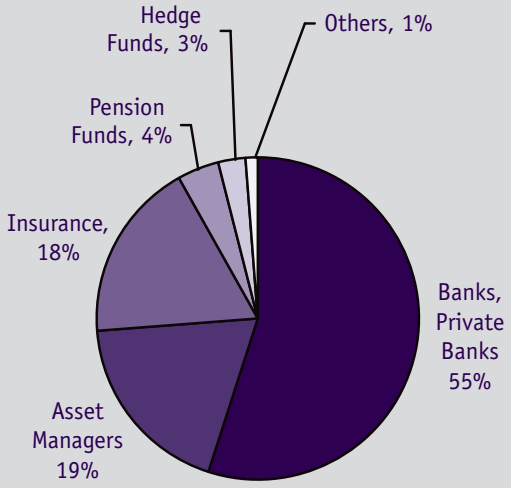
Box 4.2: Risk retained in the banking sector in CDO markets

The residual risk from CDO markets is retained within the banking sector to a greater extent than other markets.

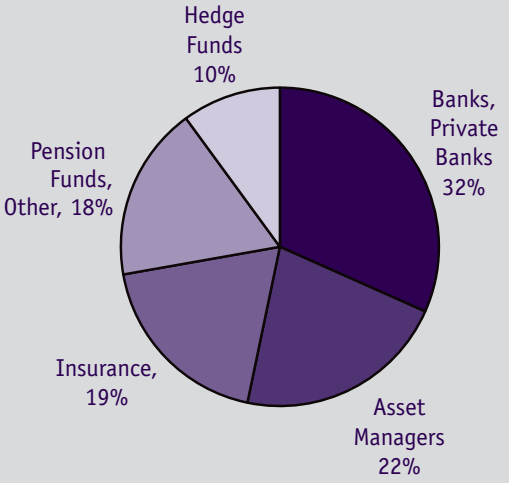
CDO market – Significant holdings retained by banks

For investment grade portions of the CDO market, over 50% of the buyers were banks.[36]

Buyers of investment-grade portions



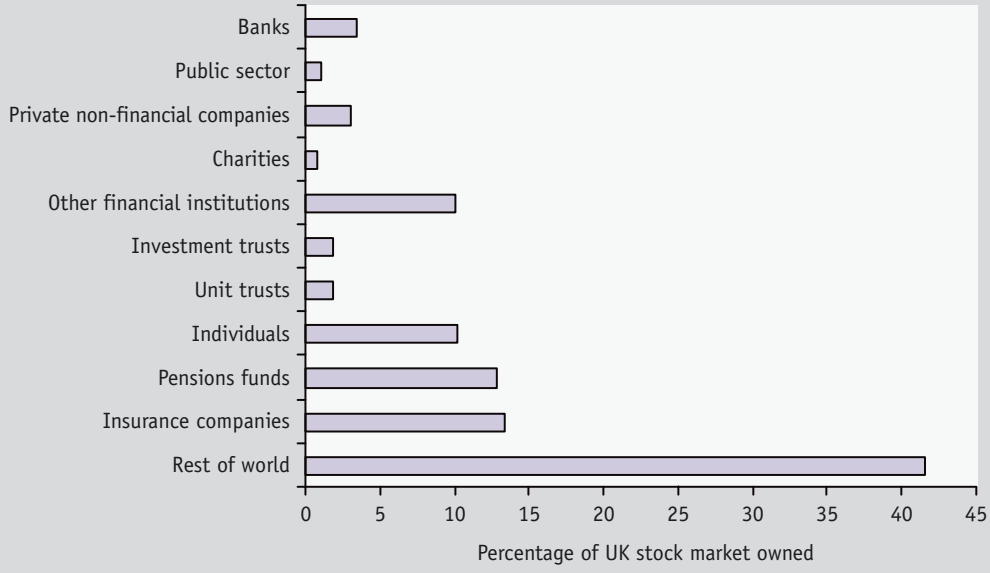
Buyers of riskiest portion, equity, unrated



UK equity market – Banks act as intermediary

In contrast to the CDO market, banks retain only 4% of the UK stock market.

Equity market participants



36 Based on 1996 – 2006 data, quoted in Bloomberg Markets, July 2007

5 Lessons from the crisis

Summary

5.1 This chapter is divided into two sections:

- Section A gathers data from the crisis to present conclusions on areas of weakness in the current regime.
- Section B brings together the conclusions of Section A with those of Chapters 3 and 4 to describe the key elements that need to be addressed. These are then mirrored in the recommendations of Chapters 6, 7 and 8.

A. What the crisis has taught us

Analysis of losses suffered in investment banking activities during the crisis

5.2 In 2009 we conducted a study of the losses suffered in the investment banking operations of major international banks operating in the UK. Its purpose was to analyse where losses occurred and how the regulatory regime was placed to cover the risks that crystallised. We collected data from ten firms on significant loss events[37] from January 2007 to March 2009. In total, the losses analysed amounted to $240bn. Box 5.1 analyses the extent to which the capital held against these positions was sufficient to cover these losses.

37 A threshold of $100m was used to define a 'significant loss'. This level typically meant that firms produced detailed analysis, for internal reporting purposes, of the losses at the time they were incurred.

Box 5.1: Were capital requirements sufficient?

Capital sufficiency at a firm level

The need for governments to intervene to aid the re-capitalisation of banks during the crisis can be seen as evidence that levels of minimum required capital were insufficient to maintain investor confidence.

However, we can also use the data from the losses study to take a more quantitative view on the extent to which this was the case. The total losses over the period for which data was received can be compared with the average level of market risk and credit risk capital held over the period. At this level, as shown in Chart 5.1, losses amounted to approximately 160% of the total average market and credit risk capital held by the banks during the period.[38] However, this analysis needs to be reviewed with caution for the following reasons:

- The data does not include profits made during the period, which will offset these loss events. In all cases, total net profit/loss was covered by the average capital held.
- The overall minimum capital level is designed to cover all risks to the balance sheet, not just those that arise due to the investment banking activities covered by the study.
- The loss study is biased as it only includes firms that survived the crisis, therefore by definition the firms in the sample had sufficient capital to remain as going concerns.
- Minimum required capital is not designed to absorb losses, but to ensure that the firm is able to re-capitalise privately. The structure of regulatory capital (including buffers) is being redesigned as part of the BCBS December package.

In general, we see the level of loss events exposed in this analysis as evidence that overall capital requirements against trading activities were insufficient.

Capital sufficiency at a product level

Data from other sources during the crisis tends to suggest that capital was not sufficient for particular products. For example:

In April 2008, the Bank of England reported that the average valuations of six large financial institutions' super-senior tranches (rated AAA at inception) at the end of 2007 ranged between approximately 80% of their notional amount to as low as almost 20%.[39] This indicated losses of between 20% and 80% of notional. The capital required to be held against floating rate AAA notes such as these was around 1.6% of notional.

38 Firms were not requested to provide their market and credit risk capital for each month during the period analysed, this was only requested for months in which a significant loss (as defined for the purpose of our study) was incurred. The figures are therefore not a complete reflection of average capital over the period.

39 *Financial Stability Report*, April 2008, Bank of England

In March 2008, the ABX index[40] price for the AAA tranche (a guide for valuing AAA tranches of subprime RMBS) ranged from 50 – 85 (indicating market losses of up to 50%), depending on the vintage of the index. Chart 5.2 shows how the implied losses compared to the capital that would have been required to be held against a floating rate AAA tranche.[41]

While the data presents a varied picture on capital requirement sufficiency at a firm level, there is specific evidence of inadequacies in the regulatory capital regime at a product level. One of the aims of the fundamental review should be to identify and target those areas where this issue needs to be addressed.

Chart 5.1 Average Capital vs Total Losses

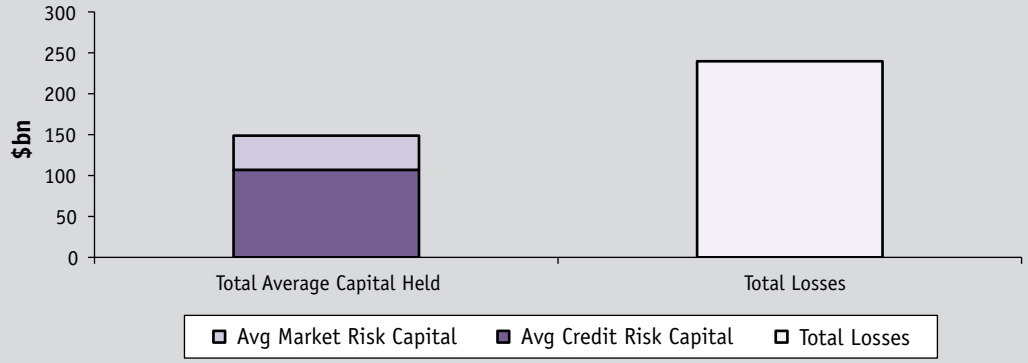
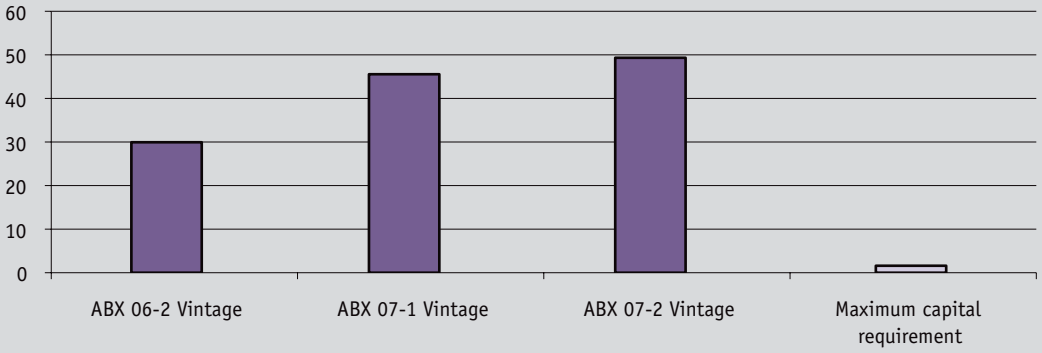


Chart 5.2 Implied losses at March 2008 for AAA tranches of sub-prime RMBS (%of notional)



Source: ABX Index prices as quoted by Markit

40 The ABX has five separate indices based on the rating of the underlying security, from AAA to BB. Each index is constructed by averaging the quoted prices from roughly 20 trusts and then approximate the movement of the market in subprime mortgage backed securities. It should be noted however that the index only serves as an approximation of the value of subprime RMBS.

41 The capital requirement illustrated assumes that the market value of the tranche is par.

Loss drivers

5.3 Table 5.1 breaks down the losses by asset class[42] and regulatory classification at the time of the loss. The three largest categories of loss, accounting for 75% of the total, were attributable to structured finance activities, which will include:

- positions held in 'securitisation warehouses';[43]
- retained tranches from completed securitisations;
- holdings of ABS and CDOs in trading portfolios;
- providing finance against ABS or whole loan portfolios;
- exposure to ABS losses through off balance sheet structures that were taken back onto firms' balance sheets, or through lines of liquidity to third party vehicles; and
- CVA on monoline counterparties who wrote protection on these assets.

5.4 The structured finance losses tended to arise across many different lines of business, suggesting that firms did not appreciate the inter-linkages between different activities and consequently did not sufficiently factor these into risk measurement approaches.

5.5 This data corroborates the qualitative discussion in Chapter 4 regarding the structure of credit markets and the appropriateness of the differentiated banking book and trading book treatments for this asset class. Although this study focused solely on 'investment banking' activities (i.e. trading activities), these figures highlight the extent of losses that arose on securitisation activities, which re-package the risk that would traditionally arise out of 'banking' – i.e. the provision of credit to the real economy.

5.6 The level of losses arising through CVA also highlights the importance of this as a risk. There were two aspects to these losses:

- Those arising from concentrated exposures to monoline insurers who provided protection against super senior CDO tranches.[44] The insurers' fate was highly correlated with the performance of the assets they were protecting, so that falling values for CDO tranches resulted in losses that, in some cases, eliminated the entire capital base.[45]
- Those arising from outside the monoline sector. Concerns over the soundness of counterparties were also a key driver of the loss of liquidity in a number of markets and demonstrate the importance of counterparty risk. Included in the 'other CVA losses' category of Table 5.1 are $1.5bn of losses on Credit Derivative

42 Based on firms' own classification of losses, combined with their descriptive comments on losses.

43 Before the crisis many banks had warehoused credit positions that they intended to, or were in the process of, securitising. Once the crisis began and demand for securitization issuance evaporated some banks were left with a large 'warehouse' of positions.

44 A large part of this exposure was due to 'negative basis' trades. These trades earn the difference in the spread between the cost of the protection provided by the monoline insurer and the spread earned on the super senior tranche. Some were a result of firms securitisation activities which left them holding super senior tranches that they wished to hedge; other firms actively sourced investments in super senior tranches in order to perform the trade.

45 For example in November 2007, the monoline insurer, ACA Financial Guaranty Corp., reported a $1bn loss, wiping out its equity and resulting in a negative net worth.

Product Companies (CDPCs[46]), and $4.5bn relating to other CVA losses. This latter category, not directly linked to CDO markets, highlights the importance of addressing underlying issues about the management of CVA exposures.

5.7 Other losses, such as those linked to equity derivatives and interest rate derivatives, emphasise the failures in product risk management outside structured finance. At any other time, these losses would have been considered highly material, and so cannot be ignored. Box 5.2 shows a case study of material losses outside the structured finance area that were evident in the analysis (an example is also shown in Box 4.1).

Table 5.1

FSA categorisation by product type/asset class	Trading book ($bn)	Banking book ($bn)	Total ($bn)
Super Senior CDOs with ABS underliers	53	34	87
CVA counterparty losses on monoline insurers (who provided protection for super senior CDOs)	28	9	37
ABS assets (failed securitisations, SIVs, conduits etc)	16	35	51
Leveraged loans	4	14	18
Corporate credit derivatives (index and bespoke)	11		11
Counterparty defaults	6	2	8
Other CVA losses (including CDPCs)	6		6
Equity derivatives (mainly volatility and correlation losses)	4	1	5
Hedge Fund derivatives and financing (Madoff losses)	3		3
IR derivatives (yield curve and IR volatility losses)	3		3
Vanilla credit derivatives (single name CDS and Index)	3		3
Emerging markets (mainly credit spread moves)	2		2
Corporate bond trading	2		2
FX trading	1		1
Government bond trading	0.5	0.5	1
Commodities trading	0.5		0.5
Total	**144**	**96**	**240**

Trading Book versus Non-trading book

5.8 Chart 5.3 shows the split of losses, by value, across regulatory books. 22% of losses were on positions held in the regulatory banking book at the inception of the trade, suggesting that many firms operate material investment banking operations in the banking book, and that we cannot exclude considerations of the banking book from this review.

5.9 Table 5.2 shows the extent to which loss-making positions had moved between the trading book and the banking book. 26% of all losses, by value, were in positions that switched from trading book to banking book during the period

46 CDPCs are (typically) highly leveraged businesses largely focused on selling credit default swap contracts.

analysed, but there was no evidence of loss-making positions moving from the banking book to the trading book during the period. This might corroborate the suggestion in Chapter 3 that the boundary between trading book and banking book was not effective.

Box 5.2: Losses outside structured finance during the crisis

Yield curve losses

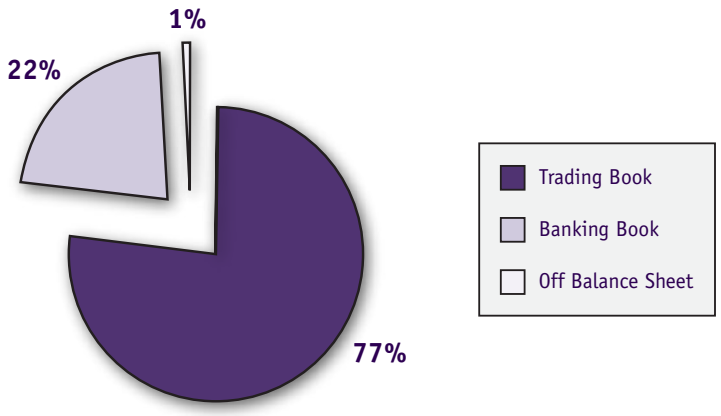
Constant Maturity Swaps (CMS) are a useful example of losses suffered in complex products outside the structured finance area. CMS products allowed investors to take a view on the shape of the yield curve on a forward basis.

In 2005, following high levels of growth in this market, there was speculation that some banks may not have been modelling the products accurately[47] due to pricing variations. A wide variety of methodologies existed – however, it was clear that no firm had a complete solution to modelling the products.

The products had great difficulties linked to risk management. In particular, shifts in the yield curve that resulted in an overall inversion would require significant and rapid re-hedging. This happened in June 2008, when the euro interest rate curve inverted – the rapid hedging that ensued forced the curve to shift even further, producing a feedback effect that firms were not prepared for, which increased losses.

The losses caused by these negative feedback loops are an area that the current VaR methodology typically cannot capture, and that is not addressed via other regulatory measures.

Chart 5.3 Split of losses across regulatory books



47 See, for example, *A difference of opinion*, Risk Magazine, 1 October 2005.

Table 5.2

Regulatory classification at inception	Regulatory classification at time of loss	Regulatory classification at March 2009 (if different)	Total ($bn)
Banking book			**53**
Off-balance sheet			**2**
Trading book	Trading book	Unchanged	123
	Trading book	Banking book	21
	Banking book	Unchanged	41
Trading book total			**184**
Total			**240**

Accounting classification

5.10 Table 5.3 shows the losses incurred and their respective accounting classification. Most (93%) investment banking losses incurred were in positions held at fair value, but there were material losses ($15bn) incurred on instruments held at amortised cost. This confirms the importance of increasing consistency of accounting classification for trading activities highlighted in Chapter 3.

5.11 International Accounting Standard 39 (IAS 39) and IFRS 7 were amended in October 2008 enabling firms to switch accounting classification of some financial instruments.[48] However, 95% of losses, by value, arose from positions that did not change accounting classification at all, and only 1% of losses were reclassified before any loss was incurred. Only two firms had losses for which the accounting treatment had changed. Although this shows limited evidence of switching between accounting classifications, any position that switched from fair value to amortised cost would likely show more limited recognition of losses during the period and therefore may not have been captured in the analysis.

5.12 The data highlights a disconnect between the fair value boundary in the accounting framework and the trading book boundary in the regulatory framework. Table 5.4 shows that around 30% of the total losses analysed were incurred in positions that were held at fair value but that were in the regulatory banking book. These positions lost value due to market movements which will directly affect capital resources, but these positions were not subject to a market risk capital charge – this represents a significant gap in the regulatory framework.

48 Reclassification of Financial Assets (Amendments to IAS 39 Financial Instruments: Recognition and Measurement and IFRS 7 Financial Instruments: Disclosures), IASB, October 2008 – this amendment allowed non-derivative assets to be reclassified out of the fair value through profit and loss category if the intention of the entity was to hold the financial asset for the foreseeable future or until maturity.

Table 5.3

Accounting classification at time of loss	Credit risk	C/party default	CVA	Market risk	Total losses ($bn)
Available for sale (AFS)	20				21
Fair value – Held for trading (HfT)	45	7	43	99	194
Fair value option (FVO)	5	1		3	9
Held to maturity	2				2
Loans and receivables	13				13
Total	**85**	**8**	**43**	**103**	**240**

Table 5.4

Accounting classification at time of loss		Regulatory classification at time of loss	
Fair value (including AFS, HfT and FVO)[49]	225	Trading Book	144
Amortised cost	15	Banking Book	96

5.13 Four key themes emerge from this study:

i) the level of capital held against certain risks was insufficient;

ii) the trading book boundary allowed a structural arbitrage – not sufficiently addressing the presence of market risk on banking book items and credit risk in trading books;

iii) gaps in firms' risk management and controls frameworks led to material losses in a wide range of products; and

iv) counterparty risk transmitted through CVA volatility was a large loss driver, but there were no specific requirements to capture this in capital requirements.

Analysis of the dispersion in firms' valuations during periods of illiquidity

5.14 In the second half of 2009, we analysed valuation approaches, and the resulting valuations produced by six UK banks in areas where valuation uncertainty was believed to exist as of 30 June 2009. Valuations reported by banks were benchmarked against one another for the same or similar positions to determine the dispersion between the bank's valuations and the benchmark.

49 The current regulatory framework applies a filter to AFS positions to remove unrealised gains, as such the regulatory valuation treatment is adjusted from fair value. In total these positions account for $20bn of losses.

Monoline CVA

5.15 The analysis showed severe disparities in monoline CVA methodologies applied across firms. In the most extreme case, re-valuing one firm's portfolio using the benchmark methodology[50] would have led to a valuation adjustment of $4.7bn. This highlights the importance of comparable valuations across firms described in Chapter 3.

CVA measures outside the monoline sector

5.16 There was also significant dispersion in firms' calculations of CVAs for non-monoline counterparties. The limited accounting guidance when calculating CVAs under either IAS or US Generally Accepted Accounting Principles (GAAP), and the limited attention paid in general to the area before the financial crisis, led to several approaches being applied. Particular areas of difference were whether to:

- calibrate CVA to counterparty default probabilities implied from the market or to use historical values;
- include adjustments relating to the firm's own credit risk when calculating CVA; and
- calculate a CVA on OTC derivative counterparties who were subject to collateralisation agreements (in some cases certain uncollateralised OTC derivative counterparties, such as sovereigns, were also excluded from CVA calculation).

OTC derivative valuation, including bid-offer methodologies

5.17 We found a wide range of approaches to bid-offer adjustments,[51] where there is a similar lack of guidance in accounting standards. Not only was there no consensus methodology, but we also found structural inconsistencies in approaches, suggesting that current adjustments do not properly reflect close-out costs:

- The use of the market maker exemption.[52] In some cases, this was applied to less liquid or highly concentrated positions and therefore the assumption of being able to exit at a mid-price may not be valid.
- Some firms simply made no bid-offer adjustment as they interpreted their valuation methodologies to be sufficiently conservative and therefore already incorporated adequate adjustments.
- Whether and how to net across products before calculating bid-offer adjustments. There was clear evidence of some firms aggressively considering bid-offer adjustments at a group level based on positions across different legal entities.

50 The calculation of this impact is based on the difference in valuation if positions were remarked using the average CVA submitted by the firms in the review for each monoline exposure (the average was calculated after removing the highest and lowest CVA for each monoline party).

51 Dealers tend to mark their derivative portfolios to mid-market valuations and then make these adjustments to get their valuations to an exit price required by accounting standards.

52 The accounting and regulatory frameworks allow firms to not apply a bid-offer adjustment in cases where they are a significant market-maker and are therefore able to trade out of positions at a mid price valuation.

5.18 We also found specific valuation issues for OTC derivatives,[53] including weaknesses in Independent Price Verification (IPV) processes concerning illiquid positions. IPV analysis often focused only on the closeness of the valuation to average consensus levels, without assessing the valuation uncertainty linked to model risk and model calibration risk, demonstrated by large valuation ranges around mean levels.

5.19 Our analysis highlights two key issues:

i) significant uncertainty and opacity in valuation, particularly in markets that were not resiliently liquid; and

ii) a general lack of consistency in approaches to fair value in several specific areas where clear guidance was not provided, including:

a) incorporating counterparty credit risk; and

b) the approach to applying bid-offer adjustments.

Back-testing data on the performance of internal models during the crisis

5.20 We routinely collect data to analyse the frequency and size of VaR back-testing exceptions,[54] together with their causes, to understand how reliable internal models have been at predicting losses.

5.21 This data shows a significant rise in the number of exceptions reported during key points in the financial crisis, particularly in August 2007, April 2008, and November/December 2008 (with the latter date showing the largest exceptions linked to the impact on the market of Lehman Brothers' collapse). At the same time, the size of exceptions also increased.

5.22 The level and size of exceptions generally took over a month to return back to more 'normal' levels, indicating that the models used were not only poor at predicting losses, but also did not recalibrate quickly to losses when they appeared in the market. The causes of these time lags were discussed in The Turner Review, including how historical data is used to populate models and how often the data is updated.

5.23 In addition to the time lags, the following weaknesses in VaR arrangements led to the high level of back-testing exceptions:

i) difficulties in calibrating VaR models, so volatilities and correlations were underestimated due to benign historical market conditions;

ii) risk factors (e.g. implied correlations and dividends that underpinned the losses described in Box 4.1), which drove losses that were not sufficiently captured by the VaR models;

iii) concentrated positions and crowded trading strategies/positions were not adequately captured by VaR models, so that any parameters calibrated to liquid markets proved illusory; and

53 OTC derivatives covered by the study include: Inflation swaps and options, Bermudan swaptions, First-to-default baskets, and single tranche synthetic CDOs.

54 A regulatory back-testing exception occurs when a firm suffers a loss on a day that is in excess of that calculated by its regulatory VaR model at the end of the previous day. For back-testing purposes VaR is calculated on a one day 99% confidence interval, thus implying that 2.5 exceptions should be experienced over a year (250 business days).

iv) unreliable P&L figures, leading to some positions being re-valued on a less frequent basis, meant that the true volatility was not captured within VaR.

5.24 However, the back-testing data merely highlights the reality of the VaR measure as it was designed. Although it can be a good measure of risk during non-stressed periods, the capital standard to which it is set in the current regime (discussed in Chapter 3) does not adequately capture the infrequent and severe stress events, which is precisely the risk that regulators should be concerned about.

5.25 By locking in a period of stress, implementing stressed VaR is a significant improvement. The calibration chosen by the BCBS also leads to a material increase in trading book capital. However, stressed VaR is subject to many of the serious shortcomings described above, and will particularly suffer as changing products and markets render historical data from the relevant stressed period obsolete. So while stressed VaR will improve the situation in the short to medium term, other ways of capturing risk must be implemented in the longer term.

Other qualitative data sources

5.26 A wide range of research is available that has informed our views on issues raised by the crisis. In particular, several bodies have produced useful analyses of the impact of valuation uncertainty, and the leverage and pro-cyclicality linked to the use of fair value.

The Committee on the Global Financial System

5.27 The Committee on the Global Financial System[55] (CGFS) has considered the pro-cyclical impacts of valuation and leverage. Its report in April 2009[56] concluded that extensively using fair value accounting may have encouraged market practices that contributed to excessive risk taking or risk-shedding in response to observed changes in asset prices (Chart 5.4 shows how the risk-shedding process could be driven by valuation practices).

5.28 The CGFS's report also highlighted potential policy options concerning valuation that are independent of the debate over pro-cyclicality, especially ideas for introducing requirements to hold valuation reserves when valuations are subject to material uncertainty. They highlight two particular advantages to such an approach:

i) it incentivises financial activity away from more complex securities; and

ii) it would limit a firm's ability to recognise profits where those are less reliable.

5.29 Other studies also cite the pro-cyclical impact of fair value,[57] but this is not universally accepted, others have indicated that fair value had a limited impact on banks' capital during the crisis.[58]

55 The CGFS is a central bank forum for the monitoring and examination of broad issues relating to financial markets and systems. Its members are deputy governors, other senior officials of central banks, and the Economic Adviser of the Bank for International Settlements. The committee reports to the Global Economy Meeting, which comprises a group of 31 central bank governors.

56 CGFS – *The role of valuation and leverage in procyclicality*, April 2009.

57 In addition to the CGFS's report, the IMF released a study in 2008 concluding that fair value may magnify the cyclical volatility of capital – *Fair Value Accounting and Procyclicality*, IMF Global Financial Stability Report, 2008.

58 See, for example, *Fair Value Accounting: Villain or innocent victim*, Federal Reserve Bank of Boston, January 2009.

The Committee of European Banking Supervisors

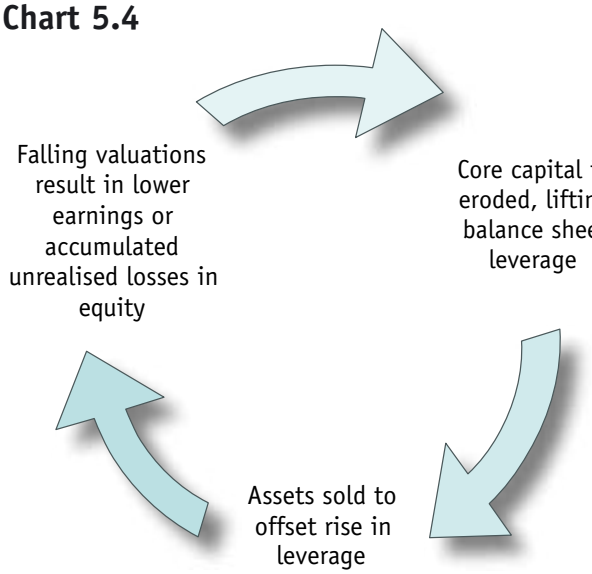
5.30 The Committee of European Banking Supervisors (CEBS) issued a report in March 2009[59] assessing the measures taken by accounting and auditing standard setters and institutions regarding valuation during the financial crisis, which discussed the theme of valuation uncertainty.

5.31 In its report, CEBS identified a need to improve the quality of banks' valuation methodologies and processes and urged the IASB to provide further guidance on calculation methods and disclosures to ensure consistency in the following key areas:

i) own credit risk for liabilities held for trading;[60] and

ii) day one P&L.[61]

Chart 5.4



The Institute of International Finance

5.32 The Institute of International Finance (IIF) issued a report in December 2009[62] identifying weaknesses and proposing improvements in many areas of bank practice.

5.33 The IIF identified the need for better guidance on valuation methodology in illiquid markets and, in particular, cited the need to identify and incorporate sources of uncertainty into the valuation approach, including instrument-specific valuation adjustments.

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59 CEBS – *Assessment of measures taken with respect to the issues raised in the CEBS June 2008 valuation report*, March 2009.

60 Adjustments for own credit risk are valuation adjustments to take account of movements in the market's perception of a firm's credit quality. These movements would mean that for a liability held at fair value, deterioration in a firm's credit quality would result in the value of the liability being reduced and therefore a gain recognised on the position.

61 Day 1 profit and loss is the difference between the fair value of a position on the day it is transferred and the consideration received.

62 IIF – *Reform in the financial services industry: Strengthening practices for a more stable system*, December 2009.

B. What needs to be considered when reforming the regime?

5.34 Bringing together the above data and the discussion in the previous chapters, we believe there are three broad categories of issues that need to be addressed in the fundamental review, which are discussed in detail in the following chapters:

i) valuation;

ii) coverage, coherence and the capital framework; and

iii) risk management and modelling.

Valuation

5.35 Particularly for trading activities, a robust valuation framework is vital when assessing solvency. Current valuation practices can undermine confidence in reported capital resources. The following three areas need to be addressed in the fundamental review:

i) poor capture of valuation uncertainty as a risk factor;

ii) the lack of agreed and prudent valuation approaches for key trading items, such as bid-offer adjustments and CVA; and

iii) inconsistency of valuation approach across jurisdictions, particularly between fair value and amortised cost.

5.36 Cutting across these issues, in particular (i) and (ii), should be steps to deal with the pro-cyclicality of capital resources delivered by the valuation approach.

Coverage, coherence and the capital framework

5.37 The current capital framework can be incoherent and misses important risks, leading to significant structural arbitrages. The following five areas need to be addressed:

i) the continued arbitrage between the banking book and trading book for default risk through market-implied measures of risk;

ii) the poor capture of market illiquidity as a risk (including the assumption of liquid hedging markets);

iii) the failure to capture in Pillar 1 the interest rate risk of banking book assets;

iv) the failure to capture certain elements of counterparty credit risk - in particular CVAs; and

v) insufficient capture of specific risk factors driving losses during the crisis, including the additional risk in complex products. In particular the capture of:

   a) contingent market risk;

   b) gap risk; and

   c) hedging risk.

Risk management and modelling

5.38 In the past, regulators have placed undue reliance on firms' internal VaR models as a measure for regulatory capital. The models themselves were poor at capturing the risks that regulators should be most interested in, and the risk environments that the models were operated in were not strong enough to control the complex trading risks.

5.39 The following four areas need to be addressed:

i) incomplete regulatory oversight of trading risk management;

ii) alternative measures of trading risks to enhance the current internal models framework;

iii) inconsistent standards for modelling across jurisdictions; and

iv) the significant difference between standard rules and internal models.

Q2: Do you agree that the issues described above are the key issues that should be addressed in the fundamental review? If not, what other issues should also be addressed?

6 Valuation

Summary

6.1 The valuation approach applied to balance sheet assets and liabilities – and any assumptions made in its application – is vital when assessing solvency, as it is directly linked to the reliability of reported capital resources.[63] We have highlighted in Chapters 3 and 5 the relative importance of valuation and, for trading positions particularly, regulators should ensure that sufficient focus is given to valuation issues. Reported valuations, and issues linked to the approach to the audit of those values, particularly when there is uncertainty, was also discussed in the FSA Discussion Paper DP10/3 'Enhancing the auditor's contribution to prudential regulation'. We see this DP as complementing and enhancing that discussion specifically as it relates to trading activities.

Key recommendations			
No	**Key issue**	**Recommendation**	**Details**
1	Poor capture of valuation uncertainty as a risk factor	**A Pillar 1 capital charge to capture valuation uncertainty**	Valuations always contain an element of uncertainty, particularly in times of stress. This uncertainty represents a risk to the solvency of firms, and the regulatory framework should require firms to hold capital against this risk.
2	A lack of agreed and prudent valuation approaches for areas such as bid-offer adjustments and CVA	**Robust guidelines to ensure firms adopt prudent valuations**	Differences between the level of prudence in the accounting approach to valuation and the prudence required by regulators result in a need for detailed regulatory valuation guidance for specific areas where methodological guidance is not given in accounting standards or where the guidance given there does not meet regulatory requirements. The prudential filters framework should also be within the scope of the fundamental review to ensure valuation adjustments remain consistent in their rigour across all positions.

63 The importance of valuation from an investors' perspective was also discussed in the FSA Discussion Paper DP09/5 *Enhancing Financial Reporting Disclosures by UK Credit Institutions*.

Key recommendations			
No	**Key issue**	**Recommendation**	**Details**
3	Inconsistency in valuation approach across jurisdictions between fair value and amortised cost	**A system of regulatory valuation adjustments to ensure a greater consistency in balance sheet valuation approaches**	Regulators and investors desire a level playing field in valuation approaches to ensure consistently reliable reported capital resources. This consistency is not evident in the current or anticipated accounting frameworks under US GAAP and IFRS. Valuation adjustments should be applied by regulators to set the valuation approach (fair value or amortised cost) to a consistent basis across jurisdictions based on a set of regulatory valuation principles.

Dealing with valuation issues

6.2 We continue to support a mixed model valuation approach where some instruments are held at amortised cost and others are at fair value. The new approach outlined in IFRS 9 helps to simplify the classification of financial assets and we still believe that using these valuations as a starting point, and then applying regulatory tools to adjust either (or both) the valuation approach and/or the valuation result where accounting valuation is inconsistent with regulatory objectives, is the most practical approach for a regulatory valuation framework.

Valuation uncertainty

6.3 Valuations always contain some uncertainty, stemming from the range of plausible assumptions that could be applied in determining the value of an instrument. The existing regulatory framework implies that valuation is known with certainty[64] and that capital requirements should cover risk to that valuation arising from changes to external parameters (e.g. market variables or default). As shown in Chapter 3, this uncertainty can often be larger than the capital requirement.

6.4 Valuation uncertainty tends to be mitigated through increased diligence, rather than considering the range of plausible valuations that could be determined for an instrument, taking into account the uncertainty around the parameters that drive the instrument's value. However, this uncertainty means there is a risk that the value realised on the sale of a position will differ from the valuation relied upon by a firm, even when a plausible assessment of risk has not changed.

6.5 This uncertainty represents a risk to the future solvency of the firm, which is not captured by the current framework.

6.6 Factors affecting valuation uncertainty can be split between two broad aspects: methodological uncertainty; and supply/demand uncertainty.

64 Some capital measures might implicitly include measures of valuation uncertainty, but there is no measurement of this uncertainty.

Methodological uncertainty

6.7 Methodological valuation uncertainty comes from the difficulty of assessing, discounting and risk-adjusting the cashflows generated by a traded position. This uncertainty is exacerbated when valuation models need to make assumptions around the ability to risk manage and hedge uncertain cashflows on an ongoing basis. This form of uncertainty will be greater for structured and/or exotic positions.

Supply/demand uncertainty

6.8 Supply/demand uncertainty is associated with instruments traded in less active markets. In these markets, reported valuations can often only be realised during periods of robust market liquidity, as the valuation includes a liquidity premia[65] that will only be realised when other market participants believe the market is liquid. This means that valuation uncertainty can arise on positions that are subject to mark-to-market, as well as those that rely on modelled valuations.[66]

Required steps

6.9 Chapter 3 outlined the current approach to dealing with valuation uncertainty through a series of valuation adjustments (the prudent valuation framework), which have been enhanced through the July 2009 BCBS package.[67] These tools allow us to address issues related to methodological uncertainty and to consider a true assessment of market liquidity as at the valuation date. We already plan to take steps to ensure this framework is applied more effectively to capture these aspects of valuation uncertainty. As part of this effort, new proposals from the IASB to require disclosures on measurement uncertainty for level 3 assets[68] (as defined in IFRS 7) may provide useful input to the application of the prudent valuation framework for those positions (although we would expect prudent valuation adjustments to be required across a broad range of positions, not only those classified as level 3 for reporting purposes).

6.10 The application of the improved current prudent valuation framework, however, only considers 'current' liquidity and does not factor in the resilience of that liquidity over time. We believe this issue is critical to understanding the true uncertainty in valuation.

6.11 We believe that a better way to capture valuation uncertainty, and to bring together all of the aspects that affect it, would be the introduction of a new capital requirement based on a calculation of both methodological and supply/demand uncertainty inherent in instrument valuations. Capturing the uncertainty in a capital requirement would reflect the fact that the uncertainty represents a future risk to the firm.

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65 In this context, the liquidity premia is the additional price a market participant is willing to pay to hold a liquid instrument compared to a hypothetical identical illiquid instrument.

66 The financial reporting framework classifies positions as level 1, 2 or 3 depending on the level of market data that is involved in their valuation. This is clearly an indicator of valuation uncertainty, and a prudential approach to this issue may be able to be driven partly off this classification. It is likely however that valuation uncertainty from a prudential perspective may need to be calculated on a more granular level.

67 We note that the Committee of European Banking Supervisors will also be producing guidelines on the application of the enhanced prudent valuation framework before its implementation.

68 IASB Exposure Draft ED/2010/7 *Measurement Uncertainty Analysis: Disclosure for Fair Value Measurements*.

6.12 When covering supply/demand uncertainty in such a capital charge, it will be necessary (either implicitly or explicitly) to make ex-ante assessments of the ongoing resilience of liquidity for particular instruments. This is discussed in more detail in Chapter 7.

6.13 One of the primary objectives of this charge should be to prevent the build up of leverage based on valuations that are uncertain or, at worst, implausible. Therefore it is important that the design of this charge is intended to dampen unrealisable profits in the upswing. There is a risk that any valuation uncertainty charge would be extremely pro-cyclical if regulators are unwilling to identify risks when market prices are freely available (even though robust liquidity might be absent) yet impose stringent requirements as valuations become more opaque and uncertain as market illiquidity becomes more obvious. A desire to avoid pro-cyclicality should be of primary importance when designing this charge.

Q3: Do you agree that valuation uncertainty should be dealt with via additional capital requirements? If not, what alternative approaches could be used?

Q4: In practice how can valuation uncertainty be consistently calculated?

Application of fair value

6.14 In Chapter 5 we highlighted some specific empirical examples where firms' practice led to aggressive and inconsistent application of fair value – for example, CVA against monoline counterparties and bid-offer adjustments. Further examples where the application of fair value can lead to a lack of prudence can be seen in the treatment of concentrated positions and the failure to recognise the future hedging costs associated with managing a derivative portfolio to maturity.

6.15 Our Dear CEO letter in 2008[69] highlighted our concern that the current high-level prudent valuation guidelines, described in Chapter 3, have not achieved this aim. We therefore propose clearer guidance to ensure the prudent application of fair value is undertaken in a consistent and transparent manner across jurisdictions. This could be achieved through accounting standards, but regulators should retain the ability to specify guidance to regulated firms, with adjustments to accounting valuations made where necessary.[70]

6.16 There is a degree of overlap between those positions for which specific valuation adjustments might be necessary and those positions that are subject to valuation uncertainty. Therefore, careful consideration should be given to ensure that there is no material overlap between adjustments made here and the capital charge for valuation uncertainty described above.

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69 In August 2008 we sent a 'Dear CEO' letter to CEOs/individuals responsible for apportioning and overseeing valuation controls concerning large and/or complex principal trading operations within banks and investment firms. In the letter we cited that firms' valuation processes and controls had become increasingly stretched and improvements were required in areas such as Product Control; Front office modeling approaches; valuation policies; and P&L attribution. Details of this letter are discussed in Box 8.1.

70 We note that the International Valuation Standards Council, in June 2010, released an exposure draft of a new International Valuation Standard on financial instruments. We see this as a useful first step towards consistent valuation guidance, however we believe much more specific guidance is required to achieve consistency.

6.17 This approach to prudent valuation continues to use the accounting valuation as the basis for valuations that feed into regulatory capital, albeit with more clearly defined measures to adjust for differences where necessary. This broad strategy will limit the extent to which we have powers to adjust valuations, and can mean that any regulatory actions against a particular firm to deal with systematic bias towards imprudent valuations will be opaque. An alternative to this would be to require a separate regulatory valuation, which would be used as the basis for capital resources and disclosed under Pillar 3. At this stage we do not think that the cost of this would be justified.

6.18 In either case, as discussed in Chapter 7, we think that the calibration of the prudent valuation requirements applied to a position should be directly linked to the liquidity horizon of a position (i.e. a position that is highly liquid and therefore has a short liquidity horizon, should have a valuation that reflects the value that could be achieved if the position was liquidated over that same time horizon).

Q5: Do you agree that detailed regulatory valuation rules be defined to ensure consistent standards in the application of fair value? If so, what areas would most benefit from such guidance?

Q6: Do you agree that a separate regulatory valuation model is not justified? If not, why not?

Inconsistency in valuation approaches

6.19 A significant inconsistency arises when firms take a different valuation approach (fair value or amortised cost) to similar assets. Our loss attribution data in Chapter 5 shows that this issue can be material, even for traded assets.

6.20 Recent changes to global accounting standards for valuation have reaffirmed that standards are unlikely to converge in the short term. The amendments currently under discussion continue to show significant areas of difference, especially between US GAAP and IFRS. For example, as discussed in Chapter 3, the proposed future US GAAP approach will extend the use of fair value to most financial assets with very limited exceptions, which might not be the case under IFRS 9.

6.21 The global nature of traded financial markets make it particularly important that the regulatory valuation framework for traded assets is consistent across borders, and we therefore propose international regulatory discussion on the principles under which positions should be held at amortised cost or fair value for regulatory purposes. Regulators should be able to require that the regulatory valuation approach (which feeds into capital resources) be consistent, based on principles agreed at an international level, even if this is not achieved in the accounting framework.

Q7: Do you agree that regulators should be able to adjust valuation approaches based on principles agreed at an international level? If not, how can regulators address the problem of significant differences in valuation approaches?

Q8: How should a set of rules that form the basis of a regulatory approach to valuation be constructed?

Q9: Do you believe the series of adjustments presented in this chapter would address the weaknesses identified during the crisis? If not, what other measures could be introduced?

Pro-cyclicality

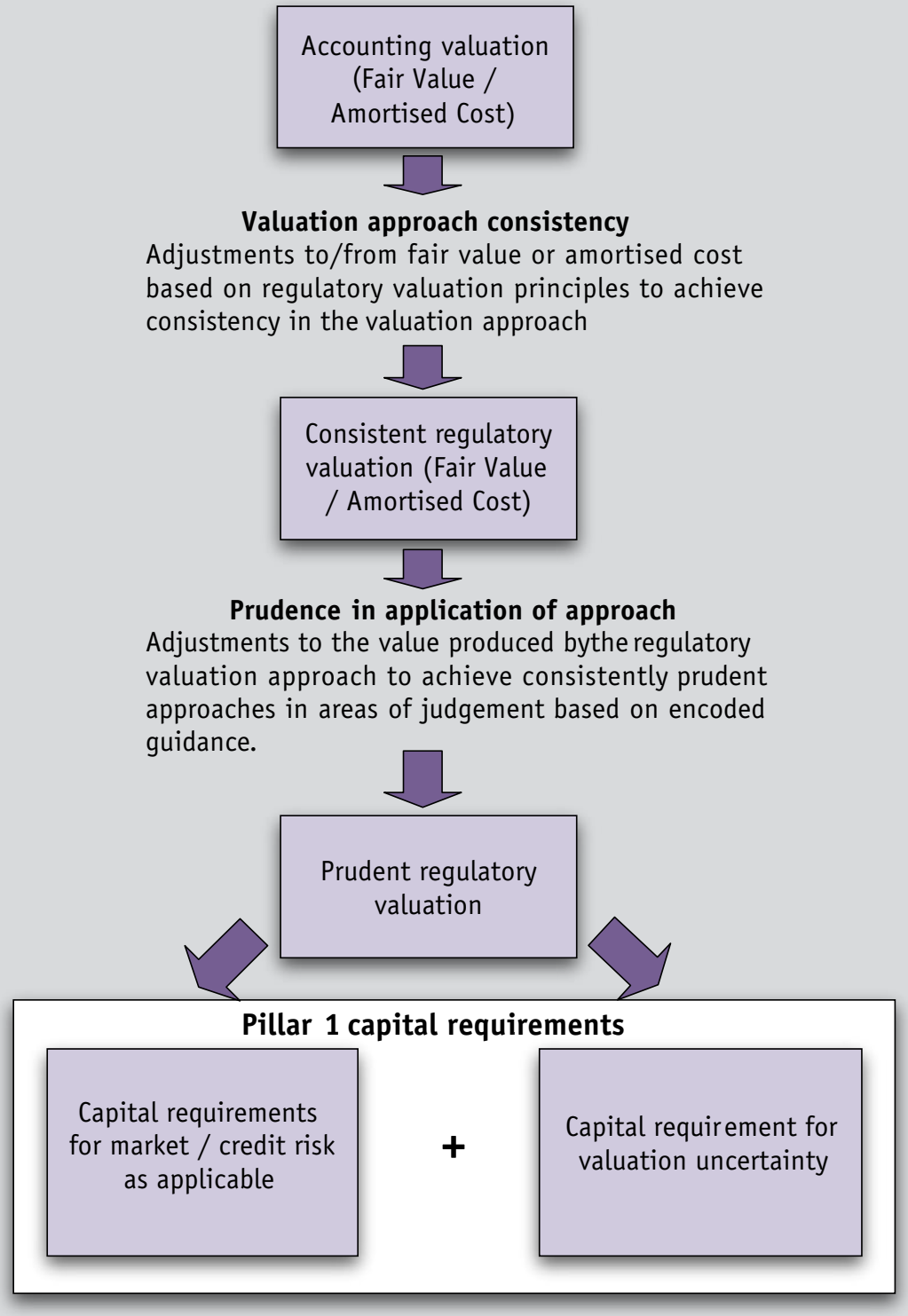
6.22 Chapter 5 also highlighted the overall pro-cyclicality of fair value, which has been widely commented on during the crisis. We believe that a carefully designed capital charge for valuation uncertainty, designed to target those valuations that are not realisable in times of stress, is a tool that could be used to deal with this potential pro-cyclicality.

6.23 The BCBS has mentioned its desire to continue the discussion on unrealised gains on fair value assets and CEBS has identified the recognition of day-one profits as an area of particular concern. We believe that both of these areas should be explicitly discussed as part of the fundamental review.

Q10: Do you agree that a carefully designed valuation uncertainty charge could help to mitigate the leverage enabled by reliance on exuberant market prices?

Q11: What other measures could be used to mitigate the pro-cyclicality of fair value?

Box 6.1: How would this valuation regime work in practice?



7 Coverage, coherence and the capital framework

Summary

7.1 This chapter gives our views on the appropriate responses to the issues raised about the coverage and coherence of the capital framework in Chapter 5B. We set these views out in 5 sections:

A. Is credit different? – In Chapter 4 we discussed data showing a difference in the structure of credit markets compared to other traded markets. Chapter 5 highlighted the significant losses on credit products in the financial crisis. Before considering the issues of modelling more generally in Chapter 8, this section considers whether traded credit positions should be treated differently to other traded positions.

B. Market liquidity risks – Chapter 5 identified that there are issues with the inclusion of illiquid instruments in the current regulatory trading book. This section considers how market liquidity risk can be better captured in the capital standard.

C. Interest rate risk on amortised cost positions – This section focuses on the coverage of the capital standard, it examines other market risks that need to be captured beyond the current scope of the trading book.

D. Credit Valuation Adjustments (CVA) – Chapters 3 and 5 highlighted that the risk posed by CVA volatility was a gap in the framework and noted the measures that are being introduced by the BCBS to address this. This section discusses the optimum long-term approach to capturing CVA volatility and proposes this is considered as part of the fundamental review.

E. Other issues associated with the existing regime – this final section discusses a number of other risks linked to traded assets that are not captured by the current regulatory framework:

a) contingent market risk;

b) gap risk; and

c) hedging risks.

Key recommendations			
No	**Key issue**	**Recommendation**	**Details**
4	The continued arbitrage between the banking book and trading book for default risk through market-implied measures of risk	**A consistent regulatory approach to credit assets**	Regulators should require a consistent approach to calculating capital requirements for credit default risk in positions, regardless of whether they are trading assets or not. A separate credit spread risk capital requirement should be applied in addition to credit default risk for fair valued assets. The capital/liquidity horizons of both charges could be varied.
5		**New methodologies to capture credit risk on fair valued assets**	A range of options are possible and may be applied based on a measure of complexity of the relevant products. **Option 1:** Allow credit risk to continue to be modelled, using a consistent approach for credit default risk, based on either an amended IRB approach or an IRC approach. The approach would incorporate regulatory set parameters to ensure an appropriate level of conservatism. **Option 2:** Restricted modelling only allowed for credit spread risk and for credit default risk only for the most liquid products, with more diversification benefit allowed within standardised rules for all other credit assets. **Option 3:** Consistent basic standard rules approach for all credit assets for both credit spread and credit default risks with limited diversification benefit.
6	The poor capture of market illiquidity as a risk (including the assumption of liquid hedging markets)	**Market liquidity risk forms part of the regulatory capital requirements**	A differentiated approach to market risk capital standards based on a measure of the liquidity resilience. This includes liquidity being factored in to any future trading book boundary. The calibration of the prudent valuation framework requirements and the market risk capital requirements should be linked by a consistent assessment of liquidity horizon.
7	A failure to capture spread risk on banking book positions subject to fair value	**Explore linking valuation and capital requirements**	A consistent approach to valuation could allow a consistent boundary for market risk, by requiring all positions held at fair value to have market risk capital – reflecting the reality that they are the set of positions that pose a risk to solvency of firms due to market movements.
8	The failure to capture in Pillar 1 the interest rate risk of banking book assets and liabilities subject to amortised cost	**Consideration of Pillar 1 capital charge for interest rate risks on amortised cost assets**	Consideration should be given to including IRRBB in the Pillar 1 framework. We will release a DP exploring the key issues in this area and outlining our framework for challenging firms' calculations of this risk by Q4 2010.

Key recommendations			
No	**Key issue**	**Recommendation**	**Details**
9	The failure to capture certain elements of counterparty credit risk – in particular CVAs	**A coherent approach to capturing CVA volatility risk**	The BCBS December 2009 proposal is an important first step in capturing CVA volatility risk – however, a longer-term approach is needed. A first step should be a consistent and coherent approach for calculating CVA adjustments. A longer-term capital framework can then be delivered – consideration should be given to incorporating the CVA capital requirements within a coherent market risk framework.
10	Insufficient capture of specific risk factors driving losses, including the additional risk in complex products	**Contingent market risk, gap risk and hedging risk captured in capital framework**	All three risks drove significant losses in the crisis and should now be explicitly captured in the regulatory framework. A number of approaches to achieve this may be possible, we believe stress testing must form at least part of the solution to ensure robust levels of capital for these risks even in benign periods.

A. Is credit different?

Introduction

7.2 This section builds on the discussion in Chapter 4 on the structural difference in credit markets compared to other markets. In particular, we consider whether it is desirable to have a separate trading book style approach to capital requirements for traded credit given the interaction and feedback loops between the banking system and the provision of credit in the real economy.

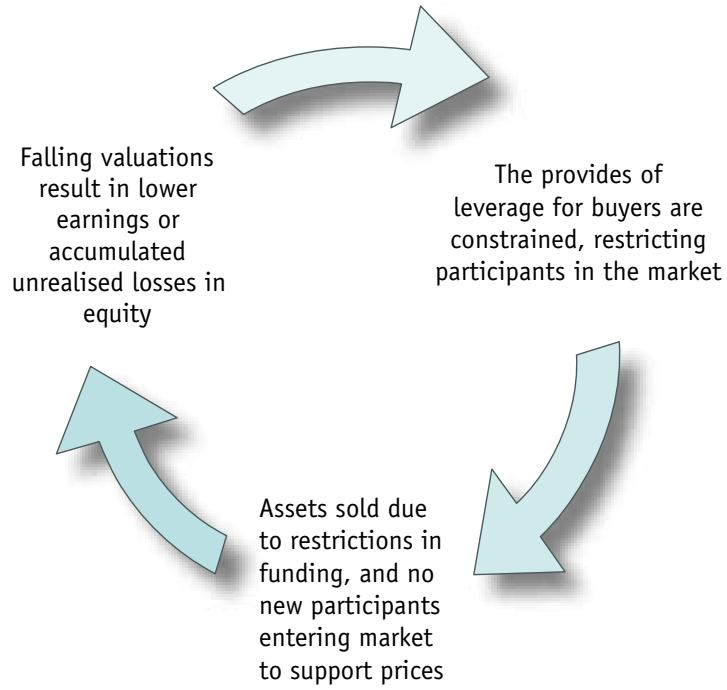
7.3 The refinements to the current regime made by the BCBS July 2009 trading book amendments package already partly recognises that traded credit is 'different' via the IRC. Despite the introduction of IRC, there remains a difference between the approach applied to calculate risk on credit positions in the trading book, and credit positions held in the banking book – in particular in the way hedging is allowed to be factored into the calculation of risk (discussed in Chapter 3).

7.4 Chapter 4 set out evidence of a structural difference in the credit markets, with the financial sector retaining significantly more credit risk than other markets, where financial institutions typically act as intermediaries.

7.5 If this difference in market structure is real, it reinforces the banking sector's aggregate sensitivity to credit product losses, irrespective of steps taken by individual banks to transfer risk to third parties. It therefore has implications for the design of a trading book regime that relies heavily on risk hedging and off-setting.

7.6 In addition, if most primary investors in the market are significantly leveraged (as banks are), this can further exacerbate asset bubbles in times when leverage is inexpensive, and cause self-reinforcing spirals of falling valuations and liquidity in stressed times (see Chart 7.1).

Chart 7.1



Implications for the design of the capital framework

7.7 One of the fundamental presumptions underlying the current trading book regime is that providing genuine incentives to hedge risk by reducing capital requirements is necessary, leaving the CCR framework to pick up the main ancillary risk associated with non-cleared derivative hedges. However, we believe it is important to challenge this presumption and, in particular, consider who the risk is being transferred to.

7.8 If the market structure dictates that hedging activity simply passes risk around the banking system, then the marginal benefit of providing incentives to hedge is significantly reduced. This means that the costs of overhauling the current trading book is much more likely to be worth paying for credit than for other asset classes and might lead to the conclusion that any type of separate trading book regime for credit positions is not appropriate.

7.9 At the start of this DP we set out an objective to improve the coherence and coverage of the capital regime for firms. Achieving this removes regulatory arbitrage opportunities and recognises that artificial boundaries in the regulations should not lead to similar assets having different capital requirements. We can consider the issue of credit default risk and credit spread risk separately.

Increasing consistency in the regulatory approach to default risk

7.10 The risk of default is driven by the same factors, irrespective of valuation approach or intent. For default risk, given the structure of the market, we believe there is merit in having a consistent approach across all credit positions. Within this construct, consideration could be given to differentiating positions by liquidity horizon. However, as our analysis of the credit market shows, any assumption that credit risk can be sold or fully hedged in times of stress might not hold in practice.

7.11 Achieving consistency would require us to also incorporate any off-setting between positions consistently. This would mean considering whether the IRB approach to credit risk mitigation needs to be enhanced, or whether the underlying assumptions are suitable for traded credit positions. Although the IRB approach does not deal with outright short positions, this should not be a problem, as short positions do not have credit default risk.

Q12: Do you agree that the structure of credit markets means that credit positions have a different risk profile to those in other markets? If not, why not?

Q13: Do you agree that a consistent approach to credit default risk should be applied across all positions? If not, why not?

Q14: Do you agree that a net position in a fair-valued credit product should have a higher capital requirement than a net position in an amortised cost position? What type of netting should be allowed for each position and should it be consistent across all positions?

Modelling default risk

7.12 Chapter 3 describes how the trading book regime allows banks' own models to describe relationships and benefit from market-implied hedging and offsetting. The banking book focuses on more limited off-setting of long and short positions only where strict criteria are met,[71] with underlying assumptions of risk capture and correlations being set by regulators.

7.13 The Basel July 2009 trading book amendments packages increase the capital standard for traded credit, but retain the broad trading-book approach to modelling relationships between fair-valued credit positions. For particular products – notably cash securitisation and re-securitisation positions – this approach has been removed, although the 'correlation trading carve-out' means that certain single-tranche synthetic CDO can still be modelled.[72]

71 The FSA's handbook refers to this as Credit Risk Mitigation.

72 The correlation trading carve out covers single-tranche synthetic CDO activities referencing corporate credit indices and baskets of corporate issuers.

7.14 As a result of the very complex nature of many credit products, modelling individual positions can be highly complex (and prone to uncertainty). Modelling the interaction between positions is even more difficult. The choice of modelling technique and the calibration procedures for models of complex products need significant estimation, and at the heart of hedging and offsetting assumptions is the estimation of unobservable parameters such as correlation.[73] The crisis has shown that firms' credit positions were much more highly correlated than firms or rating agencies had thought.

7.15 It is important that modelling frameworks applying to fair-valued credit risk instruments are capable of more accurately capturing this co-dependency. Firms should not assume that current modelling approaches (e.g. the single-factor Gaussian copula framework) will lead to sufficiently rigorous measures of credit risk in the trading book, where highly concentrated positions can develop. We believe that any future modelling of credit products should also consider a review of the modelling framework applied, to ensure it is an appropriate risk measure.

Alternatives to full modelling

7.16 Chapter 8 outlines recommendations for strengthening the overall prudential framework as it relates to risk management and modelling – many of these recommendations will also be relevant for modelling traded credit. In this section, however, given the difficulties in credit modelling, we consider alternatives to it for the purpose of calculating capital requirements.

7.17 An existing alternative would be to apply the banking book IRB approach to all credit positions. However, this might not be appropriate as the sole approach to credit in its current form because:

- it does not incorporate an approach for short positions;
- it is focused purely on default risk, with limited capture of migration, but doesn't incorporate an approach for other market risks; and
- it incorporates underlying assumptions of portfolio diversification, which may not be a sufficiently conservative for traded credit exposures.[74]

7.18 Ideally, we would want an alternative, simple approach. However, simplicity often suggests a lack of risk sensitivity for complex portfolios. This would not fit with the issues highlighted here concerning the spectrum of products included within 'traded credit', or regulators' desire for a risk-sensitive capital framework.

73 A good example of this process was the use of a copula function first applied to CDOs in David Li's paper *On Default Correlation: A Copula Function Approach* (2000), which has been seen as being flawed / misunderstood in the aftermath of the financial crisis.

74 The Advanced IRB approach applied in the banking book assumes a homogenous, highly diversified portfolio. The underlying model is based on a Gaussian copula which, in the context of internal models for the trading book discussed in Chapter 8, has also been shown to produce less conservative capital requirements than were observed in the crisis.

7.19 There may be approaches that can capture the middle ground between a fully modelled approach, allowing portfolio modelling, and a standardised additive approach. Given the different levels of complexity in credit products, the ability to model credit products could vary according to product type.

Option 1: Allow risk in credit positions to continue to be modelled

7.20 If firms were permitted to continue using internal models to calculate regulatory capital on traded credit products, we believe the uncertainty surrounding many underlying parameters means that regulators should consider placing a floor or cap on modelled assumptions. Consideration should also be given to stress-testing products as a means of setting floors on capital requirements for default risk.

7.21 This general approach could be applied for default risk, whether the model was based on the current banking book modelling approach (IRB) or the updated trading book approach (IRC). However, to achieve consistency across all positions, significant work would need to be conducted to determine what the appropriate consistent modelled approach should be.

7.22 For credit spread risk, stress testing might also inform parameters for risk modelling of fair-valued assets.

Option 2: Restrict modelling, but introduce diversification benefit in standard rules

7.23 If modelling were severely restricted, consideration could be given to applying a more flexible approach to the current standardised rules across the trading and banking books to allow more recognition of offsetting. This could be achieved through more flexible netting rules, which may allow netting across products that are broadly similar. Such an approach would need clear guidance on constructing portfolios of 'similar' assets to avoid recognition of inappropriate diversification.

Option 3: Consistent basic standard rules approach for all credit assets

7.24 The final option would be to apply a consistent set of standard rules to calculate credit risk on all credit assets. This approach would apply the same default risk approach across all assets, regardless of whether the asset was amortised cost or fair valued (and would therefore have a limited recognition of diversification), with a separate standard rules requirement for credit spread risk.

7.25 The most appropriate way forward may be to use different options for different products based on their risk characteristics and complexity. For the simplest products, a stricter approach to modelling, with regulatory set parameters, could be applied. As complexity increases, the latter options may be more appropriate. At its core, however, a new approach must be consistently applied for each credit asset class.

7.26 It will be necessary to examine these issues and the impacts of the various approaches further over the coming months as we progress with this review.

Q15: Do you agree that the three options presented are the main options available to capture credit risk? If not, what other approaches could be applied?

Q16: How could rules around netting in the restricted modelling approach for credit assets be applied in practice?

Q17: How could complexity be defined in a consistent way to tailor the approach to credit risk?

Spread risk

7.27 All other things being equal, credit positions that are fair valued have more sources of risk to the firms holding them than non-fair valued credit assets, as fluctuations in market prices and fundamental changes in default risk can affect their balance sheet value and directly affect solvency.

7.28 The system of valuation adjustments described in Chapter 6 would classify all positions via a consistently applied regulatory valuation approach of fair value or amortised cost. As risk is transmitted to the balance sheet via variations in value, we consider that a well-defined valuation approach could provide a better mechanism for aligning capital requirements to risk than the current trading book boundary based on trading intent.

7.29 Under the approach we describe, all regulatory fair-valued positions would be subject to a market risk capital charge. This differs from the current approach, which allows fair value positions to be subject to a banking book treatment that tends to ignore fluctuations in value caused by market factors and therefore does not capture spread risk in banking book credit positions – a key issue that we identified in Chapter 5.

7.30 Using the boundary created by valuation as the basis for determining positions requiring capital for market risk would allow regulators to define a consistent set of positions that are subject to market risk. This would deal with the market risk associated with fair-valued banking book positions that caused significant losses in the crisis.

7.31 We believe that such an arrangement would be a significant improvement on the current trading book boundary, in particular:

- it would ensure that capital requirements more closely reflect the risks of each specific instrument to firms' solvency;
- it would heighten the focus on instrument valuation and give more credibility to firms' regulatory balance sheets; and
- it would ensure consistency of application of market risk between firms, on the basis of the agreed consistent valuation approach, ensuring credit spread risk is captured in all positions where it is present.

7.32 In Chapter 9 we describe how this approach could operate in practice as part of a new framework, as well as alternative approaches to achieve our aim that market risk is captured consistently across the regulatory balance sheet.

Q18: Do you agree that whether a position is fair valued should determine whether it attracts a market risk capital charge? If not, what alternative approaches could be used to improve the boundary issue?

B. Market liquidity risks

Introduction

7.33 Traded positions are subject to a range of market, model, hedging, credit, counterparty credit and liquidity risks. Together these can be seen to comprise the traded product risks. Losses on trading activities have been caused by all these risks and it is often not possible to attribute the exact cause of a loss to any particular risk. The absence of consideration of liquidity risk represents a material gap in the current framework.

7.34 For the purpose of this DP, we have distinguished between:

- funding liquidity risk – this affects the liability side of the balance sheet through risks in areas such as overnight wholesale fund markets; and
- market liquidity risk – this primarily affects the asset side (and derivative liabilities) of the balance through sudden variations in asset market liquidity, which potentially leads to drastic price changes.

7.35 Funding liquidity risk crystallises where a firm with short-term funding may be forced to liquidate its positions in a shorter horizon than one with longer term funding sources. Funding liquidity risks have already been the subject of discussion and revised FSA policy through the new UK domestic liquidity regime[75] and the Basel December 2009 proposals.[76] As such, this DP focuses only market liquidity risk (subsequently referred to as liquidity risk).

Liquidity and the trading book boundary

7.36 As discussed in Chapter 3, the current trading book/banking book boundary effectively implies a binary approach to liquidity risk, based on trading intent. Historically, trading book positions were implicitly assumed to be liquid (as implied by the ten-day holding period assumption). This situation has changed, through the introduction of the Incremental Default Risk Charge (IDRC) and IRC requirements, which acknowledge that traded credit positions can be less liquid and require longer holding period or capital horizon assumptions. However, it is not just traded credit positions that are less liquid, similar problems have arisen in derivative books, where dealers have made large losses as a result of being unable to exit and/or effectively hedge positions.

75 PS09/16: Strengthening liquidity standards www.fsa.gov.uk/pages/Library/Policy/Policy/2009/09_16.shtml
76 International framework for liquidity risk measurement, standards and monitoring www.bis.org/publ/bcbs165.htm

7.37 The existing binary approach to liquidity fails to capture the fact that certain trading book items do not meet the ten-day liquidity horizon. That is, they could not be sold or fully hedged in a ten-day period (especially under stressed market conditions). A ten-day capital charge/loss assessment period is therefore not sufficient for these products.

7.38 Furthermore, liquidity tends to be highly cyclical. We observed extremely different levels of secondary market liquidity in a wide range of markets before and after the middle of 2007. As banks are most likely to face losses in stressed market conditions, a capital charge that implicitly requires a ten-day liquidity horizon under normal market conditions is not that meaningful.

7.39 An additional issue arises when firms estimate their risk using a short-term time horizon that can not be extrapolated on a linear basis. For instance, many firms estimate position correlations on a one-day basis and scale these up to a ten-day measure using the square root of time. This can materially underestimate position correlations, as they can vary drastically with a longer holding period.

7.40 As discussed a number of times in this DP, we do not think that a boundary based predominantly on trading intent is an appropriate way of determining capital requirements for an asset. While the concept of trading intent may describe a firm's desire to trade, it does not describe a firm's ability to trade. We believe that the market risk capital standards should be related to liquidity/trading feasibility in adverse market conditions.

Q19: Do you agree that there should be a differential approach to market risk capital standards based on an assessment of liquidity during adverse market conditions? If not, why not?

Linking liquidity and valuation

7.41 The accounting standards for fair value are associated with 'exit price' valuation. However, the accounting standards do not explicitly describe an 'exit horizon' that fair-value measures should be consistent with. In recent years, the accounting standards have sought to shed some light on the different liquidity characteristics of different segments of fair-valued positions. This has been done via schemes for grouping positions into different 'levels' based on whether a position is marked-to-market or marked-to-model, and in the case of marked-to-model positions, whether the input parameters for the model are observable.[77]

7.42 However, the absence of an explicit 'exit horizon' for the purposes of calibrating valuations has knock-on implications for the specification and calibration of market risk capital charges. Chapter 6 outlined considerations relating to the concept of prudent valuation, and suggested a link to liquidity. We think that there should be an explicit link between the liquidity horizon for market risk capital standards and the calibration of prudent valuation requirements.

77 These are often referred to as Level 1, Level 2 and Level 3 valuations as defined in IFRS 7 and FAS 157.

7.43 For example, if the liquidity horizon for a particular set of products is deemed to be three months (based on an assessment of baseline or stressed market liquidity) the prudent valuation requirements pertaining to those set of products should be consistent with a three-month close-out period (i.e. an estimate of the value that could be achieved over a three-month period, rather than a requirement to liquidate in a short period).

Q20: Do you agree that the calibrations of the prudent valuation requirements and the market risk capital requirements should be linked in a consistent manner? If not, why not?

Calculation and application of (il)liquidity considerations in a new framework

7.44 While we believe the case for including greater consideration of market liquidity risks within the capital framework is compelling, the method(s) by which this would be achieved are unclear and may be challenging to design and implement.

A measurement method

7.45 Regulators would need an ex-ante method to assess various different traded markets' liquidity. The highly cyclical nature of liquidity in traded asset markets and regulators' desire to measure the liquidity of markets in stressed, or downturn conditions, rather than conditions at the height of the economic cycle, create further problems.

7.46 A search for an ex-ante view of a market liquidity might begin by considering the following factors:

- **The degree to which the market participants are leveraged.** One would expect markets with a high proportion of highly-leveraged participants to be more volatile and suffer from a greater liquidity risk, than markets with a high proportion of unleveraged/low-leverage participants. In highly-leveraged markets, adverse price movements will lead market participants to suffer losses that are multiple times the movements, often leading to forced sales. This can lead to further losses, creating more forced sales. Ultimately, this may result in an unbalanced market with an absence of market liquidity.[78]
- **The homogeneity/heterogeneity of market participants.** In a homogeneous market, where all participants have similar investment horizons, similar funding structures and similar risk models, one would expect all participants to buy and sell assets at the same time following changes in the market. When something causes one participant to sell, all might sell, resulting in a self-fulfilling downward spiral. In more heterogeneous markets, one might expect different participants to enter the market when others are exiting, so the same spirals may be less likely to occur.

78 In the later section on contingent market risk, we note that leveraged market participants may be source of contingent market risk if they terminate trades, which are acting as hedges to dealers portfolios, when facing trading losses.

- **Complex securities.** It is likely that, in times of market stress, products with complex features may become less liquid as market participants have less certainty about their performance and value. However, simpler assets, whose value drivers are clear, would be likely to remain more liquid and may even see an increase in liquidity as trading migrates to these products.
- **The platforms on which a product is traded.** Finally, in times of market stress, one might expect exchange-traded markets, where liquidity can converge on a central platform, to remain more resiliently liquid than similar markets operating on a bilateral basis. For derivatives, this could be more pronounced where market participants are confident that the central counterparty is sufficiently well capitalised to withstand significant member defaults.

7.47 A starting point for a regulatory measure of market liquidity might be the Basel liquidity group's work, which decides which instruments should be considered liquid and which illiquid, for the Basel Liquidity Proposals.

7.48 Some academic literature[79] has suggested that regulators should consider market liquidity to comprise of search liquidity and structural liquidity. Search liquidity can be seen as the cost of finding a willing counterpart to transact with at any given time. Search liquidity costs may be extremely low in good times, but are likely to be much greater in times of stress. Structural liquidity can be seen as a measure of market participant heterogeneity because, as it increases, it increases the likelihood of market participation during high market stress. It has been suggested that there is a trade off between search and structural liquidity and that the higher the structural liquidity of a market, the more likely there is to be willing participants in downturn scenarios. Academics have tried to measure this structural liquidity.

The application of a charge

7.49 Assuming an agreeable ex-ante measure of stressed market/downturn liquidity was constructed, regulators would still need a method of applying (all other things being equal) higher capital charges to assets that exhibit lower stressed-market liquidity. This could perhaps be achieved through additional valuation uncertainty charges or via differently-calibrated market risk capital requirements.

7.50 **Valuation uncertainty approach.** In Chapter 6 we outlined our view that it is necessary for regulators to take account of the differences between what the accounting regime delivers in terms of asset valuations and what regulators want from asset valuations. As part of this, we suggested that regulators should introduce a number of amendments to accounting valuations to make them fit for 'regulatory' purpose. One such adjustment proposed was a regulatory charge for valuation uncertainty. The valuation uncertainty caused by downturn market liquidity could be factored into this charge.

79 A useful summary of these concepts and the related academic literature is included in the European Central Bank Occasional Paper No.50 *Implications for liquidity from innovation and transparency in the European corporate bond market*, August 2006.

7.51 **Differential capital standard approach.** One might consider bucketing assets according to their own or their hedges' downturn liquidity. Firms would then be required to apply different capital/liquidity horizons across different products, dependent on this regulatory measure of asset liquidity. The rationale for this would be that, all other things being equal, risk tends to increase with time and therefore a position that can be sold or hedged in a shorter time will have less risk than one that would take longer to sell/hedge. Adopting different liquidity horizons or capital horizons will materially increase the complexity of a models-based approach, given the difficulty of jointly modelling risk factors that are subject to different liquidity or capital horizons. This may make it difficult to incorporate 'diversification benefit' into the capital framework. That said, there is a question regarding the reliability and stability of modelled diversification benefits and excluding diversification benefits across risk factors subject to different liquidity/capital horizons would both simplify the modelling and introduce a potentially welcome element of prudence to the regime.

7.52 When applying any liquidity charge in trading activities, capital requirements would need to pay particular attention to two things:

a) We would need to ensure this liquidity factor did not create further pro-cyclicality in the regulatory capital requirements. The financial crisis has shown capital requirements to be cyclical in several areas and there are various international workstreams at BCBS operating to try and reduce this problem. We would need to ensure we did not introduce a further cyclical factor into the capital framework, therefore we would prefer a structural, rather than temporal view of the liquidity of asset markets.

b) We would need to ensure these requirements did not stifle innovation. At conception, all traded asset markets need to have a first trade. Regulators would need to ensure that valuable new asset markets would not be penalised to the extent that they could not develop.

Q21: How do you believe asset market liquidity should be measured?

Q22: How should regulators look to implement a liquidity market charge in a way that would not be pro-cyclical or stifle innovation?

C. Interest rate risks on amortised cost positions

7.53 The current trading book/banking book boundary defines which credit and equity positions are subject to capital charges for market risk. Positions held in the trading book are subject to fair-value requirements, with positions held in the banking book being subject to either fair value or amortised cost valuation, with most subject to amortised cost valuation.

7.54 Here we briefly discuss whether regulators need to assess the impact of movements in market factors on amortised cost-valued positions.

7.55 In the recent crisis the market began questioning its ability to assess the ongoing solvency of some firms from their published accounts. One reason for this was a concern that amortised cost valuation for certain assets no longer reflected the true value of these assets, as market prices of the same or similar assets were much lower due to credit risk concerns. Concerns over interest rate differentials between the asset and liability side of the balance sheet arose particularly at some smaller, less diversified firms for which net interest margin is the dominant driver of earnings.

7.56 The current Basel capital requirements framework recognises this 'Interest Rate Risk in the Banking Book' (IRRBB) as part of the Pillar 2 regime. In the UK, we have included IRRBB within our Pillar 2A capital requirements and therefore we view this as part of a firm's minimum capital requirements. While the rule book requirements in this area are not prescriptive, we believe that there are asset classes on balance sheets where IRRBB could justifiably be part of the Pillar 1 capital requirements.

7.57 As such, we have been undertaking a detailed programme of work to ensure we are in a position to provide sufficient challenge to firms' IRRBB calculations and ensure they are consistently capturing their risk in this area. In the interests of ensuring that the capital requirements framework is open and transparent wherever possible, we intend to publish a DP by Q4 2010 on our work. This DP will consider the case for including at least some elements of IRRBB in the Pillar 1 framework, and we shall also raise this issue in the relevant international fora. Where this could be achieved, the approach to interest rate risk could then form part of the consistent approach to credit risk described in Section A above.

Q23: Do you believe that IRRBB should form part of the Pillar 1 framework? If not, why not?

D. Credit valuation adjustments

7.58 CVAs have been closely linked to several issues during the crisis. It was a key driver of losses in the loss analysis discussed in Chapter 5, and was also at the core of a number of the valuation issues raised in that chapter.

7.59 As noted in Chapters 2 and 3, the BCBS has recognised that there was insufficient regulatory focus on this issue and will introduce capital requirements to capture the volatility in CVAs. The measure introduced was based on calculating the market risk on a hypothetical bond. However, we note two issues:

- a standard approach to calculating capital for CVA volatility is more meaningful if there is a standard approach to calculating CVAs on which it is based; and
- the approach to calculating capital for CVA is an interim measure and should be reviewed as part of our stated desired outcome of achieving a coherent overall capital framework for trading activities.

7.60 In Chapter 6 we set out our view that valuation methodologies should be more rigidly defined in the regulatory framework where regulators identify a lack of guidance to firms from accounting standards. CVA was one area explicitly identified. This key recommendation is intended to address the first of the above issues.

7.61 To address the second issue we set out several possible options for a longer-term, more coherent approach to calculating capital for CVA volatility. The impacts of each will need to be considered in the course of the fundamental review.

Option 1: Standard rules

7.62 It is possible to envisage a standard calculation that leverages off the market risk framework, similar to the bond equivalent approach. Equally, regulators could draw up standard percentages to be multiplied by the current CVA, designed to capture a worst-case change in credit spreads and/or exposure (mirroring the increased use of regulatory defined stresses discussed later in Chapter 8).

Option 2: Standalone VaR / IRC of CVA

7.63 Firms could leverage off their existing market risk models (such as VaR and IRC) to calculate a standalone charge for CVA by running their CVA measures through VaR and IRC (or successor) frameworks. Improved approaches to modelling and a greater emphasis on liquidity (discussed above and in Chapter 8 respectively) could also feed into this approach.

Option 3: Joint simulation of CVA with other market and credit risk factors

7.64 Regulators could allow CVA to be integrated into successor model frameworks on a marginal basis. This would be contingent on the future modelling frameworks demonstrating they are capable of conservatively accommodating the interaction of market and credit risk factors.

Q24: Do you agree that the three options represent the main alternatives in producing a long-term approach for CVA volatility? If not, what other alternatives could be considered?

E. Other issues associated with the existing framework

7.65 This section discusses a number of other omissions or issues with the current framework, which have been material loss drivers over the last three years. To ensure broad coverage of risks within the framework, we believe each of these should be addressed in the fundamental review.

Contingent market risk

7.66 One of the drivers behind the losses in our study described in Chapter 5 was contingent market risk. While there is no common definition of contingent market risk, we view it as the market risk created by the non-performance or loss of a single, or set of, hedge counterparty. It is best explained through examples.

7.67 **Example 1:** The default of Lehman Brothers left their market counterparties with significant unhedged risk. All these counterparties then tried to hedge their market risk, which led to some significant market moves. Smaller product markets, where Lehman's had a significant market share, such as inflation trading, were particularly affected. The process resulted in large losses for which there was not adequate regulatory capital.

7.68 **Example 2:** In recent years dealers have used hedge funds to hedge certain risks that they routinely take through their normal business, but do not want to hold. Equity correlation and dividend risk are two examples. However, if hedge funds start to incur losses on these, or other strategies, they may choose or effectively be forced to stop taking further risk and/or close out existing positions. Dealers' normal business activities will continue to add risk to their books – however, they will no longer be able to hedge these risks. This concentration in the type of institutions used to hedge certain risks has left firms exposed to a market risk should the availability of such hedges abruptly end. As hedge funds' performance tend to be quite correlated, it is plausible that a substantial number of hedges and hedging capacity could be removed from a market in times of stress, just as those hedges are needed. This is an example where contingent market risk crystallises without a counterparty defaulting.

7.69 Contingent market risk is present in any product that is hedged, and is therefore not restricted to complex products. It is likely, however, that more complex products that require hedging from an illiquid market will have higher contingent market risk. The counterparty credit risk framework captures some elements of contingent market risk as it relates to the risk of default of the counterparty to a hedge. Example 2, however, demonstrates that this risk is present even without a counterparty default – the regulatory framework fails to capture this.

7.70 There may be a variety of approaches that could be employed to capture this risk. As this risk is likely to crystallise only in stressed conditions, any approach to capture it in the capital framework should be structured to avoid underestimation of the risk in benign periods. We believe that contingent market risk may be best captured through the use of stress tests on portfolios, based on, for example, the loss that would be incurred if a number of the most significant counterparties to hedging positions exiting the market for those hedging products.

Q25: Do you agree that contingent market risk should be captured in the regulatory framework? If not, why not? If yes, how can it be captured – would stress tests be sufficient and if so how could they be applied consistently?

Gap risk

7.71 Gap risk occurs when a market move leads to a sudden gapping, or discontinuity in the price or value of a position. This discontinuity causes significant complexity in hedging the risk. As we noted in Chapter 3, the current VaR modelling framework does not capture the 'gap risk' inherent in certain trading positions, as this commonly arises for market moves beyond the required 99% confidence internal. Gap risk can arise on trades such as non-recourse financing transactions (often structured as repos, total return swaps, partially collateralised derivatives) or through guarantees offered on portfolio management products, such as Constant Proportion Portfolio Insurance (CPPI).

7.72 The primary risk mitigant in such deals is usually a deleveraging mechanism that enables the portfolio to be re-collateralised, or unwound, before the dealer experiences losses. During the crisis, many dealers had transactions referencing underlying securities/exposures whose values gapped (e.g. ABS and hedge fund investments) leading to material losses on these transactions. This gapping was often associated with the absence of secondary market liquidity and so the deleveraging mechanism/arrangements could not be enacted.

7.73 We do not believe that low confidence interval VaR-type measures are the appropriate way to capture gap risk as it is likely to occur only as an extreme event in any modelled scenario. Instead this risk is likely to be better captured by stress testing that can allow an understanding of the quantum of losses that could be suffered due to the risk. It is the capture of these types of risks that is one of the motivations for our recommendation in Chapter 8 of the increased use of stress testing in setting capital requirements.

Q26: Do you agree that capture of gap risk within the regulatory framework should be improved? Is stress testing the best approach to quantify the risk, if not how could this be done?

Hedging risk

7.74 The current ten-day VaR measure required by regulators assumes that positions are constant over the ten-day horizon, and therefore it does not capture the ongoing risks that a firm faces in dynamically managing its trading portfolio. It is a feature of all large dealers' derivative portfolios that the risks cannot be instantaneously closed out, but require ongoing dynamic hedging. The need for dynamic hedging has grown as the scale and complexity of firms' trading books has grown.

7.75 The complex links between financial variables mean that dynamic hedging of trading portfolios is not costless. The costs of ongoing hedging will tend to be a function of variables, such as realised volatilities and correlations, and in some instances may also be a function of the path or level of certain variables.

7.76 Periods of protracted volatility will lead to significant hedging costs being incurred by dealers. A function of VaR models' failure to capture this risk is that they are not able to discriminate between those firms that have portfolios with relatively low future hedging risk/costs and those with concentrated positions in exotic instruments that have future hedging risk/cost. We note that in any new measure to address CVA volatility risk it will be important to capture hedging costs, as CVA desks are an example of an area where these costs can be large.

7.77 The cost of hedging a position is also linked to its valuation, as these ongoing costs effectively reduce the realisable value of a position between a reporting date and its future sale or close-out. In our experience, firms do not hold sufficiently large valuation adjustments as a mitigant for expected future hedging costs.

7.78 The sizeable losses dealers have incurred hedging instruments, such as portfolio credit derivatives and exotic equity derivatives, demonstrate the materiality of this issue. The more prescriptive prudent valuation guidance recommended in Chapter 6 may be able to capture the expected costs of hedging and incorporate them within the position valuation. The additional ongoing risk posed by the variability in the cost of dynamically hedging, however, is an area that still needs to be captured in the capital framework.

Q27: It is clear that firms face significant hedging risk/costs that can be material loss drivers. How should this be captured in the regulatory framework? Should this be done through internal models being required to reflect the risks of a dynamic portfolio rather than using a constant risk assumption?

8 Risk management and modelling

Summary

8.1 In Chapter 1 we highlighted the need to review our reliance on using firm's own risk measures, particularly VaR models based on market implied measures of risk, in regulatory capital requirements. This chapter gives our views on the improvements we think are necessary in firms' general risk-management standards and specifically in risk modelling. We set these views out in two sections:

A. Risk management: each firm is responsible for managing the risk of its trading activities. This section discusses areas of risk management practice we think need to be improved and suggests a number of specific minimum standards.

B. Risk modelling: this section discusses the observed weaknesses in modelling standards, with a focus on the weaknesses to be addressed if internal models are to remain part of the regulatory capital framework.

Key recommendations			
No	**Key issue**	**Recommendation**	**Detail**
11	Incomplete regulatory oversight of trading risk management	**Extend risk management standards and delink them from model approval**	Regulators should directly oversee independent risk management functions and front office activities. Minimum defined standards should be required in these areas before firms can trade in a particular asset class.
12	Alternative measures of trading risks required to enhance the current internal models framework	**A full, coordinated, assessment of risk measurement approaches for trading activities**	A Basel level group should consider improved modelling approaches that could be applied to better capture the risk in traded products for capital purposes. Firms should also be required to hold capital against model risk and risk factors not incorporated in their models.
13		**Increased and better use of stress testing in the capital framework**	Regulators should complement model-based approaches with regulatory defined stress tests to set back-stops or additional capital compared to that generated by firms' internal models.

Key recommendations			
No	**Key issue**	**Recommendation**	**Detail**
14	Inconsistent standards for modelling across jurisdictions	**Improve international consistency in the application of risk modelling standards**	Regulators should improve coordination of model approval, possibly through a sufficiently expert cross-border group at the Basel Committee to supplement individual regulators' model approval processes, to ensure consistently high standards in internal models.
15	The significant difference between standard rules and internal models	**Ensure model removal is a credible threat**	Improved modelling standards, and a more coherent approach to standardised rules for capital, should produce a lower differential between capital set by internal models compared to standard rules. This should be used as the basis of a credible threat for removing model permission when firms fail to meet the required standards.

A. Risk management

Addressing the incomplete regulatory oversight of trading risk management

8.2 We identified significant weaknesses in firms' risk management practices during the crisis (see Box 8.1), and similar weaknesses were discussed as drivers of the losses analysed in Chapter 5. The issues showed how important it is that the regulatory framework allows sufficient action to be taken when control processes are not adequate, particularly around more complex products.

Box 8.1: Risk management concerns raised during the crisis

In August 2008 we sent a 'Dear CEO' letter[80] to CEOs/individuals responsible for apportioning and overseeing valuation controls concerning large and/or complex principal trading operations within banks and investment firms. In the letter we stated that firms' valuation processes and controls had become increasingly stretched:

'For a wide range of positions, valuation processes and controls, which were broadly effective and appropriate before the second half of 2007, are no longer adequate. Firms should proactively review and enhance their processes and controls to ensure that they are commensurate with the challenges and issues posed by the increased market illiquidity and valuation uncertainty.'

We believe the concerns in that letter continue to be relevant today and relate, not only the general issue of adequacy of processes and controls, but also incidents of mis-marking linked to the financial crisis, which exploited flaws or failures in processes and controls.

80 A copy of the letter can be found at www.fsa.gov.uk/pubs/ceo/valuation.pdf

The comments in that letter are relevant across asset classes, but have significant relevance for complex products:

- **Product control**: During the crisis we found that product control staff could not adequately perform this task due to lack of skills or seniority, or weaknesses in the review systems meant the process was overly manual.
- **Front-office modelling approaches**: We identified instances of weak system infrastructure for exotic/illiquid products that meant independent review of pricing was prone to failure. The weaknesses identified included opaque/weakly controlled calibration methods for complex products and inadequate controls over model usage.
- **Valuation policies**: We found inadequate valuation policies and procedures, including an absence of agreed valuation methods at a product-level and an absence of product-level pricing verification methodology.
- **Profit and Loss (P&L) attribution**: We found examples where gains on complex positions were not adequately analysed (e.g. a lack of sense-checking of results), and a lack of scrutiny and challenge in instances where no P&L impact was recorded in spite of information that the market was moving.

Extending risk management standards and delinking them from model approval

8.3 As outlined in Chapter 3, there are general risk-management standards defined for all trading book positions. However, more detailed risk-management standards are required when a firm applies to use an internal model for regulatory capital purposes. As such, firms generally need higher risk-management standards to obtain the lower capital requirements that models tend to deliver.

8.4 In line with our aim to reduce the capital differential between any internal model approach and standard rules, we do not believe these higher risk-management standards should be so explicitly linked to any model approval. Appropriate minimum risk-management standards need to be articulated and met by firms before permission to trade is granted. An example of why this is important was the lack of oversight of positions that were subject to standard rules capital requirements – even when those positions were complex instruments such as Collateralised Debt Obligations (CDOs) of Asset Backed Securities (ABS).

8.5 The assessment of standards for the purpose of modelling permission is currently done by asset class (e.g. FX, commodities, equities) and by product complexity. This differentiated approach could also be applied when considering firms' permission to trade in the first instance.

8.6 The existing standards place significant emphasis on independently overseeing the front office business through risk management and other control functions. These functions remain important, but we think that more direct emphasis on the responsibility and oversight of front office senior management and processes are also necessary. Independent control functions are less effective in operations where the culture of front office is to elude or evade those controls.

8.7 In particular, there are several areas of weaknesses across trading room valuation and risk control functions:

- front office oversight and control arrangements;
- valuation model validation policy and process;
- the measurement and management of valuation model risk after the application of model validation processes;
- new product approval policy and process;
- independent price verification policy, process and resulting actions;
- valuation adjustment policies and processes for the range of adjustments that firms typically make, particularly for mark-to-market inventory;
- independent market risk management policy and process; and
- independent counterparty risk management policy and process.

8.8 Boxes 8.2 and 8.3 set out some examples of the standards we would expect to see for a number of areas.

Box 8.2: Trading management standards

The following standards are examples that would show rigorous front-office responsibility for trading risk management and associated controls:

- formally documented trader oversight arrangements setting out how senior front-office staff exercise oversight and control over their trading operations, so that senior front-office staff are accountable for their trading staff's risk-taking activities – these arrangements should be subject to audit;
- trader mandates including products, underlyings, restrictions and risk limits;
- trader-level, or granular revenue, budgets;
- requirements for risk-adjusted performance measurement, with links to remuneration policy including differentiation relating to the differing quality of P&L/revenue (e.g. realised vs. unrealised, when unrealised P&L allowance for the risks to the eventual realisation of the P&L);
- articulation of intra-day risk appetite and controls over intra-day risk taking;
- formalisation of stop-loss disciplines (referrals and/or limits) over short and longer horizons;

- two weeks enforced continuous leave per annum with no phone/blackberry contact;
- 'cross-roughing' arrangements where one trader takes responsibility for another's book for a period of time;
- trader and supervisor P&L sign-off;
- trader and supervisor risk sign-off, including processes for front-office responsibility for accurate and comprehensive risk identification and stress analysis;
- a system to classify approved products/pay-offs, agree front-office valuation and mark methods and standards, where front-office responsible for marking;
- documentation of front-office (or desk support/middle-office roles) concerning trade life-cycle controls (resets, barrier monitoring, fixing, etc);
- documentation of business critical trader tools (e.g. spreadsheets used for marking, hedging and position management), which can be subject to audit; and
- documentation of front-office hedging strategies for complex and/or long-dated derivative portfolios.

Q28: Do you agree there should be greater oversight of risk management functions in firms, including front office activities? If so, are the standards set out in Box 8.2 and Box 8.3 the type of requirements regulators should expect to see? What tools could regulators use to achieve these outcomes?

Box 8.3 – Valuation model validation standards

The following standards are examples that would evidence high standards in model validation:

- model validation should consider the financial assumptions of a model in addition to the accuracy of the mathematics (given those assumptions) and coding;
- model review should consider the value of the product to the organisation and the method of realising that value (or neutralising the liability) – this would require firms to consider their ability to hedge the product, the cost of hedging the product over its life, and the residual risks after hedging;
- the model validation process should carefully validate pay-offs as well as models, and distinguish pay-off variations that give rise to additional valuation or risk management issues;
- firms should consider having a validation process that is more than simply binary (pass/fail) to help with ongoing model risk assessment;
- model validation should consider what other models are used in the market, though it should not be restricted to this if the validator sees weaknesses in all models;

- validation should perform analysis of the potential financial impact of the weaknesses of models;
- the validation process should consider the calibration risk in the model;
- validation of stability, and the minimum standards to achieve stability, where numerical methods are used for valuation and risk measures should be considered; and
- the model should be validated in its production environment and production issues should be factored into the approval/restrictions that follow from validation.

B. Risk modelling

Improving the use of internal models in the regulatory framework

8.9 Chapter 3 described several measures introduced to mitigate observed weaknesses in modelling traded assets for regulatory capital requirements, including the introduction of IRC and stressed VaR. The new measures will generally increase the capital standard and reduce the relative cyclicality of VaR, and also improve the capture of modelled credit risk and illiquidity in the trading book.

8.10 In addition to specific modelling requirements, VaR modelling standards have been improved to require firms to ensure all risk factors used in their pricing models are included in their VaR model (or, if not, the omission must be explained).

8.11 These amendments represent an important improvement to the regulatory approach for using internal models. However, they do not address all weaknesses we have identified, such as the inability of current VaR models to capture longer-term risks and the potentially inconsistent application of standards across jurisdictions. Nor do they address fundamental issues, such as:

- unduly relying on market-implied measures of risk;
- inconsistency and model-risk inherent in modelling complex products in illiquid markets; and
- the collective weakness for firms using a specified percentile VaR to appropriately capture the full range of tail risks, especially on non-linear products (e.g. gap risk – see Chapter 7).

8.12 Chapter 7 describes structural reasons why a different approach to modelling should potentially be taken for traded credit. In this section we assess whether these fundamental issues fatally undermine the use of internal models generally in the regulatory capital framework.

Should internal models play a role in the capital framework of the future?

8.13 Any model (whether used solely for risk-management purposes or in the capital framework) that attempts to describe the complex nature of the financial markets that currently exist, is likely to be complex itself. However, no matter how complex a model becomes, it can only represent a simplified view of the interactions that happen within a market. The standard rules calculations themselves can be seen as extremely simple 'models' of the world, which make implicit assumptions regarding the primary risk factor of each position and use standard methods to apply relevant shocks to those risk factors.

8.14 The relevant questions to answer for this DP are therefore linked more specifically to the incentives regarding firms' use of internal models for regulatory capital purposes, which is linked to the question of the 'use test' described in Box 8.4.

Box 8.4 – Use testing traded modelling

The 'use test', where elements of the internal approach used for regulatory capital purposes must also be used for day-to-day management purposes, is currently applied as part of the validation of internal models used for regulatory capital purposes.

In theory the use test should deliver two benefits. First, elements of regulatory models that are used by a business will be subject to more internal scrutiny than those that are only produced for regulatory purposes and so should be subject to more regular review. Second, the standards that models must meet if they are to gain regulatory permission are likely to be higher than those that would otherwise be applied internally, so the use test should lead to more robust risk measures.

This reliance on the use test could, however, also act as an impediment to effective regulation. What should be a requirement to ensure that the measures of risk firms use are consistent with regulatory objectives can also become a requirement that can impede good policies on the basis that the approaches would not be used internally by firms. This misses a fundamental reason for prudential regulation, that firms are likely to internally mis-price those risks that will cause system-wide externalities.

Furthermore, aligning internal risk measures with regulatory capital measures means there is an incentive for firms to underestimate risk – reported regulatory capital ratios will appear healthier as risk (as therefore required capital) is lower. Although this is an inherent problem with any system where return on equity is considered an important benchmark, this is exacerbated in cases when regulators have endorsed the risk measure for regulatory use.

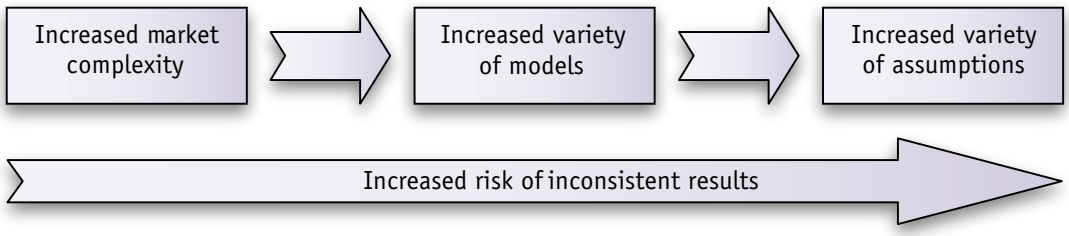
We therefore believe that regulators need to consider whether there is value in continuing to apply the use test. If it is to be applied we think it should be to ensure internal models for trading positions are brought in line with regulatory objectives, rather than to act as the primary deciding factor in which regulatory modelling approaches are chosen.

8.15 Whichever model, internal or otherwise, is chosen as the calculation methodology for regulatory capital, must capture the right risk factors in a way that meets regulatory objectives and gives investors confidence that risks are adequately covered by capital resources. As such, there is a fine balance to be drawn between:

- complex statistical techniques based on a multitude of assumptions, understood by only a few among regulators and firms, which will be aiming to achieve an 'accurate' answer with most efficient alignment of capital to risk; and
- more simple regulatory approaches that are probably crude and leave room for arbitrage, but focus on the risk factors that regulators deem to be important.

8.16 The rest of this section describes what measures might be used to mitigate the risks posed through the use of internal models in the regulatory framework.

Figure 8.1



Q29: Do you think that internal models should remain part of the regulatory capital framework? If not, what other ways could a risk-sensitive capital requirement be assessed?

Alternative measures of trading risks to enhance the current internal models framework

i) Coordinated work on improved modelling approaches to capture risk

8.17 As discussed in Chapter 3, we view the use of a low multiple of the ten-day 99% VaR as the primary driver of Pillar 1 market risk capital requirements as a failure in specifying the necessary measure of risk by regulators. Among other things, a ten-day 99% VaR calibrated to recent market history cannot adequately:

- measure loss potential in stressed or illiquid markets;
- capture tail risks – i.e. tell you the size of loss beyond the given capital standard; or
- capture issues such as a prolonged and damaging P&L drip due to periods of high volatility that can cause hedge slippage/gamma losses.

8.18 Resolving these issues will require improving the implementation of the current framework to ensure that it works as best it can and then longer term consideration of whether an overhaul to the modelling framework is required.

8.19 Firms are already required to capture all material risks for positions within the scope of their model approval. To improve implementation of the current framework, we have been working with firms in the UK to ensure that they have in place risk-management processes to regularly and systematically evaluate whether their VaR models capture all material risk factors. Where this is not the case, we have been requiring firms to hold capital buffers against missing or poorly captured risk factors. We believe this promotes and enhances proactive risk management, which is clearly desirable. We will continue to promote this more systematic approach to capturing what we currently refer to as Risks Not In VaR (RNIV). In addition, when the July 2009 BCBS package is introduced, firms will have to ensure that all risk factors used in their pricing models are also included in their VaR model. This may necessitate an extension of the RNIV framework.

8.20 To address the longer-term issues, regulators will need to undertake a full assessment of the available risk-capture techniques. Alternative approaches (e.g. expected shortfall[81] measures) or calibrations may provide a better approximation to the distribution of profits and losses of trading books than firms presently use, capturing the higher rate of occurrence of extreme loss events. We support ongoing work within the Basel Committee to assess alternative measures of risk.

Q30: Do you agree that improved modelling approaches should be developed to measure risk? If so, what alternative modelling approaches could be investigated?

ii) Simpler alternatives (revised standard rules)

8.21 Once regulators have determined the type of measure that better captures the relevant risks, ideally these measures would be translated into more simple and transparent approximations, with no **meaningful** loss of risk sensitivity. This could include an increased role for scenario matrix approaches (a form of stress testing), which features within the existing CAD1 framework, which was outlined in Chapter 3.

iii) Use of back-stops and stress testing in the capital framework

8.22 The financial crisis showed that market-based parameters can often be poor indicators of the level of actual risk, particularly for more complex products. Where this is evident, we see a role for cruder measures to act as back-stops to full modelling approaches. This has already been introduced as part of the July 2009 package, where the modelled charge for the correlation trading portfolio is subject to a floor based on a percentage of the standard rules requirement. In part, this floor ensures that, over time, capital standards are not eroded by more opaque measures of risk.

81 Expected Shortfall (also known as expected tail risk or conditional VaR) measures the expected loss that would be incurred once a confidence level is exceeded – it therefore captures how high losses could be in an extreme (or tail) event.

8.23 As part of this, complementing any internal models approach for complex products with a robust stress-testing framework (potentially incorporating the stressed VaR already included in the July 2009 package of measures, or regulatory defined stressed parameters) should be considered, with tangible implications for the results of the stress-tests – for example, in setting a minimum level of Pillar 1 capital.

8.24 As an example of how stress-testing can be incorporated within the regulatory framework, the Basel Committee (in its July 2009 revisions to the market risk framework) introduced supervisory-set stresses for the correlation trading portfolio, noting that supervisors might use the outputs of the stresses to require additional minimum capital. We believe we could go further, hard-wiring capital buffers across complex asset classes based on appropriately determined stresses where internal models are used as the primary regulatory capital calculator. A key advantage of this approach would be that it would ensure robust capital requirements in the case of new products where there is limited historical market data. We recognise there is a balance to be struck in such an approach, and it is important that the calibration of stresses acts as a complement to risk measures rather than dis-incentivising a comprehensive view of risks.

Q31: Do you agree that back-stops and stress testing should have a more significant role in setting capital requirements? If not, why not?

Improving the use of models

i) Addressing inconsistent standards for modelling across jurisdictions

8.25 Chapter 3 highlighted potential inconsistencies in approving and implementing internal models. This inconsistency tends to increase during periods of financial innovation (see figure 8.1).

8.26 Applying regulations consistently and transparently is important to ensure robust capital requirements and to remove regulatory arbitrage opportunities for globally active firms. We see the need for greater international coordination regarding the recognition of internal models.

8.27 This could, for example, be achieved through a technical expert group, set up by the BCBS, to supplement the approval processes of individual supervisors. It would not be necessary to make any approval conditional upon the support of other regulators, but explicit sharing of detailed firm-specific models would have a positive impact on the overall consistency and standard of regulatory scrutiny of internal models.

8.28 We draw a distinction here between delivering improved consistency in model oversight and requiring the same model to be used by all firms. While the first may, in some instances, naturally lead to the second, widespread use of the same model specification can lead to collective short-sightedness, whereby herding behaviour is implicitly encouraged through each internal model giving the same signals at the same time.

ii) Addressing the difference between standard rules and internal models limiting the options of regulators in times of stress

8.29 As discussed in Chapter 3, we see the need for a lower differential between the capital standard for a given activity when calculated based on a model, and the capital that would be required under standard rules for any firm that would have its model recognition taken away. Despite the 2009 BCBS amendments, we believe the differential will continue to be significant for many portfolios, in particular diverse equity and commodity portfolios, and the credit correlation portfolio.

8.30 Lowering this differential can be achieved by ensuring there is a greater conceptual link between a models-based requirement and a standard-rules requirement, combined with a more granular assessment of risk management described above. The combination of changes discussed in this DP would, we believe, produce this result through increased capital for model-based risks and a more coherent overall regulatory framework.

Q32: Do you agree that internal model approval should be supplemented at a Basel level to improve consistency? If not, why not, are there alternative options?

How would this new approach address the weaknesses seen in the crisis?

8.31 Together, we believe the above measures would allow regulators a much wider view of the standards of risk management within firms and ensure that, where we do allow firms' models to be used as part of the framework, they are robust and fit for purpose.

8.32 The ability to restrict trading in the most complex products to firms with adequate risk-management capabilities, and a less cyclical approach to calculating capital, would result in significantly reducing the systemic risk posed by rapid financial innovation and ensure firms are more robustly capitalised when they enter stressed periods.

Q33: Do you believe that the measures presented in this chapter would address the issues related to risk management and modelling identified during the crisis? If not, what other measures could be introduced?

9 A new framework in practice

Summary

9.1 This chapter brings together all our recommendations. We illustrate the potential results of this fundamental review by presenting four alternative paradigms, each being a stylised view of what a new framework could look like in practice. These paradigms are not fully formed policy proposals, and it would be possible to extract desirable features from any or all of the paradigms. However, we use these to illustrate the limitations of what can be achieved without changing the trading book / banking book structure, and describe some of the practical barriers to delivery, which may help prioritise the issues that deserve most attention from regulators. We then draw out the key policy questions that we will need to answer when making policy decisions. Table 9.1 summarises the key recommendations from previous chapters and Table 9.2 shows whether these recommendations could be adequately addressed under each paradigm.

Table 9.1 Key recommendations

No	Key issue	Recommendation	Detail
Valuation			
1	Poor capture of valuation uncertainty as a risk factor	**A Pillar 1 capital charge to capture valuation uncertainty**	Valuations always contain an element of uncertainty, particularly in times of stress. This uncertainty represents a risk to the solvency of firms, and the regulatory framework should require firms to hold capital against this risk.
2	A lack of agreed and prudent valuation approaches for areas such as bid-offer adjustments and CVA	**Robust guidelines to ensure firms adopt prudent valuations**	Differences between the level of prudence in the accounting approach to valuation and that required by regulators result in a need for detailed regulatory valuation guidance for specific areas, where methodological guidance is not given in accounting standards, or where the guidance given does not meet regulatory requirements. The prudential filters framework should also be within the scope of the fundamental review to ensure valuation adjustments remain consistent in their rigour across all positions.

No	Key issue	Recommendation	Detail
Valuation			
3	Inconsistency in valuation approach across jurisdictions between fair value and amortised cost	**A system of regulatory valuation adjustments to ensure a greater consistency in balance sheet valuation approaches**	Regulators and investors desire a level playing field in valuation approaches to ensure consistently reliable reported capital resources. This consistency is not evident in the current or anticipated accounting frameworks under US GAAP and IFRS. Valuation adjustments should be applied by regulators to set the valuation approach (fair value or amortised cost) to a consistent basis across jurisdictions based on a set of regulatory valuation principles.
Coverage, coherence and the capital framework			
4	The continued arbitrage between the banking book and trading book for default risk through market implied measures of risk	**A consistent regulatory approach to credit assets**	Regulators should require a consistent approach to calculating capital requirements for credit default risk in positions, regardless of whether they are trading assets or not. A separate credit spread risk capital requirement should be applied in addition to credit default risk for fair valued assets. The capital/liquidity horizons of both charges could be varied.
5		**New methodologies to capture credit risk on fair valued assets**	A range of options are possible and may be applied based on a measure of complexity of the relevant products. **Option 1:** Allow credit risk to continue to be modelled, using a consistent approach for credit default risk, based on either an amended IRB approach or an IRC approach. The approach would incorporate regulatory set parameters to ensure an appropriate level of conservatism. **Option 2:** Restricted modelling only allowed for credit spread risk and, for credit default risk, only for the most liquid products, with more diversification benefit allowed within standardised rules for all other credit assets. **Option 3:** Consistent basic standard rules approach for all credit assets for both credit spread and credit default risks, with limited diversification benefit.
6	The poor capture of market illiquidity as a risk (including the assumption of liquid hedging markets)	**Market liquidity risk forms part of the regulatory capital requirements**	A differentiated approach to market risk capital standards based on a measure of the liquidity resilience. This includes liquidity being factored in to any future trading book boundary. The calibration of the prudent valuation framework requirements and the market risk capital requirements should be linked by a consistent assessment of liquidity horizon.
7	A failure to capture spread risk on banking book positions subject to fair value	**Explore linking valuation and capital requirements**	A consistent approach to valuation could allow a consistent boundary for market risk, by requiring all positions held at fair value to have market risk capital – reflecting the reality that they are the set of positions that pose a risk to solvency of firms due to market movements.

No	Key issue	Recommendation	Detail
Coverage, coherence and the capital framework			
8	The failure to capture in Pillar 1 the interest rate risk of banking book positions, subject to amortised cost	**Consideration of Pillar 1 capital charge for interest rate risks on amortised cost assets**	Consideration should be given to including Interest Rate Risk in the Banking Book (IRRBB) in the Pillar 1 framework. We will publish a DP exploring the key issues in this area and outlining our framework for challenging firms' calculations of this risk by Q4 2010.
9	The failure to capture certain elements of counterparty credit risk – in particular CVAs	**A coherent approach to capturing CVA volatility risk**	The BCBS December 2009 proposal is an important first step in capturing CVA volatility risk – however, a longer-term approach is needed. A first step should be a consistent and coherent approach for calculating CVA adjustments. A longer-term capital framework can then be delivered – consideration should be given to incorporating the CVA capital requirements within a coherent market risk framework.
10	Insufficient capture of specific risk factors driving losses, including the additional risk in complex products	**Contingent market risk, gap risk and hedging risk captured in capital framework**	All three risks drove significant losses in the crisis and should now be explicitly captured in the regulatory framework. A number of approaches to achieve this may be possible, we believe stress testing must form at least part of the solution to ensure robust levels of capital for these risks, even in benign periods.
Risk management and modelling			
11	Incomplete regulatory oversight of trading risk management	**Extend risk management standards and delink them from model approval**	Regulators should directly oversee independent risk management functions and front office activities. Minimum defined standards should be required in these areas before firms can trade in a particular asset class.
12	Alternative measures of trading risks required to enhance the current internal models framework	**A full, coordinated, assessment of risk measurement approaches for trading activities**	A Basel level technical group should consider how to better capture the risk in traded products for capital purposes. Firms should also be required to hold capital against model risk and risk factors not incorporated in their models.
13		**Increased and better use of stress testing in the capital framework**	Regulators should complement model-based approaches with regulatory defined stress tests to set back-stops or additional capital compared to that generated by firms' internal models.

No	Key issue	Recommendation	Detail
Risk management and modelling			
14	Inconsistent modelling standards across jurisdictions	**Improve international consistency in the application of risk modelling standards**	Regulators should improve coordination of model approval, possibly through a sufficiently expert cross-border group at the Basel Committee to supplement individual regulators' model approval processes, to ensure consistently high standards in internal models.
15	The significant difference between standard rules and internal models	**Ensure model removal is a credible threat**	Improved modelling standards, and a more coherent approach to standardised rules for capital, should produce a lower difference capital requirements delivered by models and standard rules. This should be used as the basis of a credible threat for removing model permission when firms fail to meet the required standards.

Paradigm 1: Updated current approach

9.2 Under this paradigm, there would be no significant change to the structure of the current framework described in Chapter 3. Capital resources would be generated by taking accounting values and applying prudential adjustments; and capital requirements would be based on a banking book and a trading book. Incremental changes to the current capital charges (as enhanced by the July 2009 BCBS package) would be considered, where this could be incorporated into the current framework. This paradigm is described in detail in Annex 2.

Conceptual issues

9.3 Significant progress could be made under this paradigm and the majority of recommendations could be implemented in some fashion.

9.4 However, there are three areas of conceptual weakness that would not be addressed by continuing with the current framework:

- The structural arbitrage between banking and trading capital requirements would remain, as credit and equity assets would continue to be subject to different capital requirements. This could potentially be limited if stricter criteria were applied when determining whether positions could be subject to a trading book style charge.
- Fair-valued assets would continue to be present in the banking book, meaning that the full range of risk arising from mark-to-market volatility is not captured. This problem might even be exacerbated if strengthening the trading book boundary led to more illiquid but fair-value positions in the banking book.
- The framework would remain complex and opaque, with more scope for hidden arbitrages and uncertainty among investors. Marginal improvements to the coherence of the framework could be made through measures to integrate modelling approaches subject to appropriate safeguards.

Practical issues

9.5 This paradigm potentially presents the fewest practical issues to implement as changes required could be added to current rules to target specific areas of weakness.

Impact

9.6 The overall impact would be significantly dependent on calibration and design of any elements added to the current framework. Increased capital requirements could be targeted to impact the most complex and illiquid products, through valuation uncertainty charges and the use of regulatory defined stress tests.

9.7 A stricter boundary – for example, defined by 'trading feasibility' – could reduce incentives to trade in complex products, with a resulting increase in investment in more liquid, simple products. Cost benefit analysis therefore is required on the importance of the markets that would be targeted.

Paradigm 2: Uniform capital standards

9.8 Under this paradigm, there would be no 'trading book'. Capital resources would remain unchanged, but the scope of the capital requirements would be determined only by the risks inherent in each position, which would be insensitive to valuation methodology or management intent. This paradigm is described in detail in Annex 3.

Conceptual issues

9.9 This paradigm has the capacity to address all of the key issues and incorporate almost all of our recommendations. The framework would be designed to ensure that all risks are captured for all types of assets, in theory limiting arbitrage opportunities available to firms through the movement of risk between trading and banking books.

9.10 This paradigm addresses the issue of fair value assets in the banking book not being subject to a market risk charge, by applying a market risk charge to all positions rather than linking market risk capital to the valuation framework.

Practical issues

9.11 In addition to the practical issues of Paradigm 1, this paradigm would require a significant reappraisal of approaches to capital calculation across both the trading book and the banking book. One approach would be to apply the current banking book charges for default risk across all credit positions, and something akin to the current trading book framework (excluding IRC) to all positions to cover market risk.

Impact

9.12 This paradigm presents a material shift in the approach to capital requirements, and the majority of the impact would be on credit and equity positions. Any application of banking book requirements to traded positions could make a number of areas of trading less feasible or, in an extreme case, make certain markets uneconomic. Careful cost benefit analysis would need to be undertaken in line with the discussion in Chapter 7.

9.13 The application of market risk charges to traditional banking activity, which would tend to be illiquid (and therefore subject to a long liquidity horizon), could increase the cost of borrowings by retail and corporate customers.

9.14 As with Paradigm 1, the valuation uncertainty charge could be targeted to impact the most complex and illiquid products, which would affect the incentives for investment in those products.

Paradigm 3: Valuation-based approach

9.15 Under this paradigm, like paradigm 2, the regulatory framework is aligned with the risks posed by assets rather than setting a boundary between positions based on trading intent. However, under this paradigm, risk is affected by the approach taken to valuation in capital resources calculation, rather than necessarily the position itself. Positions for which the fair value feeds into capital resources contain market risk and are subject to a market risk framework (as was discussed in Chapter 7), while those for which the valuation is unaffected by market moves are not. This focus on valuation would be intended to recognise its relative importance, as shown in Box 3.1. This paradigm is discussed in detail in Annex 4.

Conceptual issues

9.16 The approach implements all of our key recommendations. The key difference between this approach and Paradigm 2 is the alignment of the trading book boundary and the valuation boundary to resolve one of the core issues from the crisis period and remove arbitrage opportunities in the capital framework.

Practical issues

9.17 The practical issues described for Paradigm 2 apply equally to Paradigm 3. However, this paradigm presents an additional practical issue, in that there would be a much stronger necessity for a globally consistent approach to valuation.

9.18 Achieving this consistency, which has not been achieved in the accounting framework, would clearly present practical difficulties, both in its definition and its consistency in practice.

Impact

9.19 With the exception of the impact of a market risk charge on retail and corporate credit, the impact to the financial sector described for Paradigm 2 would also be relevant under Paradigm 3. In addition, the emphasis on a consistent valuation approach globally would result in many firms having to perform significant additional work to calculate valuations of positions – causing further cost. This would be the case where regulatory valuation did not coincide with a firm's local accounting valuation approach.

9.20 Depending on the burden represented by this addition requirement, this could result in firms concentrating portfolios in jurisdictions where accounting valuation guidance matches regulatory valuation requirements.

Paradigm 4: Full fair value modelling approach

9.21 Unlike the other paradigms, Paradigm 4 would see a structural overhaul of both capital requirements and valuation methodology for all positions across the balance sheet. Regulators would remove any boundary by requiring a fair value assessment for all positions, which would feed directly into capital resources. In addition, firms would use an internal integrated risk model to capture the aggregated and diversified risks of the entire portfolio. This paradigm is described in detail in Annex 5.

Conceptual issues

9.22 Conceptually it would be possible to incorporate all of the recommendations in this paradigm. There would truly be no boundary, as all assets would be subject to the same framework, leading to a consistent treatment of all risks. In addition, a key advantage would be the level of coherence it achieves, with all positions treated in the same manner and all risks captured in the same framework.

9.23 However, the biggest conceptual problem with this approach is that it ignores one of the underlying rationales for prudential regulation: that firms driven by profit will not assess risk (and therefore allocate resources) in a way that minimises the effects of failure on wider society. This is one of the key lessons to learn from this review.

Practical issues

9.24 This framework, as with Paradigms 2 and 3, directly tailors capital requirements to the risks posed by assets – however, it relies on firms' ability to model all positions and how they interact. This is likely to prove extremely challenging for the largest firms and would not be possible for smaller institutions. The result is the most coherent of all of the paradigms, but with notable opacity.

9.25 This type of framework is unlikely to deliver real consistency across firms, or across jurisdictions.

9.26 Such a radical overhaul of the valuation framework, going significantly further than IFRS, would mean no audit oversight for many of the valuations used in capital resources.

Impact

9.27 Applying fair value to all assets would result in a potentially highly pro-cyclical structure for a regulatory balance sheet, and could therefore lead to much more volatile capital resources in stressed periods.

9.28 By allowing the use of a single model capturing all risks, firms would be incentivised to invest in a range of assets that (under modelled assumptions) present the most diverse portfolio.

Table 9.2 – New framework paradigms

			Paradigm			
No	**Key issue**	**Recommendation**	**1**	**2**	**3**	**4**
Valuation						
1	Poor capture of valuation uncertainty as a risk factor	Capital requirements for valuation uncertainty	✓	✓	✓	✓
2	A lack of agreed and prudent valuation approaches for areas such as bid-offer adjustments and CVA	Detailed valuation guidelines to ensure prudent valuations	✓	✓	✓	✓
3	Inconsistency in valuation approach across jurisdictions between fair value and amortised cost	Regulatory adjustments to the basis of valuation to increase global valuation consistency	✓	✓	✓	✓
Coverage, coherence and the capital framework						
4	The continued arbitrage between the banking book and	A consistent regulatory approach to credit assets	×	✓	✓	✓
5	trading book for default risk through market implied measures of risk	New methodologies to capture credit risk on fair-valued assets	✓	✓	✓	✓
6	The poor capture of market illiquidity as a risk (including the assumption of liquid hedging markets)	Market liquidity risk forms part of the regulatory capital requirements	✓	✓	✓	✓
7	A failure to capture market risk of banking book positions subject to fair value	Linking valuation and capital requirements	×	×	✓	✓
8	The failure to capture in Pillar 1 the market risk of banking book assets and liabilities subject to amortised cost	Consideration of Pillar 1 capital charge for market-based risks on amortised cost assets	✓	✓	✓	✓
9	The failure to capture certain elements of counterparty credit risk – in particular CVAs	A coherent approach to capturing CVA volatility risk	✓	✓	✓	✓
10	Insufficient capture of specific risk factors driving losses, including the additional risk inherent in complex products	Contingent market risk, gap risk and hedging risk captured in capital framework	✓	✓	✓	✓
Risk management and modelling						
11	Incomplete regulatory oversight of trading risk management	Extend risk management standards and delink them from model approval	✓	✓	✓	✓
12	Alternative measures of trading risks required to enhance the current internal models framework	A full, coordinated assessment of risk measurement approaches for trading activities	✓	✓	✓	✓
13		Increased and better use of stress testing in the capital framework	✓	✓	✓	✓
14	Inconsistent standards for modelling across jurisdictions	Improve international consistency in the application of risk modelling standards	✓	✓	✓	✓
15	The significant difference between standard rules and internal models limiting the options of regulators in times of stress	Ensure model removal is a credible threat	✓	✓	✓	✓

Conclusions and key questions

9.29 The four paradigms presented above all have the capacity to deal with the majority of the issues that we have raised in previous chapters.

9.30 We use Paradigm 1 to highlight that many of the recommendations we have made deal with areas that do not involve structural change to the trading book boundary. However, the real fundamental recommendations put forward in this paper, and those that we think are necessary for real changes in behaviour to make the system safer, will require structural changes to the prudential framework.

9.31 Paradigm 4 (full fair value plus modelling) would probably represent the most radical change, but potentially the most coherent result. It is the only paradigm that delivers a consistent approach to valuation and a chance for a fully coherent risk assessment through an integrated model. However, we also use this to highlight the first key question that we will need to answer in undertaking this review.

Key question 1: Are market implied measures of risk suitable for regulatory capital purposes, and are the alternatives any better?

9.32 The prevailing modelling techniques described in Chapter 8 continue to rely on market implied measures of risk. These measures have a revealed tendency to underestimate risk in the market upswing and overestimate risk in the downturn. In both Chapter 1 and Chapter 8 we proposed, for this reason, a shift away from this reliance on market implied measures of risk towards an approach that recognises risks that would crystallise in a downturn. While this new approach could be applied within Paradigm 4, at its core, the application of a single integrated model must inevitably require a significant reliance on market implied factors.

9.33 Consideration of Paradigm 4 also reinforces the practical and technical issues that will be encountered when delivering against the elements of the review that relate to improving risk-management systems and controls within firms. Ultimately, we see these as being complementary to (but not replacing) structural reforms in the capital framework.

9.34 We also use this paradigm to imagine the destabilising effect of having the entire banking system required to apply a potentially pro-cyclical fair value approach. While we accept that some would consider this to be a theoretically sound new framework, we do not see this as a realistic alternative, at least in the near term. An increased focus on valuation is necessary, but we consider the measures described in Chapter 6 to be sufficient to deal with valuation issues.

9.35 Paradigms 2 and 3 more closely represent the current thinking within the FSA. They are similar in that they introduce a more coherent approach whereby the framework identifies and responds to the risks posed by instruments. These are chosen to highlight the second key question, regarding the nature of the risk that should drive the regulatory capital system. The key difference between these paradigms is that paradigm 2 suggests that risk is determined by reference only to the position itself, whereas paradigm 3 suggests that risk is defined (or at least affected) by the valuation approach adopted by the firm in question.

Key question 2: Is risk inherent in a position or is it affected by valuation?

9.36 In theory, we would support a notion that risk is independent of valuation – however, in most cases the transmission mechanism for risks to solvency to crystallise is ultimately through a change in balance sheet value. A further consideration is that the importance in getting valuation right, as outlined in Chapters 3 and 5, might suggest that the increased scrutiny engendered by linking risk to valuations would provide the right long-term focus. An alternative view could be that the potential for inconsistent valuation approaches should not be exacerbated by using those inconsistent valuations as a basis for capital requirements.

9.37 In Chapter 7 we discussed approaches to measure the liquidity of a market that would be present in a stress event. A measure of market liquidity is key to understanding the value of, and the risks inherent in, assets. Liquidity has been shown to be highly cyclical, and the evidence from the financial crisis has been that a wide range of markets perceived to be resiliently liquid before the crisis became highly illiquid in times of stress. Across all paradigms, consideration must be given to our final key question of whether any asset class can truly demonstrate liquidity in times of stress.

Key question 3: Are there any positions for which market liquidity can truly be relied on to warrant a lower capital standard?

9.38 The concept of allowing lower capital requirements for positions in the trading book is predicated on the availability of liquid markets, in which risks can be hedged or sold in a short time. Where markets are truly resiliently liquid, we could support a notion that lower capital requirements could be set. Following the financial crisis, however, some may question whether any market is resiliently liquid – this could be argued most strongly in credit markets, given their structure described in Chapter 4 (this argument was at the heart of our discussion in Chapter 7A).

9.39 As outlined in the Overview, we are publishing this DP with the intention of stimulating debate among firms, regulators and other market participants. We believe that these proposals in the form of Paradigms 1 to 4 would bring significant economic benefits by improving financial stability and market confidence. We recognise that changes, such as increases in capital requirements and adjustments to risk management systems, are costly. The majority of policy proposals that arise as a result of this review will need to be discussed and agreed at an international level, and estimating costs and benefits of specific measures at later stages will be a crucial part of this fundamental review.

Q34: Do you agree with the key policy questions that will determine the appropriate course of action? If not, what other key questions need to be addressed?

Q35: Do you agree that these paradigms represent the spectrum of frameworks that could be developed to address the key issues identified in this DP? If not, what other ways could a framework be developed?

Q36: Which paradigm do you believe represents the most successful solution presented in the DP and why?

Q37: Do you agree that these proposals will bring economic benefits by improving financial stability and market confidence? Do you agree with our high-level impact analysis for each paradigm? If not, what other costs and benefits do you think each paradigm may have on the market and the economy?

Annex 1

The current framework in practice

1. The following table gives a detailed overview of the current framework in practice. The table describes, for each major asset class, the related current regulatory capital framework[1] (focusing on the use of internal models). Each asset type is split according to the key features that determine its regulatory treatment, and that regulatory treatment is then described. For each asset type the table sets out:

   a) **Valuation approach:** The current framework is not always directly linked to the accounting valuation methodology applied to an asset. It is, however, a key feature, and all assets must be fair valued in the trading book. The table first divides each asset class by the valuation approach applied.

   b) **Risk:** Each asset presents different risks to a firm's solvency, and each risk is treated differently within the current framework. Assets are split into the risks they present.

   c) **Regulatory book:** Following (a) and (b), the assets are sub-divided by their position relative to the trading book/banking book boundary.

   d) **Capital standard:** The regulatory approach that underpins the calculation of the capital requirement.

   e) **Netting/Diversification/Correlation:** How diversification benefit can be incorporated when calculating capital requirements in the current framework.

   f) **Liquidity horizon:** The assumed liquidity horizon that forms the basis of the capital requirement.

   g) **Other assumptions:** Any other key assumptions that drive capital in the current framework.

1 The current framework described includes the impact of the market risk amendments in the Basel July 2009 package of measures discussed in Chapter 3.

Current approach

Positions	Valuation approach	Risk	Reg Book	Capital standard	Netting / Diversification / Correlation	Liquidity horizon	Other assumptions
Interest rate positions	Amortised cost	Interest margin	Banking book	Pillar 2	No diversification with other risks	n/a	n/a
	Fair Value	IRR					
		IRR	Trading book	Stressed VaR	Market implied off-sets and correlations Diversifications with other market risks	Ten-day	n/a
Positions on single name credit	Amortised cost	Default and migration	Banking book	IRB	Credit risk mitigation on position by position basis No charge for short positions IRB specified correlations for PD No diversification within credit or with other risks	Amount drawn down under existing facilities if default within one year	Downturn Loss Given Default (LGD) Maturity between one and five year collar
	Fair value		Trading book	IRC (99.9% one year)	Market implied off-sets and correlations Charge for short positions No diversification with other risks	Three months Assumption of 'Constant risk'	Avoid double count with VaR
	Fair value	Spread risk	Banking book	None	Can be used as credit risk mitigation	n/a	
			Trading book	Stressed VaR	Market implied off-sets and correlations Full diversifications with other market risks	Ten-day	
Counterparty Credit positions arising from OTC derivatives	Credit held at amortised cost*	Default and migration	Banking book	IRB	Credit risk mitigation on position by position basis No charge for short positions IRB specified correlations for probability of default (PD) No diversification within Credit or with other risks	Exposure at Default (EAD) based on expected positive exposure over one year horizon	Downturn LGD Maturity between one and five year collar
	Fair value		Trading book				
	Credit held at amortised cost*	Spread risk	Banking book	No charge currently**	n/a	n/a	n/a
	Fair value		Trading book				
Correlation trading positions	Fair value	All price risks	Trading book	99.9% one year	Applies to both long and short positions Market implied off-sets and correlations, including between tranches and underlying positions No diversification with other risks	Three-month liquidity horizon Assumption of 'constant risk'	Floor based on simple risk weights
Other securitisation positions	Amortised cost	Default	Banking book	IRB	No charge for short positions Credit risk mitigation on a position by position basis Some offset between tranches and underlying positions	Constant positions over one year	
	Fair value						
	Fair value	Spread risk	Banking book	None	n/a	n/a	n/a
		Spread risk	Trading book	IRB +	Application of banking book charges in the trading book Applies to both long and short positions No off-set between tranches and underlying positions Off-set permitted on a position by position basis	Constant positions	
		Default					

Current approach							
Positions	**Valuation approach**	**Risk**	**Reg Book**	**Capital standard**	**Netting / Diversification / Correlation**	**Liquidity horizon**	**Other assumptions**
Equity positions	Amortised cost	'Default' and migration	Banking book	IRB	Short positions that are not designated hedges treated as long positions IRB specified correlations for PD No diversification with other risks Lower LGD for diversified exposures Credit risk mitigation on a position by position basis	Constant positions	Fixed LGDs Five-year maturity Floors based on simple risk weights
	Fair value	Specific equity risk	Banking book	99% three-month VaR	No diversification with other risks	Constant positions	Floors based on simple risk weights
			Trading book	Stressed VaR	Applies to both long and short positions Market implied off-sets and correlations Full diversification with other market risks	Ten day	
		General equity risk	Banking book	Either included in IRB or 99% three-month VaR	No diversification with other risks	Constant positions	Floors based on simple risk weights
			Trading book	Stressed VaR	Applies to both long and short positions Market implied off-sets and correlations Full diversification with other market risks	Ten day	
Commodity positions	Fair value	Commodity risk	Banking book	Stressed VaR	Market implied off-sets and correlations Full diversification with other trading book risks	Ten day	
			Trading book				
Foreign currency positions	'Fair value' for FX	FX risk	Banking book	Stressed VaR	Market implied off-sets and correlations Full diversification with other trading book risks	Ten day	
			Trading book				

*The OTC derivative may itself be held at fair value, but the price of credit is calculated using a non-mark to market impairment-type model

**December 2009 BCBS contains a proposal to introduce a charge for CCR spread risk

Annex 2

A new framework – Paradigm 1: Updated current approach

1. A new framework, based on a series of updates to the current approach to trading activities, could allow several key issues set out in this DP to be addressed without significantly changing the structure of the framework.

2. The following table indicates how such a framework could look in practice, showing where the rules of the new framework would change versus the current framework. The key changes are highlighted in bold and are as follows:

   - all fair-value positions receive a capital charge based on their level of valuation uncertainty;
   - interest rate risk in the banking book is captured via a Pillar 1 capital charge;
   - positions in single name credit, equity, commodity and FX that are fair valued have capital requirements back-stopped by regulatory set parameters (e.g. correlation) or stress tests;
   - new CVA capital charge is introduced as part of the market risk framework;
   - no diversification benefit is allowed between equity, FX, credit and commodity positions; and
   - capital horizons used as a basis for capital requirements are differentiated by product type.

Paradigm 1 – Update current approach

Positions	Valuation approach	Risk	Reg Book	Capital standard	Netting / Diversification / Correlation	Liquidity horizon	Other assumptions
Fair value positions	**Fair value**	**Valuation uncertainty**	**Either**	**TBC**	**TBC**	**TBC**	**TBC**
Interest rate positions	Amortised cost	Interest margin	Banking book	**Pillar 1**	No diversification with other risks	N/A	
	Fair value	IRR					
		IRR	Trading book	Stressed VaR	Market implied off-sets and correlations Diversifications with other market risks	**Differentiated by product**	
Positions on single name credit	Amortised cost	Default and migration	Banking book	IRB	Credit risk mitigation on position by position basis No charge for short positions IRB specified correlations for PD No diversification within credit or with other risks	Amount drawn down under existing facilities if default within one year	Downturn LGD Maturity between one and five-year collar
	Fair value	Spread risk	Banking book	None	Can be used as credit risk mitigation	N/A	N/A
			Trading book	Stressed VaR	Market implied off-sets, **Regulatory correlations** **No** diversifications with other market risks	Ten-day	**Floors based on simple stress**
		Default and migration	Trading book	IRC (99.9% one year)	Market implied off-sets, **Regulatory correlations** Charge for short positions No diversification with other risks	**Differentiated by product**	Avoid double count with VaR
Counterparty credit positions arising from OTC derivatives	Credit held at amortised cost*	Default and migration	Banking book	IRB	Credit Rrsk mitigation on position by position basis No charge for short positions IRB specified correlations for PD No diversification within credit or with other risks	EAD based on Expected positive exposure over one-year horizon	Downturn LGD Maturity between one and five-year collar
	Fair value		Trading book				
	Credit held at amortised cost*	Spread risk	Banking book	**New charge for spread risk**	**No diversification with other risks**	**One year**	
	Fair value		Trading book				
Correlation trading positions	Fair value	All price risks	Trading book	99.9% one year	Applies to both long and short positions Market implied off-sets and correlations, including between tranches and underlying positions No diversification with other risks	Three-month liquidity horizon Assumption of 'constant risk'	**Floor based on simple risk weights/stress**
Other securitisation positions	Amortised cost	Default	Banking book	IRB	No charge for short positions Credit Risk Mitigation on a position by position basis Some offset between tranches and underlying positions	Constant positions over one year	
	Fair value						
		Spread risk	Banking book	None	N/A	N/A	N/A
		Spread risk	Trading book	IRB +	Application of banking book charges in the trading book Applies to both long and short positions No off-set between tranches and underlying positions Off-set permitted on a position by position basis	Constant positions	
		Default					

Paradigm 1 – Update current approach							
Positions	**Valuation approach**	**Risk**	**Reg Book**	**Capital standard**	**Netting / Diversification / Correlation**	**Liquidity horizon**	**Other assumptions**
Equity positions	Amortised cost	'Default' and migration	Banking book	IRB	Short positions that are not designated hedges treated as long positions IRB specified correlations for PD No diversification with other risks Lower LGD for diversified exposures Credit risk mitigation on a position by position basis	Constant positions	Fixed LGDs Five-year maturity Floors based on simple risk weights
	Fair value	Specific equity risk	Banking book	99% three-month VaR	No diversification with other risks	Constant positions	Floors based on simple stress
			Trading book	Stressed VaR	Applies to both long and short positions Market implied off-sets, regulatory correlations No diversification with other market risks	Differentiated by product	**Floors based on simple stress**
		General equity risk	Banking book	Either included in IRB or 99% three-month VaR	No diversification with other risks	Constant positions	Floors based on simple stress
			Trading book	Stressed VaR	Applies to both long and short positions Market implied off-sets, **regulatory correlations** **No diversification with other market risks**	**Differentiated by product**	**Floors based on simple stress**
Commodity positions	Fair value	Commodity risk	Banking book Trading book	Stressed VaR	Market implied off-sets, **regulatory correlations** **No diversification with other trading book risks**	**Differentiated by product**	**Floors based on simple stress**
Foreign currency positions	'Fair value' for FX	FX risk	Banking book Trading book	Stressed VaR	Market implied off-sets, **regulatory correlations** **No diversification with other trading book risks**	**Differentiated by product**	**Floors based on simple stress**
*The OTC derivative may itself be held at fair value, but the price of credit is calculated using a non-mark to market impairment-type model							

Annex 3

A new framework – Paradigm 2: Uniform capital standards

1. One potential new framework could have at its core the risks present in each asset class. This can address the majority of issues raised in this DP and achieve a coherent framework that applies to positions regardless of their position in a banking book or trading book structure (as such, the banking book/trading book boundary becomes irrelevant).

2. The following table indicates how such a framework could look in practice, showing where the rules of the new framework would change versus the current framework. The key changes are highlighted in bold and are as follows:

   - all fair-value positions receive a capital charge based on their level of valuation uncertainty;
   - capital requirements are not differentiated based on valuation methodology or position relative to the trading book boundary;
   - default risk of credit positions is captured by an adapted IRB model, with spread risk based on stressed VaR;
   - equity, FX and commodity risks all captured via stressed VaR models with regulatory based parameters;
   - no diversification is allowed between risks; and,
   - capital horizons used as a basis for capital requirements are differentiated by product type.

Paradigm 2: Uniform capital standards							
Positions	**Valuation approach**	**Risk**	**Reg Book**	**Capital standard**	**Netting / Diversification / Correlation**	**Liquidity horizon**	**Other assumptions**
Fair value positions	**Fair value**	**Valuation uncertainty**	**N/A**	**TBC**	**TBC**	**tbc**	**tbc**
Interest rate positions	Amortised cost Fair value	IRR	N/A	**Stressed VaR**	**Market implied off-sets and correlations** **Diversifications with other market risks**	**Differentiated by product**	
Positions on single name credit, including those arising from OTC derivatives	Credit held at amortised cost Fair value	Default and migration	N/A	**IRB**	Credit risk mitigation permitted on position by position basis No charge for short positions IRB specified correlations/market implied correlations No diversification with other risks	Amount drawn down under existing facilities if default within 1 year	Downturn LGD Maturity between 1 and 5 year collar
	Credit held at amortised cost Fair value	Spread risk	N/A	**Stressed VaR**	**Market implied off-sets and correlations** **Diversifications with other market risks** Charge for short positions	**Differentiated by product** **EAD on derivatives**	
Securitisation positions	Amortised cost Fair value	Default	N/A	IRB	Credit risk mitigation permitted on position by position basis Some offset between tranches and underlying positions No charge for short positions	Constant positions over one year	
	Amortised cost Fair value	Spread risk	N/A	**Stressed VaR/ new charge**	Different to default risk **Applies to both long and short positions** **No off-set between tranches and underlying positions** Off-set permitted on a position by position basis	Constant positions over one year	
Equity positions	Amortised cost Fair value	Specific equity risk	N/A	**Stressed VaR**	Applies to both long and short positions **Market implied off-sets and correlations** **No diversification with other market risks**	**Differentiated by product**	
	Amortised cost Fair value	General equity Risk	N/A	**Stressed VaR**	Applies to both long and short positions **Market implied off-sets and correlations** **No diversification with other market risks**	**Differentiated by product**	
Commodity positions	Fair value	Commodity risk	N/A	Stressed VaR	Market implied off-sets and correlations **No diversification with other trading book risks**	**Differentiated by product**	
Foreign currency positions	'Fair value' for FX	FX risk	N/A	Stressed VaR	Market implied off-sets and correlations **No diversification with other trading book risks**	**Differentiated by product**	

A new framework - Paradigm 3: Valuation-based approach

1. A framework focused on the link between valuation and the risks that are posed by assets to a firm's solvency would achieve a coherent framework that negates the need for a trading book boundary, simplifying the overall framework structure.

2. The following table indicates how such a framework could look in practice, showing where the rules of the new framework would change versus the current framework. The key changes are highlighted in bold and are as follows:

   - all fair-value positions receive a capital charge based on their level of valuation uncertainty;
   - capital requirements are based on valuation methodology, with fair valued positions receiving a market risk capital charge;
   - default risk of credit positions is captured by an adapted IRB model, with spread risk based on stressed VaR (only applicable to fair valued positions);
   - equity, FX and Commodity risks all captured via stressed VaR models with regulatory based parameters;
   - full diversification is allowed between risks; and
   - capital horizons used as a basis for capital requirements are differentiated by product type.

Paradigm 3: Valuation-based approach							
Positions	**Valuation approach**	**Risk**	**Reg Book**	**Capital standard**	**Netting / Diversification / Correlation**	**Liquidity horizon**	**Other assumptions**
Fair value positions	**Fair value**	**Valuation uncertainty**		**TBC**	**TBC**	**TBC**	**TBC**
Interest rate positions	Amortised cost	Interest margin	N/A	**Pillar 1**	No diversification with other risks	n/a	
	Fair value	IRR	N/A	**Stressed VaR**	Market implied off-sets and correlations Diversifications with other market risks	**Differentiated by product**	
Positions on single name credit, including those arising from OTC derivatives	Amortised cost	Default and migration	N/A	**IRB or IRC**	Credit risk mitigation permitted on position by position basis **No charge for short positions** IRB specified correlations	Constant positions over one year N/A	Downturn LGD EAD to cover future draw-downs during 1 year
	Fair value						
	Fair value	Spread risk	N/A	**Stressed VaR**	**Market implied off-sets and correlations** **Diversifications with other market risks** Charge for short positions	**Differentiated by product**	Avoid double count with VaR
Securitisation positions	Amortised cost	Default	N/A	IRB	Credit risk mitigation permitted on position by position basis Some offset between tranches and underlying positions No charge for short positions	Constant positions over one year	
	Fair value						
	Fair value	Spread risk	N/A	**Stressed VaR/ new charge**	Different to default risk **Applies to both long and short positions** **No off-set between tranches and underlying positions** Off-set permitted on a position by position basis	Constant positions over one year	
Equity positions	Amortised cost	Default	N/A	**IRB**	No charge for short positions IRB specified correlations No diversification with other risks	Constant positions over one year	
	Fair value	Specific equity risk	N/A	**Stressed VaR**	Applies to both long and short positions **Market implied off-sets and correlations** **Full diversification with other market risks**	**Differentiated by product**	
		General equity risk	N/A	**Stressed VaR**	Applies to both long and short positions **Market implied off-sets and correlations** **Full diversification with other market risks**	**Differentiated by product**	
Commodity positions	Fair value	Commodity risk	N/A	Stressed VaR	**Market implied off-sets and correlations** **Full diversification with other trading book risks**	**Differentiated by product**	
Foreign currency positions	Fair value for FX	FX risk	N/A	Stressed VaR	**Market implied off-sets and correlations** **Full diversification with other trading book risks**	**Differentiated by product**	

Annex 5

A new framework – Paradigm 4: Full fair-value modelling approach

1. A fully fair-valued balance sheet is an alternative approach that would require fully consistent valuation requirements across jurisdictions, but it involves developing a fully integrated model to capture the risks and diversifications across asset classes.

2. The following table indicates how such a framework could look in practice, showing where the rules of the new framework would change versus the current framework. The key changes are highlighted in bold and are as follows:

   - all positions receive a capital charge based on their level of valuation uncertainty;
   - capital requirements are based on a fully integrated model;
   - full diversification is allowed between risks; and
   - capital horizons used as a basis for capital requirements are differentiated by product type.

Paradigm 4: Full fair value modelling approach							
Positions	**Valuation approach**	**Risk**	**Reg Book**	**Capital standard**	**Netting/Diversification/Correlation**	**Liquidity horizon**	**Other assumptions**
Fair value positions	**Fair value**	**Valuation uncertainty**	**N/A**	**TBC**	**TBC**	**TBC**	**TBC**
Interest rate positions	Fair value	Interest margin	N/A	**Integrated model**	Market implied off-sets and correlations **Diversifications with all other market risks** Charge for long and short positions (after diversification)	**Differentiated by product**	
		IRR	N/A	**Integrated model**		**Differentiated by product**	
Positions on single name credit, including those arising from OTC derivatives	Fair value	Default and migration	N/A	**Integrated model**		**Differentiated by product**	
	Fair value	Spread risk	N/A	**Integrated model**		**Differentiated by product**	
Securitisation positions	Fair value	Default	N/A	**Integrated model**		**Differentiated by product**	
	Fair value	Spread risk	N/A	**Integrated model**		**Differentiated by product**	
Equity positions	Fair value	Default	N/A	**Integrated model**		**Differentiated by product**	
		Specific equity risk	N/A	**Integrated model**		**Differentiated by product**	
		General equity risk	N/A	**Integrated model**		**Differentiated by product**	
Commodity positions	Fair value	Commodity risk	N/A	**Integrated model**		**Differentiated by product**	
Foreign currency positions	'Fair value' for FX	FX risk	N/A	**Integrated model**		**Differentiated by product**	

Annex 6

List of key recommendations

1. This DP makes the following recommendations to address identified failures in the current prudential regime for trading activities:

No	Key issue	Recommendation	Detail
Valuation			
1	Poor capture of valuation uncertainty as a risk factor	**A Pillar 1 capital charge to capture valuation uncertainty**	Valuations always contain an element of uncertainty, particularly in times of stress. This uncertainty represents a risk to the solvency of firms, and the regulatory framework should require firms to hold capital against this risk.
2	A lack of agreed and prudent valuation approaches for areas such as bid-offer adjustments and CVA	**Robust guidelines to ensure firms adopt prudent valuations**	Differences between the level of prudence in the accounting approach to valuation and that required by regulators result in a need for detailed regulatory valuation guidance for specific areas, where methodological guidance is not given in accounting standards, or where the guidance given does not meet regulatory requirements. The prudential filters framework should also be within the scope of the fundamental review to ensure valuation adjustments remain consistent in their rigour across all positions.
3	Inconsistency in valuation approach across jurisdictions between fair value and amortised cost	**A system of regulatory valuation adjustments to ensure a greater consistency in balance sheet valuation approaches**	Regulators and investors desire a level playing field in valuation approaches to ensure consistently reliable reported capital resources. This consistency is not evident in the current or anticipated accounting frameworks under US GAAP and IFRS. Valuation adjustments should be applied by regulators to set the valuation approach (fair value or amortised cost) to a consistent basis across jurisdictions based on a set of regulatory valuation principles.

No	Key issue	Recommendation	Detail
Coverage, coherence and the capital framework			
4	The continued arbitrage between the banking book and trading book for default risk through market implied measures of risk	**A consistent regulatory approach to credit assets**	Regulators should require a consistent approach to calculating capital requirements for credit default risk in positions, regardless of whether they are trading assets or not. A separate credit spread risk capital requirement should be applied in addition to credit default risk for fair valued assets. The capital/liquidity horizons of both charges could be varied.
5		**New methodologies to capture credit risk on fair valued assets**	A range of options are possible and may be applied based on a measure of complexity of the relevant products. **Option 1:** Allow credit risk to continue to be modelled, using a consistent approach for credit default risk, based on either an amended IRB approach or an IRC approach. The approach would incorporate regulatory set parameters to ensure an appropriate level of conservatism. **Option 2:** Restricted modelling only allowed for credit spread risk and, for credit default risk, only for the most liquid products, with more diversification benefit allowed within standardised rules for all other credit assets. **Option 3:** Consistent basic standard rules approach for all credit assets for both credit spread and credit default risks, with limited diversification benefit.
6	The poor capture of market illiquidity as a risk (including the assumption of liquid hedging markets)	**Market liquidity risk forms part of the regulatory capital requirements**	A differentiated approach to market risk capital standards based on a measure of the liquidity resilience. This includes liquidity being factored in to any future trading book boundary. The calibration of the prudent valuation framework requirements and the market risk capital requirements should be linked by a consistent assessment of liquidity horizon.
7	A failure to capture spread risk on banking book positions subject to fair value	**Explore linking valuation and capital requirements**	A consistent approach to valuation could allow a consistent boundary for market risk, by requiring all positions held at fair value to have market risk capital – reflecting the reality that they are the set of positions that pose a risk to solvency of firms due to market movements.
8	The failure to capture in Pillar 1 the interest rate risk of banking book positions, subject to amortised cost	**Consideration of Pillar 1 capital charge for interest rate risks on amortised cost assets**	Consideration should be given to including Interest Rate Risk in the Banking Book (IRRBB) in the Pillar 1 framework. We will publish a DP exploring the key issues in this area and outlining our framework for challenging firms' calculations of this risk by Q4 2010.

No	Key issue	Recommendation	Detail
Coverage, coherence and the capital framework			
9	The failure to capture certain elements of counterparty credit risk – in particular CVAs	**A coherent approach to capturing CVA volatility risk**	The BCBS December 2009 proposal is an important first step in capturing CVA volatility risk – however, a longer-term approach is needed. A first step should be a consistent and coherent approach for calculating CVA adjustments. A longer-term capital framework can then be delivered – consideration should be given to incorporating the CVA capital requirements within a coherent market risk framework.
10	Insufficient capture of specific risk factors driving losses, including the additional risk in complex products	**Contingent market risk, gap risk and hedging risk captured in capital framework**	All three risks drove significant losses in the crisis and should now be explicitly captured in the regulatory framework. A number of approaches to achieve this may be possible, we believe stress testing must form at least part of the solution to ensure robust levels of capital for these risks, even in benign periods.
Risk management and modelling			
11	Incomplete regulatory oversight of trading risk management	**Extend risk management standards and delink them from model approval**	Regulators should directly oversee independent risk management functions and front office activities. Minimum defined standards should be required in these areas before firms can trade in a particular asset class.
12	Alternative measures of trading risks required to enhance the current internal models framework	**A full, coordinated, assessment of risk measurement approaches for trading activities**	A Basel level technical group should consider how to better capture the risk in traded products for capital purposes. Firms should also be required to hold capital against model risk and risk factors not incorporated in their models.
13		**Increased and better use of stress testing in the capital framework**	Regulators should complement model-based approaches with regulatory defined stress tests to set back-stops or additional capital compared to that generated by firms' internal models.
14	Inconsistent modelling standards across jurisdictions	**Improve international consistency in the application of risk modelling standards**	Regulators should improve coordination of model approval, possibly through a sufficiently expert cross-border group at the Basel Committee to supplement individual regulators' model approval processes, to ensure consistently high standards in internal models.
15	The significant difference between standard rules and internal models	**Ensure model removal is a credible threat**	Improved modelling standards, and a more coherent approach to standardised rules for capital, should produce a lower difference capital requirements delivered by models and standard rules. This should be used as the basis of a credible threat for removing model permission when firms fail to meet the required standards.

Annex 7

List of questions

Chapter 2

Q1: Are the most important interactions with a fundamental review of prudential requirements for trading activities covered in this chapter? If not what other key interactions need to be considered?

Chapter 5

Q2: Do you agree that the issues described above are the key issues that should be addressed in the fundamental review? If not, what other issues should also be addressed?

Chapter 6

Q3: Do you agree that valuation uncertainty should be dealt with via additional capital requirements? If not, what alternative approaches could be used?

Q4: In practice how can valuation uncertainty be consistently calculated?

Q5: Do you agree that detailed regulatory valuation rules be defined to ensure consistent standards in the application of fair value? If so, what areas would most benefit from such guidance?

Q6: Do you agree that a separate regulatory valuation model is not justified? If not, why not?

Q7: Do you agree that regulators should be able to adjust valuation approaches based on principles agreed at an international level? If not, how can regulators address the problem of significant differences in valuation approaches?

Q8: How should a set of rules that form the basis of a regulatory approach to valuation be constructed?

Q9: Do you believe the series of adjustments presented in this chapter would address the weaknesses identified during the crisis? If not, what other measures could be introduced?

Q10: Do you agree that a carefully designed valuation uncertainty charge could help to mitigate the leverage enabled by reliance on exuberant market prices?

Q11: What other measures could be used to mitigate the pro-cyclicality of fair value?

Chapter 7

Q12: Do you agree that the structure of credit markets means that credit positions have a different risk profile to those in other markets? If not, why not?

Q13: Do you agree that a consistent approach to credit default risk should be applied across all positions? If not, why not?

Q14: Do you agree that a net position in a fair-valued credit product should have a higher capital requirement than a net position in an amortised cost position? What type of netting should be allowed for each position and should it be consistent across all positions?

Q15: Do you agree that the three options presented are the main options available to capture credit risk? If not, what other approaches could be applied?

Q16: How could rules around netting in the restricted modelling approach for credit assets be applied in practice?

Q17: How could complexity be defined in a consistent way to tailor the approach to credit risk?

Q18: Do you agree that whether a position is fair valued should determine whether it attracts a market risk capital charge? If not, what alternative approaches could be used to improve the boundary issue?

Q19: Do you agree that there should be a differential approach to market risk capital standards based on an assessment of liquidity during adverse market conditions? If not, why not?

Q20: Do you agree that the calibrations of the prudent valuation requirements and the market risk capital requirements should be linked in a consistent manner? If not, why not?

Q21: How do you believe asset market liquidity should be measured?

Q22: How should regulators look to implement a liquidity market charge in a way that would not be pro-cyclical or stifle innovation?

Q23: Do you believe that IRRBB should form part of the Pillar 1 framework? If not, why not?

Q24: Do you agree that the three options represent the main alternatives in producing a long-term approach for CVA volatility? If not, what other alternatives could be considered?

Q25: Do you agree that contingent market risk should be captured in the regulatory framework? If not, why not? If yes, how can it be captured – would stress tests be sufficient and if so how could they be applied consistently?

Q26: Do you agree that capture of gap risk within the regulatory framework should be improved? Is stress testing the best approach to quantify the risk, if not how could this be done?

Q27: It is clear that firms face significant hedging risk/ costs that can be material loss drivers. How should this be captured in the regulatory framework? Should this be done through internal models being required to reflect the risks of a dynamic portfolio rather than using a constant risk assumption?

Chapter 8

Q28: Do you agree there should be greater oversight of risk management functions in firms, including front office activities? If so, are the standards set out in Box 8.2 and Box 8.3 the type of requirements regulators should expect to see? What tools could regulators use to achieve these outcomes?

Q29: Do you think that internal models should remain part of the regulatory capital framework? If not, what other ways could a risk-sensitive capital requirement be assessed?

Q30: Do you agree that improved modelling approaches should be developed to measure risk? If so, what alternative modelling approaches could be investigated?

Q31: Do you agree that back-stops and stress testing should have a more significant role in setting capital requirements? If not, why not?

Q32: Do you agree that internal model approval should be supplemented at a Basel level to improve consistency? If not, why not, are there alternative options?

Q33: Do you believe that the measures presented in this chapter would address the issues related to risk management and modelling identified during the crisis? If not, what other measures could be introduced?

Chapter 9

Q34: Do you agree with the key policy questions that will determine the appropriate course of action? If not, what other key questions need to be addressed?

Q35: Do you agree that these paradigms represent the spectrum of frameworks that could be developed to address the key issues identified in this DP? If not, what other ways could a framework be developed?

Q36: Which paradigm do you believe represents the most successful solution presented in the DP and why?

Q37: Do you agree that these proposals will bring economic benefits by improving financial stability and market confidence? Do you agree with our high-level impact analysis for each paradigm? If not, what other costs and benefits do you think each paradigm may have on the market and the economy?

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