BANK OF ENGLAND

July 2014

The Financial Policy Committee's review of the leverage ratio

A Consultation Paper

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Background information on the Financial Policy Committee

The Financial Policy Committee (FPC) was established under the Bank of England Act 1998, through amendments made in the Financial Services Act 2012. The legislation establishing the FPC came into force on 1 April 2013. The objectives of the Committee are to exercise its functions with a view to contributing to the achievement by the Bank of England of its Financial Stability Objective and, subject to that, supporting the economic policy of Her Majesty's Government, including its objectives for growth and employment. The responsibility of the Committee, with regard to the Financial Stability Objective, relates primarily to the identification of, monitoring of, and taking of action to remove or reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system. The FPC is accountable to Parliament.

On 26 November 2013, the Chancellor requested the FPC to undertake a review of the leverage ratio within the capital framework, including as to whether and when it needs additional powers of Direction over the leverage ratio.

In parallel, the FPC identified a set of medium-term priorities, including on the design and calibration of the capital framework and on ending 'too big to fail' (TBTF).

The Financial Policy Committee:
Mark Carney, Governor
Jon Cunliffe, Deputy Governor responsible for financial stability
Ben Broadbent*, Deputy Governor responsible for monetary policy
Andrew Bailey, Deputy Governor responsible for prudential regulation
Spencer Dale, Executive Director responsible for financial stability
Martin Wheatley, Chief Executive of the Financial Conduct Authority
Clara Furse, external member
Donald Kohn, external member
Richard Sharp, external member
Martin Taylor, external member
Charles Roxburgh attends as the Treasury member in a non-voting capacity.

This document was finalised on 10 July 2014 and, unless otherwise stated, uses data available as at 16 June 2014.

* Member of the FPC as of 1 July 2014. Preceded by Charles Bean.

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The Financial Policy Committee's review of the leverage ratio

A Consultation Paper prepared under the guidance of the Financial Policy Committee.

Executive summary

On 26 November 2013, the Chancellor of the Exchequer requested the Financial Policy Committee (FPC) to undertake a review of the leverage ratio within the capital framework. This consultation paper sets out the FPC's analysis on the policy choices that would determine the role of a leverage ratio in the capital framework in the United Kingdom. The responses to this consultation paper will inform the final review intended to be published by the FPC by November 2014.

The calibration of the leverage ratio is outside the scope of this review, given the longer timeframe of the FPC's medium-term priorities on the capital framework and on ending 'too big to fail' (TBTF). As such, the focus of this review is primarily on the design of a leverage ratio framework. The determination of the appropriate numerical value of the leverage ratio would be considered by the FPC at the point when the capital framework and TBTF priorities are concluded next year. It is important that the capital framework, including the leverage and risk-weighted components, is assessed as a whole, taking into account the desired level of loss-absorbing capacity in the banking system on both a going and gone-concern basis.

A leverage ratio is increasingly recognised internationally as an important aspect of the capital framework for firms. As noted in Chapter 1, there are international initiatives to develop a leverage ratio requirement, and a number of countries have introduced, or are proposing to introduce, leverage ratios as part of their domestic regulatory regime.

As discussed in Chapter 2, the FPC sees a leverage ratio as an integral part of the framework and an effective complement to the existing risk-weighted capital requirements and buffers. How frequently and in what circumstances each capital measure will bind depends on their relative calibration and the types of risks to which banks are exposed. Therefore, the language of 'frontstops' and 'backstops' is potentially unhelpful. The leverage ratio is particularly effective at guarding against risks arising from modelling errors and from unforeseeable events. These include scenarios which may be thought to be 'low risk' until they crystallise. Recent history includes a number of examples where firms have suffered losses due to events that were thought highly unlikely beforehand, or that were unforeseen altogether.

Adding a leverage ratio requirement would mean that the capital framework for banks would comprise:

- A risk-weighted capital framework, in which capital requirements are set primarily in proportion to a historical assessment of risk in each asset class;
- A stress-testing framework, ensuring that banks are resilient to future adverse scenarios; and
- A leverage ratio framework, set in proportion to exposures regardless of their risk to guard against understatement of risk.

In designing a leverage ratio framework, a key question is whether certain features of the existing risk-weighted framework should be mirrored in the leverage framework. This is considered in Chapter 3. The main components of the risk-weighted framework include a minimum requirement, a capital conservation buffer, supplementary buffers for systemically important firms and a time-varying countercyclical capital buffer.

In 'steady state', the scope of firms subject to a leverage ratio framework could be defined by European legislation or by the FPC in the absence of such legislation. This consultation paper considers whether it might be warranted, on a transitional basis, to modify some aspects of the leverage framework or the scope of firms to which it would be applied in steady state.

As a baseline, a symmetrical leverage ratio framework could include a uniform minimum requirement across the relevant population of firms. Similarly, just as there is a case for a capital conservation buffer to complement the minimum risk-weighted ratio, there may be a case to introduce a leverage conservation buffer on top of the minimum leverage ratio.

Further, there may be a case to introduce a supplementary leverage ratio component to a subset of firms (eg ring-fenced banks and/or systemically important institutions) whose failure would be most destabilising for the financial system, in order to ensure that both ratios retain their relative roles in the framework. Chapter 4 considers whether such a supplementary leverage ratio should be varied in proportion to the associated supplementary risk-weighted ratio.

Chapter 5 considers the merits of a time-varying leverage ratio component, which would be varied in a countercyclical manner as system-wide risks evolve over the cycle. As a guiding principle, this could be varied in proportion to the risk-weighted countercyclical capital buffer.

This consultation paper sets out potential alternatives to the leverage ratio, such as risk-weight floors and firm-specific capital add-ons. This paper also sets out options regarding the quality of capital needed to meet each component that could form part of the leverage framework.

A leverage ratio could potentially become the binding constraint for businesses with high concentrations of low risk-weighted assets, most notably building societies and investment banks, and particularly for those which use internal models for the risk-weighted ratio. Boxes 5 and 6 set out the possible costs and benefits of applying a leverage ratio to such firms.

As part of the leverage review, the FPC will consider the allocation of responsibilities over the leverage ratio framework. As noted in Chapter 6, the design and setting of all components of the framework are integral to system-wide financial stability, and therefore of relevance to the FPC. Based on the analysis so far, the FPC is minded to recommend to HM Treasury that it be granted powers of Direction over all components of the leverage ratio framework that are not harmonised under European Union (EU) legislation. To ensure an appropriate introduction of the framework, the FPC would expect to include transitional arrangements, for example, during the transition period to the full EU Capital Requirements Directive and Regulation (CRD IV/CRR) risk-weighted framework in 2019. The leverage ratio framework could be applied to a subset of firms only, during any transitional period.

Chapter 7 sets out high-level considerations related to a cost-benefit analysis of a leverage ratio framework, which would form part of the FPC's final review in November.

In considering the design of a UK leverage ratio framework, the Committee notes an EU-wide framework could be introduced in the future. The status of a future EU-wide framework will become clearer in 2017, by which time the European Commission should have presented a comprehensive report on the leverage ratio to the European Parliament and Council.(1) Should such a European framework be introduced, Member States might still maintain some discretion over the design of aspects of the leverage ratio framework. Depending on the shape of a European framework in the future, the Committee could specify the relevant elements of the UK framework. This would be subject to the outcome of this consultation and any recommendations from the FPC.

The FPC would welcome comments from interested parties on all aspects of this paper. A list of questions on which the FPC would particularly welcome feedback is set out in Chapter 8. Comments should be received by 14 August 2014 to:

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Or by email to: leveragereview@bankofengland.co.uk.

(1) As set out in Article 511 of the EU Capital Requirements Regulation (CRR).

1 Introduction

On 26 November 2013, the Chancellor of the Exchequer requested the FPC to undertake a review of the role of the leverage ratio within the capital framework for UK firms. In response, this paper sets out the FPC's analysis of the policy choices that determine the role of the leverage ratio and asks for feedback on that analysis. The Committee will use the feedback from this consultation to inform its final review, which it expects to publish by November 2014.

This review complements the FPC's medium-term priorities on the capital framework and on ending TBTF as set out in the November 2013 *Financial Stability Report*. The terms of reference of this review are set out in Box 1. As requested by the Chancellor, HM Treasury officials were consulted in finalising the terms of reference of the review.

As noted in the terms of reference, the calibration of any leverage ratio is outside the scope of this review, given the longer timeframe of the FPC's medium-term priorities on the capital framework and on ending TBTF. As such, the focus of this review is primarily on the design of a leverage ratio framework, abstracting from questions of calibration. The design features considered in this consultation paper are consistent with a wide range of possible calibrations of the leverage ratio.

Introducing the leverage ratio

A leverage ratio is an indicator of a firm's solvency, and is the ratio of its capital relative to a gross measure of its exposures:(1)

$$\text{Leverage ratio} = \frac{\text{Capital}}{\text{Exposures}}$$

A bank with a low leverage ratio relies extensively on debt to fund its assets, and *vice versa*. A leverage ratio does not seek to estimate the relative riskiness of assets, as the risk-weighted framework does.

In the run-up to the global financial crisis, the excessive build-up of on and off balance sheet exposures was a material weakness of the banking system in many countries, including the United Kingdom. During the crisis, the banking sector was forced to rapidly reduce its leverage, exacerbating the impact on asset prices and on real economy lending. The leverage ratio aims to mitigate the risks of such excessive balance sheet stretch.

International developments

The leverage ratio is a key element of the international post-crisis regulatory reform agenda. The Basel Committee on Banking Supervision (BCBS) recently finalised the definition of the leverage ratio which is due to be disclosed by internationally active banks from 1 January 2015 to allow leverage ratios to be compared across jurisdictions. The BCBS will continue to monitor the implementation of the leverage ratio, and a final calibration of the leverage ratio is expected to be completed by 2017, with a view to migrating to a binding minimum requirement on 1 January 2018. In the EU CRD IV/CRR require the European Commission to report to the European Parliament and Council by the end of 2016 on the impact and effectiveness of the leverage ratio, accompanied by a legislative proposal where appropriate.(2)

As summarised in Box 2, a number of countries, including the United Kingdom, have introduced or are proposing to introduce leverage ratios as part of their domestic regulatory regimes. Some of these measures have been introduced ahead of the international timeline, and at times are more stringent than the 3% level that is being monitored by the BCBS. Where such measures have been introduced, the general intention is to apply the definition recently finalised by the BCBS.

The FPC supports these international developments and the desirability for EU and broader international consistency, including with regard to the definition of the leverage ratio. The proposals in this consultation paper seek to strike a balance between supporting these international developments and implementing a robust regime in the United Kingdom in anticipation of the potential EU-wide and broader international leverage ratio framework.

(1) The Basel III leverage ratio measures exposures to on and off balance sheet items. Throughout the review, 'assets' and 'balance sheet' are used as shorthand for this broader exposure method to facilitate ease of reading.
(2) Capital Requirements Directive (2013/36/EU) and the Capital Requirements Regulation (575/2013).

Box 1
Terms of reference of the FPC leverage review

On 26 November 2013, the Chancellor requested the Financial Policy Committee (FPC) to undertake a review of the leverage ratio within the capital framework. This review complements the FPC's medium-term priorities on the capital framework and on ending 'too big to fail' (TBTF), as set out in the November 2013 *Financial Stability Report*. The terms of reference of this review are set out below. As requested by the Chancellor, HM Treasury officials have been consulted in finalising the terms of reference.

Scope and objectives

The review will consider the leverage standard required to ensure that the UK banking system is sufficiently resilient. In doing so, the review will cover the following elements:

- the roles of and relationship between the leverage ratio and risk-weighted measures, including the relative strengths and weaknesses of each measure;
- international developments related to the leverage ratio;
- the definition and design of the leverage ratio (eg minimum and buffers);
- the merits and demerits of varying the leverage ratio in light of variations in the corresponding risk-weighted standards and, therefore, the merits of being able to vary the leverage ratio in a countercyclical manner;
- the appropriate leverage standards for ring-fenced banks;
- the case for Direction powers over the leverage ratio and how this would fit with the rest of the FPC's macroprudential toolkit, including the criteria to be used by the FPC when varying the leverage ratio;
- the impact of leverage standards on UK lending and GDP, and on those businesses with high concentrations in low risk-weighted assets or with different business models; and
- the transitional arrangements of leverage standards, including the circumstances under which it might be appropriate to introduce a leverage ratio on a faster timetable than international standards.

As noted above, the review aims to complement the FPC's medium-term work on the capital framework and on ending TBTF. In particular, a key part of the review is to assess the merits of varying the leverage ratio in proportion with risk-weighted standards (in a countercyclical manner and across subsets of firms). If the review were to conclude that this should be the case, then this would raise the question of the appropriate level of the leverage ratios and risk-weighted requirements, which are being covered by the capital framework and TBTF priorities. Given the differences in time horizons of these initiatives (twelve months for the leverage review, 18 months for the latter), the determination of the appropriate numerical value of the leverage ratio would be outside the scope of the leverage review, but would be revisited at the point when the capital framework and TBTF priorities are concluded.

Timetable

The FPC expects to publish the review by November 2014. Subject to the outcome of the review, this may be accompanied by an FPC recommendation, where relevant. Any potential recommendation will include a cost-benefit analysis, and will be sufficiently specific to assist HM Treasury in drafting a statutory instrument (if applicable).

Box 2
Summary of existing and proposed leverage ratio measures

Jurisdiction	Leverage ratio measure
United Kingdom	**Existing leverage ratio:** Following the Prudential Regulation Authority (PRA) June 2013 capital shortfall exercise, the eight major UK banks and building societies have been expected to meet, or to plan to meet, a 3% leverage ratio since 1 January 2014.(a) The PRA recently updated the definition of the leverage ratio for the purposes of the supervisory expectation. The leverage ratio is expected to be met with CRD IV/CRR end-point Tier 1 capital, and uses the BCBS 2014 definition of the leverage exposure measure.
Canada	**Existing leverage ratio:** The 'assets-to-capital multiple' is set at 5% with a possibility of being reduced to 4.35%. The leverage ratio can be met with total capital, and does not include all off balance sheet items. **Proposed leverage ratio:** In January 2014, the Office of the Superintendent of Financial Institutions (OSFI) announced that it plans to replace the assets-to-capital multiple requirement with a 3% Basel III-defined leverage ratio for federally regulated deposit-taking institutions.(b) OSFI will continue to set more stringent requirements on an institution-by-institution basis as circumstances warrant.
Switzerland	**Existing leverage ratio:** A leverage ratio has been applied to systemically important banks since 1 January 2013, requiring banks to meet a leverage ratio of between 3.1% and 4.56% by 2019, depending on the level of their risk-weighted requirements in the national framework.(c) This requirement comprises a hard minimum component and a buffer component, which is informed by the nature of the firm's risk-weighted requirements. The components of the leverage requirements may be met with the same quality of capital as for risk-weighted requirements, namely common equity Tier 1 capital and contingent convertible bonds. At present, the leverage exposure measure is based on the original 2010 BCBS definition, but the Swiss authorities have confirmed that the exposure measure will soon be harmonised with the 2014 Basel definition, for application from 1 January 2016.(d)
United States	**Existing leverage ratio:** There is currently a leverage ratio, which must exceed 4% for large banks.(e) It must be met with Tier 1 capital and does not include off balance sheet exposures.(f) **Future leverage ratio requirements:** From 1 January 2018, a supplementary leverage ratio will be applied to all banks on advanced approach internal models.(g) At the bank holding company level, this is composed of a 3% minimum for all these banks. Globally systemically important banks (G-SIBs) will be required to have a further two percentage points leverage ratio buffer (5% total requirement); firms that enter the buffer region will face restrictions on discretionary capital distributions. G-SIBs' insured depository institutions will be required to meet a 6% minimum to be considered 'well capitalised'. The supplementary leverage ratio will have to be met with Tier 1 capital. The US agencies are currently consulting on the final definition of the leverage exposure measure for the supplementary leverage ratio, and are proposing to align the definition with that in the final Basel standard.(h)
Denmark	**Proposed leverage ratio:** The final report of the Danish Committee on the Causes of the Financial Crisis, published in September 2013, supported moving towards a revised regulatory framework for credit institutions comprising risk-weighted and leverage requirements. The report noted that the 'Committee is generally sceptical as to whether a leverage limit of $33^{1}/_{3}$ (3%) in ordinary banks is sufficient to ensure that banks are sufficiently robust'.(i)
Netherlands	**Proposed leverage ratio:** In August 2013, the Finance Ministry recommended at least a 4% leverage ratio for systemically important banks. The Dutch Parliament is currently discussing the proposal.(j)
Sweden	**Proposed leverage ratio:** In May 2014, the Financial Stability Council decided that the need for introducing a leverage ratio ahead of EU standards to serve as a complement to risk-weighted ratios should be investigated.(k)

(a) Prudential Regulation Authority (2013a).
(b) Remarks by Deputy Superintendent Mark Zelmer to the 2014 RBC Capital Markets Canadian Bank CEO Conference, Toronto, Ontario, 14 January 2014.
(c) Capital Adequacy Ordinance; SR 952.03.
(d) Verordnung über die Banken und Sparkassen, April 2014.
(e) Banks using so-called 'advanced approaches' have had to meet a minimum 4% requirement since 1 January 2014; other banking organisation may be permitted to meet a 3% requirement until 1 January 2015. A 'domestic' leverage ratio has applied to US banks since 1981.
(f) In the US rules adopted in July 2013, the definition of Tier 1 capital for the domestic leverage ratio was aligned with the US agencies' transposition of the Basel III definition of capital for risk-weighted capital requirements.
(g) Final rule adopted April 2014.
(h) *Notice of Proposed Rulemaking*, April 2014.
(i) 'The financial crisis in Denmark — causes, consequences and lessons', published by the Danish Ministry of Business and Growth, 18 September 2013.
(j) *Kabinetsvisie Nederlandse Bankensector*, Dutch Finance Ministry, 23 August 2013.
(k) Minutes of the Financial Stability Council, www.regeringen.se/sb/d/18209/a/241631 (in Swedish only).

2 Role and objectives of the leverage ratio in the regulatory framework

This chapter sets out the role a leverage ratio can play as a complement to the risk-weighted capital ratio and stress testing. When combined with these other requirements, an appropriately calibrated leverage ratio may make individual firms more resilient and reduce the likelihood that the financial system is exposed to a systematic underpricing of risk.

Capital adequacy regulation seeks to promote the safety and soundness of individual firms and enhance system-wide stability by addressing market failures that can leave the system undercapitalised. These include:

- moral hazard, where deposit insurance and any perception of implicit government guarantees on firms' other liabilities may leave firms' cost of funds insensitive to their risk exposures. This might encourage firms to take greater risks than they would otherwise;
- information problems, where monitoring of firms' management by shareholders, depositors and other creditors is impeded by opaque business models and balance sheet positions; and
- systemic externalities, where firms do not consider the negative spillovers their own financial distress may have on the wider financial system and the real economy.

To mitigate these market failures, capital regulation seeks to ensure that firms fund assets with sufficient loss-absorbing capital, thereby reducing firms' probability of failure to a low, socially acceptable level. In the United Kingdom, the PRA has implemented the maximum-harmonising EU CRD IV/CRR.(1)

The role of the risk-weighted ratio

A risk-weighted capital ratio is an indicator of a bank's solvency, and is the ratio of its capital relative to a measure of its assets which is adjusted, or weighted, to reflect estimated risks: the intention is that safer assets receive a lower weight than riskier assets.

$$\text{Risk-weighted ratio} = \frac{\text{Capital}}{\text{Risk-weighted assets}}$$

The risk-weighted ratio in CRD IV/CRR provides a granular assessment of the risks in firms' portfolios. The risk weights used to arrive at risk-weighted assets are reliant on standardised requirements set by the regulator, which are typically based on historical industry-wide data, or on a firm's own internal models reflecting its own historical experience. To the extent that risk can be measured well, there are sufficient historical data, and past experience is a good guide to the future, risk-weighted ratios should be superior to other capital measures at matching a firm's capital requirements to risk.

There are, however, some significant weaknesses associated with the risk-weighted ratio, for example:

- Being based on historical data, models can fail to account for low probability but large impact events (known as 'tail events') because data are too limited to reflect them.
- Any risk weighting is prone to 'model error'. This includes risk weights based on firms' own internal models and those based on regulatory models used to design so-called 'standardised approaches' in the regulatory framework. Model errors can lead to underestimation of risk and imprudently low capital requirements. During an economic downturn, these errors can become systemic as the underestimated risks crystallise and firms are insufficiently capitalised to continue lending to the real economy.
- Complexity in the risk-weighted framework can undermine confidence in the solvency of firms and reduces the ability of the market to distinguish adequately between strong and weak firms. This can have the effect of stifling market discipline, reducing competition and leading to contagion from weak to strong banks.

Stress testing can to some extent correct for inadequate historical data but it relies on the imagination and willingness of firms and regulators to consider extreme events that are outside the realm of experience, and on their ability to model the financial system's response to them correctly.

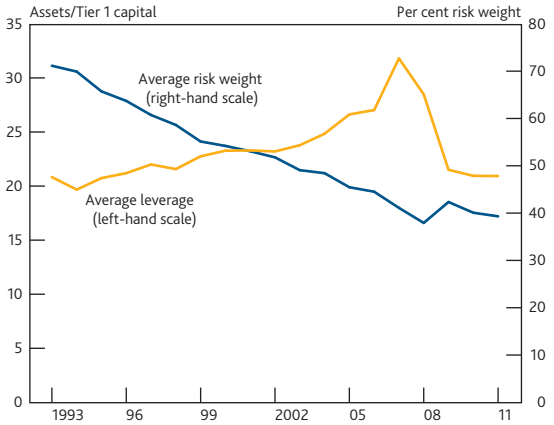
The dangers of relying only on the risk-weighted approach were borne out by the events leading up to and culminating in the financial crisis. Prior to recent reforms, firms in many countries, including the United Kingdom, were only subject to a risk-weighted capital requirement, which was seen as a comprehensive measure of risk. **Chart 1** shows the evolution of average weights over time: for major global firms under that regime, average risk weights fell almost continuously from 70% in 1993 to below 40% at the end of 2008. The financial crisis showed that the pre-crisis fall in average risk weights did not represent a systematic reduction in risk within the banking system.

The role of a leverage ratio

A minimum leverage ratio requirement also aims to promote individual firms' resilience through ensuring that capital is adequate to absorb losses, but it treats all exposures equally regardless of their estimated risk. It therefore makes firms and the financial system more robust to model risk and

(1) Prudential Regulation Authority (2013b).

Chart 1 Average risk weights since 1996[a]



Sources: The Banker and Bank calculations.

(a) Sample includes Bank of America, Barclays, BNP Paribas, BNY Mellon, Citigroup, Commerzbank, Deutsche Bank, HSBC, ING, JPM, LBG, RBS, Santander, State Street, UBS, UniCredit and Wells Fargo.

uncertainty. Since every model is a simplification of reality, all are subject to error. Though the performance of models can be improved, for example by relying on a range of different models, employing a longer history and better data or more accurate theory, there remains an irreducible amount of modelling risk associated with trying to model — ie simplify — reality. Risk underestimation due to model risk can be especially pronounced if the empirical distribution of losses obtained from the historical data is a poor guide to the true distribution of returns. For example, some of the losses incurred by firms during the financial crisis were due to exposures to products seen as 'very low risk' on the basis of their historical record — for example, AAA-rated 'super-senior' tranches of securitisations. And some models of stressed losses on mortgages in the United States did not factor in the possibility of a nationwide house price falls as those had not been present in the available data.(1)

A leverage ratio is also particularly suited to providing greater resilience against events which are not foreseeable by risk models and not foreseen by stress tests. This could be caused by a lack of historical data, or a lack of imagination in designing stress tests. The financial system is a highly complex network which adapts to the very models that financial system participants and regulators use to understand and oversee it. Given that the financial system evolves over time, including in response to new regulations, it is harder to model than fixed physical systems and there are likely to be limits on what can be modelled. Modelling limitations together with shocks that cannot be anticipated, for example *forces majeures* such as natural and man-made disasters and human or technical failure, pose a risk to firms and the financial system. These risks are particularly acute when financial leverage is high, because even small shocks might be amplified to a degree where they threaten the solvency of firms and the system as a whole.

The leverage ratio is also a relatively simple measure, which might be more readily understood by market participants and more comparable across firms than risk-weighted measures or stress tests.

A leverage ratio for firms is likely to have beneficial effects at the system level. High and rising levels of leverage in the system are often associated with credit booms, excessively large balance sheets and underpricing of risk, as occurred in the run-up to the crisis. Because buoyant economic conditions often coincide with periods of high profits and subdued credit losses, models based on data from benign periods will tend to underestimate the potential for losses when conditions turn.(2) A minimum leverage ratio requirement can limit the extent to which capital ratios in the system are driven down during benign conditions. In doing so, a leverage ratio can also curtail excessive balance sheet growth and act as a constraint to such excess before it occurs and provide loss absorbency should it crystallise.

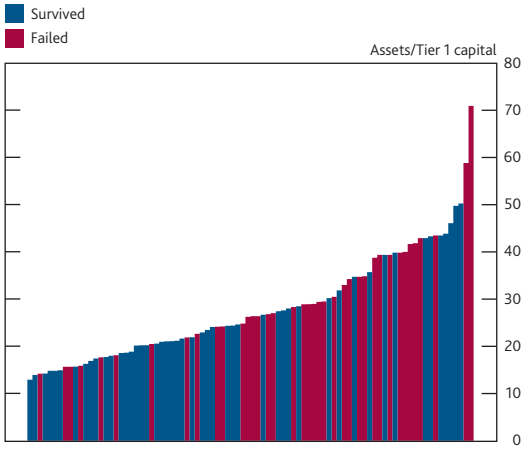
In boom periods firms tend to rely to a greater extent on less stable, and potentially underpriced, wholesale funding to increase their leverage, making the system more susceptible to precipitous contractions and deleveraging in a downturn.(3) Similar conclusions are reached in empirical studies, which show that firms that were more leveraged in the run-up to the financial crisis reduced lending by more during the crisis than less leveraged firms.(4)

High leverage at the start of the global financial crisis was associated with a greater likelihood of subsequent bank failure (**Chart 2**). This is consistent with a range of academic studies which find that the leverage ratio sometimes performs better at predicting failure than risk-weighted capital ratios.(5)

But **Chart 2** also shows that the leverage ratio on its own is not sufficient: some banks that failed were not highly leveraged. More generally, evidence that the leverage ratio performed better at predicting failure does not necessarily lead to the conclusion that relying solely on a regulatory leverage ratio would have prevented the crisis. In many jurisdictions, leverage was not a regulatory constraint. Had it been a constraint, firms might have behaved differently. If used in isolation, the leverage ratio's main strength would also be its main weakness: it ignores the information that does exist on individual assets' riskiness when assessing capital adequacy. The leverage ratio on its own would therefore fail to take account of a significant aspect of the risks firms face.

(1) For example, see Bernanke (2010) and Lewis (2010).
(2) The countercyclical capital buffer may help to mitigate these concerns. But, as noted in Chapter 5, this may be insufficient, including because the countercyclical capital buffer is defined as a proportion of risk-weighted assets.
(3) As set out by Adrian and Shin (2008).
(4) See, for example, Kapan and Minoiu (2013).
(5) See, for example, IMF (2009), Demirgüç-Kunt, Detragiache and Merrouche (2010), Mayes and Stremmel (2014), Brealey, Cooper and Kaplanis (2011), Berger and Bouwman (2013), Blundell-Wignall and Roulet (2013), Hogan, Meredith and Pan (2013), Haldane and Madouros (2012), and Aikman *et al* (2014).

Chart 2 Leverage and bank failure as of end-2006[a][b]



Sources: Capital IQ and SNL Financial.

(a) Sample includes 88 large banks (assets greater than US$100 billion) from Canada, Europe and the United states. Notable exceptions are the five US banks that were investment banks at the time, because of data limitations.
(b) Classification of failed and survived follows Aikman *et al* (2014), which is an adaption of Laeven and Valencia (2010). Beyond clear-cut cases of failure and nationalisation, failed banks include when at least three of the following were present: (i) extensive liquidity support (5% of deposits and liabilities to non-residents); (ii) bank restructuring costs (at least 3% of GDP); (iii) partial bank nationalisation (including government recapitalisation); (iv) significant guarantees put in place; (v) significant asset purchases (at least 5% of GDP); (vi) deposit freezes and bank holidays. The classification departs from Laeven and Valencia's (2010) classifications of Swedbank and UniCredit and Banca Intesa as failures, given that the first benefited from the same market-wide support schemes as other Swedish banks not defined as failing and UniCredit and Banca Intesa did not take government assistance despite considering it. Nordea is not classified as surviving, given that its 2009 rights issue was partly funded by the Swedish Government and was classed as State Aid under EU law. For the ten institutions in the sample not classified by Laeven and Valencia (2010), the classifications of other publicly available sources are used to form a failure classification as close as possible to that of Laeven and Valencia (2010).

Firms would have incentives to over invest in high-risk assets, which could exacerbate this concern. Overall, the evidence suggests that the best approach to capital adequacy regulation is multipronged, using a range of complementary measures which capture different types of risk.

How frequently and in what circumstances each capital measure will bind depends on their relative calibration and the types of risks to which banks are exposed. Therefore, the language of 'frontstops' and 'backstops' is potentially unhelpful. The leverage ratio guards against model risk and rapid balance sheet expansion — in other words, a specific class of risk rather than the frequency with which the risk occurs. For example, as noted above, had leverage ratios been in place prior to the crisis, they would have bound more tightly than risk-weighted measures for a number of banks that subsequently failed. That could be seen as an indication of leverage ratios successfully guarding against a particular class of risk. A risk-weighted ratio, on the other hand, would constrain banks which would tend to shift into riskier assets if a leverage ratio was the only constraint.

Risk sensitivity and arbitrage

All capital measures, in isolation, are imperfect measures of risk. They can therefore create adverse incentives and are susceptible to arbitrage. Firms have incentives to take risks where the regulatory gaps are the largest, which will reduce the effectiveness of the respective measure in ensuring capital adequacy and investor confidence. A risk-weighted capital ratio, for example, has the potential to create incentives for firms to underestimate risk in their portfolio. Though a risk-weighted approach calibrated by regulators (for example, standardised approaches or floors) reduces that problem, there remains a risk that regulatory models are incorrect and subject to uncertainty. These errors and uncertainty can become systemic as the underestimated risks crystallise.

A leverage ratio creates incentives to invest in high-risk assets because firms would need no additional capital to fund them relative to low risk-weighted assets (known as the 'risk shifting' effect). In principle, this effect would be mitigated by applying a risk-weighted ratio as well. In practice, the empirical evidence for risk shifting is limited (Box 3), which may reflect the fact that experience of a binding leverage ratio is limited.

Table A summarises the adverse incentives created by reliance on individual capital measures — internal models, standardised approaches and the leverage ratio — and the measure that is best suited to address them.

Table A Adverse incentives exacerbated and mitigated by capital adequacy instruments

Adverse incentives	Exacerbated by	Mitigated by
Model optimisation/ use of ineffective models	Internal models	Leverage ratio/ standardised approach
Undesirable herding	Standardised approach	Leverage ratio
Risk shifting	Leverage ratio/ standardised approach	Internal models

Impact of the leverage ratio

There is an interplay between the leverage ratio and risk-weighted requirements. Their relative calibration will determine how often, both across firms and through time, each of the ratios would be expected to bind.

A simple illustration of the interaction is shown in **Chart 3**. For a fixed balance sheet size, as average risk weights increase, a firm needs to fund its assets with proportionally more capital (the upward sloping line). The leverage ratio does not scale assets by their estimated riskiness; instead it sets a maximum level of debt funding for a firm's balance sheet that is independent of average risk weights (the flat line).

Chart 3 illustrates that there is an average risk weight at which both constraints bind.[1] Firms with average risk weights below this 'critical' average risk weight will be bound by the leverage ratio; firms above that risk weight will be bound by the risk-weighted ratio. Increasing the leverage ratio requirement — or decreasing the risk-weighted ratio — will increase this critical average risk weight.

(1) This is an approximation only. The 'total assets' measure is not the same in both ratios because of different treatments of off balance sheet items.

Box 3
Evidence for risk shifting

There exists an extensive literature documenting the shift of banks' balance sheets towards riskier assets at the level of individual, financially distressed firms — a phenomenon sometimes known as 'gambling for resurrection'.(1) But there has been very little empirical analysis addressing the question of whether coarser regulatory approaches, such as the leverage ratio or standardised approaches, cause firms to shift risks.

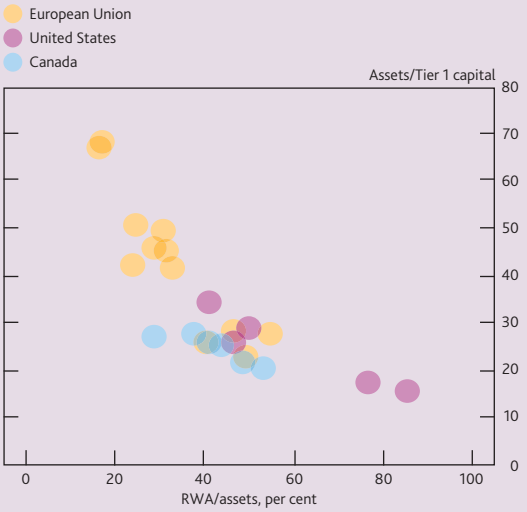
One exception is the study by Furlong (1988), who examined how the behaviour of 98 US bank holding companies was affected by the introduction of the leverage ratio in 1981. Furlong measured bank riskiness using the volatility of the return on assets, as implied by the volatility of the return on equity using the Black-Scholes option formula. While Furlong found that the riskiness of US banks increased after the leverage ratio was introduced, he found no difference between the banks constrained by the regulation and unconstrained banks. However, he also found that constrained banks reduced their holdings of low-risk, liquid assets by more than unconstrained banks — consistent with some degree of risk shifting.

Sheldon (1996) employed a similar approach to study the impact of Basel I on bank risk. Basel I was based on a standardised measure of risk with little granularity. Using a sample of 219 banks across eleven countries, he found that the volatility of asset returns fell following the introduction of Basel I, indicating reduced risk-taking, but without any discernable difference between the banks constrained by the regulation and those that were not.

Becker and Ivashina (2013) provide more recent evidence of risk shifting from the insurance sector. The authors find that insurers' corporate bond portfolios appear to be systemically biased towards higher yield, higher risk bonds within each regulatory risk-weight bucket. This result is more pronounced for insurance firms for which capital requirements are more binding. The authors also study the portfolios of pension and mutual funds — neither of which are subject to capital regulation — and find no evidence of risk shifting for these firms.

Using cross-country data on large banks, **Chart A** plots the average risk weight of large banks in Canada, the EU and the United States as of end-2007 against their balance sheet leverage. Continental European and UK banks faced only a risk-weighted regime. Canadian and US banks faced the same constraints, but were also leverage constrained.(2) EU banks by and large had greater leverage and lower average risk weights than North American banks. In contrast, North American banks tended to have higher average risk weights, which may be indicative of risk shifting, a more conservative risk-weighted framework, or other structural differences in the banking system, for instance, the incidence of mortgages on banks' balance sheets.(3)

Chart A Average risk weights, leverage and capital ratios of major EU, US and Canadian banks(a)(b)



Sources: Bloomberg, FDIC, annual reports.

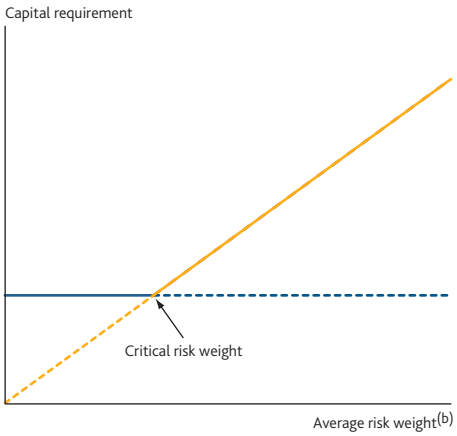
(a) Data as of end-2007. Sample includes Bank of America, Barclays, BMO, BNP Paribas, BNY Mellon, CIBC, Citigroup, Crédit Agricole, Credit Suisse, Deutsche Bank, HBOS, HSBC, JPM, Lloyds, NBC, RBC, RBS, Santander, Scotiabank, Société Générale, State Street, TD, UBS, UniCredit, Wachovia and Wells Fargo.
(b) Canadian and US banks' balance sheet size is adjusted for IFRS.

(1) Eisdorfer (2008).
(2) In contrast to the Canadian leverage ratio, the US leverage ratio version only captured on balance sheet items. As a result, US banks could conceal their true leverage by putting assets off balance sheet. This might make their Asset/Tier 1 capital ratio less informative.
(3) US banks were subject to a Basel I type framework during this period. The EU and Canada were in the process of implementing Basel II, so some banks might have applied parts of Basel II (which generally resulted in lower risk weights).

The further a firm's average risk weight is below the critical risk weight, the greater the impact on the firm if a leverage ratio is introduced: firms with low average risk weights would therefore face greater capital shortfalls than firms with higher average risk weights. This shortfall would tend to increase more than proportionally to an increase in the leverage ratio.(1) In principle, this is consistent with the objectives of the leverage ratio. A firm with low average risk weights will be able to fund its assets with a substantial amount of debt and only very little equity. As such, it will be particularly

(1) This 'non-linear' effect is only present when the leverage ratio is first introduced (or becomes the binding constraint for a firm for the first time). Any subsequent increases would imply the same capital shortfall for all firms bound by the leverage ratio.

Chart 3 Stylised capital requirements implied by the leverage ratio and the risk-weighted ratio[a]



Source: Bank calculations.

(a) The risk-weighted capital requirement increases linearly (orange line). The leverage ratio capital requirement stays constant (blue line). The 'critical risk weight' is the average risk weight for which both ratios imply the same amount of capital.
(b) Risk-weighted assets/total assets.

susceptible to small errors in models or to the type of unexpected shocks that the leverage ratio guards against. This is precisely the vulnerability of the existing risk-weighted framework that the leverage ratio seeks to address.

But, as a consequence, the introduction of a leverage ratio might result in a greater capital requirement than the risk-weighted ratio for firms with low average risk weights. All else equal, if the leverage ratio led to additional capital requirements for firms with low average risk weights, that would cause a decline in their return on equity. This effect is discussed further in Box 4.

In response, firms could increase the riskiness of their assets in search of higher returns, and could raise their average risk weights above the critical level at which the leverage ratio binds. This reaction would be consistent with risk shifting being a consequence of the leverage ratio. This could lead to firms taking on additional high risk-weighted assets, or decreasing holdings of low risk-weighted assets. As shown in the chart in Box 4, this would imply a move towards the kink.

Alternatively, firms could decide to increase net income by increasing lending rates or decreasing expenditures. Increased lending rates would have a direct impact on the firms' customers, who could either bear the cost or switch to competitors. This is not illustrated in the chart, but can be thought of as an upward move in the line that represents achievable return on equity.

The likelihood of each of these reactions occurring, and their costs to firms and the wider economy, must be weighed against the benefits of a leverage ratio outlined in this chapter. On the assumption that risk weights and returns reflect risk accurately and comprehensively, the impact on return on equity for firms with low average risk weights could represent a competitive distortion.

But this assumption should be seen in light of the motivation of the leverage ratio: risk weights and the returns of assets might not always reflect risk accurately, for example because of model risk. They might also not capture risk comprehensively, for example because of unforeseeable or unmodellable events, which are particularly acute for thinly capitalised firms. Low average risk weights might also not take into account the systemic impact that high leverage and sudden deleveraging might have during economic downturns. If low average risk weights understate these, then the benefits of the leverage ratio might outweigh the costs to the firms that are affected.

Alternatives to the leverage ratio

In principle, there might be other ways to address some of the shortcomings of the risk-weighted framework and increase its effectiveness in capturing risk. These could include asset class-specific risk weight floors, additional 'Pillar 2' capital add-ons (for example, following stress testing of portfolios), increased supervisory review of models, and additional disclosures. To the extent that these measures have the effect of raising risk weights or requiring additional capital buffers for low risk-weighted assets, they can act as more targeted alternatives to the leverage ratio. But, precisely because these instruments are more targeted at mitigating specific instances of model risk, they might not be able to address broader concerns associated with high leverage, such as unforeseeable events or precipitous system-wide deleveraging during downturns. The leverage ratio could be more effective in addressing these risks.

One alternative to the leverage ratio could be to set risk weight floors on specific asset classes where model risk is thought to be highest. In principle, this might be better than using a leverage ratio if the model risk associated with a particular asset class is known. For a firm that specialises in one asset class, the two approaches could have a similar effect. Consider a scenario where an asset class floor increases a firm's average risk weight (for example, that of a specialised mortgage lender) to the level of the critical risk weight implied by the leverage ratio, that firm would face the same capital shortfall under the risk-weight floor and the leverage ratio.

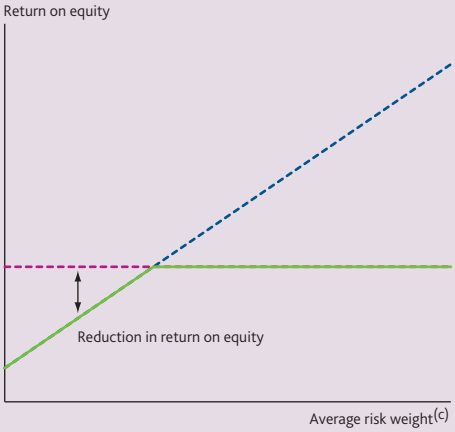
Risk-weight floors appear particularly suited to addressing model risk arising from inadequate data or risk underestimation for specific asset classes. The leverage ratio cannot be applied at such a granular level — it is applied at the level of the whole firm — making it less suitable to guard against model risks associated with particular assets. Using the leverage ratio in these scenarios might be overly crude, because many other asset classes would be affected.

Box 4
The impact of the leverage ratio on profitability

Imposing a leverage ratio could increase capital requirements for firms with low average risk weights. This should not affect their net income or return on assets. The direct impact of this would, all else equal, decrease their return on equity. **Chart A** illustrates this.

Less leveraged firms will, however, be more resilient and safer. As well as bringing wider benefits for financial stability, that may contribute to more sustainable returns for shareholders in the longer run, potentially leading to a lower cost of capital for affected firms.

Chart A Stylised return on equity implied by the leverage ratio and the risk-weighted ratio[a][b]



Source: Bank calculations.

(a) The chart illustrates the return on equity (RoE) that is achievable for a given return on assets and capital requirement.
(b) The RoE achievable from the risk-weighted requirement is constant (magenta line). This depends on the assumption that risk weights and returns increase at the same rate. The RoE achievable from the leverage ratio is upward sloping (blue line) because returns increase but the capital requirement is fixed. The return achievable in a framework with both constraints is represented by the green line.
(c) Risk-weighted assets/total assets.

But risk-weight floors might be less effective than the leverage ratio in addressing concerns around excessive balance sheet stretch. Faced with floors on individual asset classes, some firms might simply move to other low-risk weighted assets, or to asset classes not subject to a floor — so leverage would not be constrained. Though this 'waterbed' effect could be mitigated with additional floors, the result might be a complex patchwork of requirements, with regulators finding themselves always trying to chase where risk shifts next. And floors on specific asset classes are generally less transparent and observable than a leverage ratio.

Floors would also constrain firms with relatively low leverage if applied to asset classes. If the policy concern is about the risks surrounding high leverage more generally, floors might be a less efficient method of addressing the problem than the leverage ratio.

Asset-class floors and the leverage ratio might therefore serve different and complementary purposes. It might be appropriate to restrict the amount of leverage for particular asset classes, for example because of model risk, or macroprudential concerns about risks in specific sectors. In these instances, every firm holding the relevant assets should be affected by the policy, regardless of its leverage. Floors might be best at mitigating these concerns. But regulators might also be concerned about model risk across the balance sheet or unsustainably high balance sheet leverage. In these instances, only firms that are highly leveraged should be affected, so the leverage ratio might be a simpler, more direct and transparent solution.

Another alternative to the leverage ratio could be 'Pillar 2' requirements, which the PRA may impose in the form of additional capital requirements on individual firms. These requirements largely cover risks that are not sufficiently captured in the CRD IV/CRR uniform 'Pillar 1' requirements — such as risks arising from highly concentrated portfolios — and risks to which a firm might become exposed in the future including those identified by stress testing. Pillar 2 therefore acts to further the safety and soundness of firms, in line with the PRA's objectives.

These requirements are flexible and can to some extent address shortcomings of other elements of the capital framework. For example, they can be used to require more capital from firms facing greater model risk or risks associated with high leverage. But it may be desirable for such measures to complement a uniform leverage ratio framework, as identifying firms that are particularly susceptible to model risk and unforeseeable events is inherently difficult. In addition, a uniform leverage ratio framework would have the advantage of being more transparent than Pillar 2.

Supervisory reviews of internal models can assist in dealing with concerns about poor model performance. In particular, hypothetical portfolio exercises — which take a set of common portfolios and ask how much capital banks' internal models would set against them — can highlight major differences among models, enabling supervisors to require firms with relatively low risk weights to raise them. These measures can be useful to shine a spotlight on specific areas of weak internal risk modelling and might lead to a better assessment of when internal models are appropriate. But

supervisory reviews and hypothetical portfolio exercises cannot address fundamental concerns related to the ability of models — both internal models and those determined by regulators — to adequately capture the range of risks stemming from unforeseeable events.

Disclosure requirements and initiatives can act to strengthen transparency, comparability and market discipline. In particular, the disclosure of a range of metrics for assessing firms' capital adequacy could give the market a variety of indicators about a firm's solvency position. More granular disclosure of modelled risk weights might also help the market in assessing the quality of a firm's risk-modelling. But it is not clear whether this would always be sufficient to guard against model errors and unforeseeable events — especially during booms when the market as a whole might be more sanguine about risks. Disclosure measures are an effective complement to the leverage ratio.

Question 1 Do you agree that the leverage ratio plays a complementary role to risk-weighted ratios and stress tests in assessing capital?

Question 2 Do you agree with the considerations regarding potential alternatives to the leverage ratio?

3 Leverage ratio framework and design elements

Chapter 2 describes the role of the leverage ratio as complementary to that of the risk-weighted ratio and stress testing. This chapter considers possible ways to maintain that complementary role by setting out considerations for the design of a leverage ratio framework and its interaction with the design of the risk-weighted capital framework.

In considering the design of a UK leverage ratio framework, the Committee notes that an EU-wide framework could be introduced in the future. The status of a future EU-wide framework will become clearer in 2017, by which time the European Commission should have presented a comprehensive report on the leverage ratio to the European Parliament and Council.(1) Should such a European framework be introduced, Member States might still maintain some discretion over the design of aspects of the leverage ratio framework. As noted in Chapter 6, in the absence of a European framework in the future, the Committee could specify the relevant elements of the UK framework. This would be subject to the outcome of this consultation and any recommendations from the FPC.

Symmetry and its implication

A framework of capital buffers was introduced in Basel III. These buffers require the conservation of capital before the minimum capital requirement is reached, help to mitigate concerns around systemic importance and enable an effective response to emerging risks. One way to maintain the complementary role of the leverage ratio and risk-weighted ratio could be to establish analogous buffers in the leverage ratio framework.

A symmetrical approach would entail that, in general, the leverage ratio requirement would take the form of a minimum where the corresponding risk-weighted standard is a minimum, and take the form of a buffer where the corresponding risk-weighted standard is a buffer. The relative size of leverage buffers as a proportion of the leverage minimum requirement would be the same as for the corresponding risk-weighted requirements. Finally, symmetry would mean that the consequences of a breach of requirements would be aligned between the leverage and risk-weighted frameworks. This would involve both heightened supervisory scrutiny and a set of restrictions on distributions that become increasingly constraining as buffers are depleted. This overall symmetry would enable the design of the leverage ratio framework to serve similar goals to that of the risk-weighted framework. The advantages of such an approach would need to be balanced against those of keeping the leverage ratio framework relatively simple.

There is international precedent for the inclusion of leverage ratio buffers. For example, as stated in Chapter 1, the US regulatory agencies recently finalised rules for a leverage surcharge requirement for global systemically important banks G-SIBs at the level of the bank holding company, which would take the form of a buffer and trigger distribution restrictions if drawn down. Similarly, systemically important banks in Switzerland are subject to leverage requirements which comprise a minimum and a buffer component.

Potential components of a leverage ratio framework

Symmetry would entail a leverage framework that comprised four components:

- A **minimum** leverage ratio requirement: A uniform minimum requirement across the relevant population of banks. The main policy choices in this component are discussed below;
- A leverage **conservation buffer**: A level above the minimum requirement which would act as a buffer to the minimum, similar to the capital conservation buffer in the risk-weighted capital ratio. This component of the framework is also discussed below;
- A **supplementary** leverage ratio: An extension of the leverage conservation buffer which could be applied for a subset of firms (eg ring-fenced banks and/or systemically important institutions). Chapter 4 discusses this component in more detail; and
- A **time-varying** leverage ratio: An extension of the leverage conservation buffer, which varies in a countercyclical manner as system-wide risks evolve over the cycle. It would be applied to all banks subject to the minimum requirement. Chapter 5 discusses this component in more detail.

Definition of the leverage exposure measure

As outlined in Chapter 1, a leverage ratio can be generically defined as the ratio of capital to gross assets. However, the accounting measure of assets is unsuitable as a basis for a leverage ratio when applied internationally, because accounting standards differ markedly. As such, the definition of the leverage 'exposure' measure (ie the denominator of the leverage ratio) agreed by the BCBS in January 2014 controls for differences in accounting standards. The European Commission is currently drawing up a Delegated Act, which will amend the CRD IV/CRR definition of the leverage ratio exposure measure to align it with the definition agreed by the BCBS in January 2014. CRD IV/CRR requires some firms to report and disclose their leverage ratios on the basis of this exposure measure definition.

(1) As set out in CRR Article 511.

The Committee's view is that the exposure measure definition for the leverage ratio in the UK framework should be aligned with the BCBS definition, as implemented in the EU through CRD IV/CRR. International consistency is desirable, as it allows for firms in different countries to be compared. Inconsistencies in leverage ratio measures made it difficult for markets to assess the relative solvency positions of banks during the global financial crisis.

Eligible capital

The leverage ratio requirement should be met with capital of sufficiently high loss absorbency. The CRD IV/CRR risk-weighted capital regime specifies minimum going-concern capital requirements in terms of minimum common equity Tier 1 (CET1) and Tier 1 capital ratios.(1) Firms must have a minimum 6% Tier 1 risk-weighted ratio, of which at least 4.5 percentage points — or 75% — must be met with CET1 capital, the most subordinated and loss-absorbing form of capital. This restriction is a way to ensure that firms fund their assets with the highest quality capital. Under CRD IV/CRR, Pillar 1 risk-weighted buffers are to be met entirely with CET1 capital.

A symmetrical approach would mean that the minimum leverage ratio would need to be met by at least 75% CET1, with at most 25% to be met by AT1 instruments. Leverage buffers would be met with CET1, in line with the quality of capital for the risk-weighted buffers.

However, AT1 instruments must convert or write-down upon a trigger which, under the risk-weighted regime established under CRD IV/CRR, is set at a minimum of 5.125% of risk-weighted assets (RWAs). Since one objective of the leverage ratio is to guard against model risk in the risk-weighted framework, it may be inappropriate to allow AT1 instruments, which effectively rely on the appropriate calculation of the risk-weighted ratio, towards meeting the leverage ratio, particularly where the trigger is low; this risk is less pronounced the higher the trigger level is set. For this reason, one approach could be to require the minimum leverage ratio component to be met by at least 75% CET1 capital and at most 25% of AT1 capital instruments of sufficient quality. As noted by the Prudential Regulation Authority (PRA), firms choosing higher triggers will face a lower risk of their AT1 instruments failing to trigger in time to prevent their failure.(2)

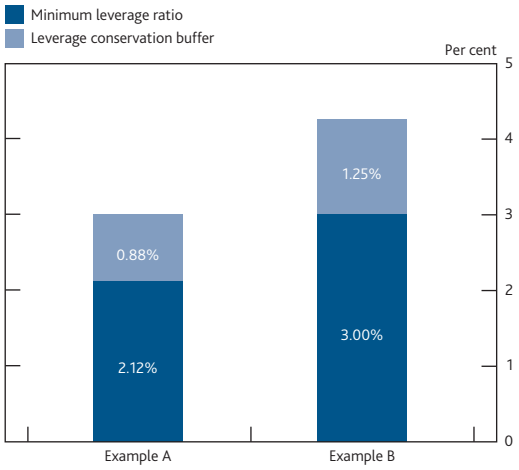
An alternative way of addressing potential concerns about the suitability of AT1 instruments in the leverage framework would be to require all components to be met solely with CET1 capital. This approach would have the benefit of ensuring sufficient loss absorbency, but could entail higher costs associated with funding a greater proportion of assets with CET1.

Leverage conservation buffer

The risk-weighted framework requires all firms to maintain a capital conservation buffer of 2.5% of RWAs. If the buffer is drawn down, automatic sliding restrictions are placed on capital distributions, such as dividends and bonuses. Mirroring this requirement in the leverage framework would imply that those firms bound by the leverage ratio would be required to conserve capital as they approached the minimum leverage requirement. It might also ensure that banks have a sufficient amount of capital above their minimum leverage requirements to withstand periods of stress while continuing to provide services to the real economy. The minimum leverage ratio and the leverage conservation buffer could form a 'baseline' leverage requirement that applies to all firms (within the scope of the framework) all the time.

A framework including a minimum leverage requirement and a leverage conservation buffer could conserve the relationship between the risk-weighted buffer and the minimum requirement. **Chart 4** shows this relationship for stylised calibrations of the minimum leverage requirement. These calibrations are for illustration only and should not be considered a reflection of the FPC's thinking on calibration.

Chart 4 Examples of the relative size of a minimum leverage requirement relative to a leverage 'conservation buffer'(a)



Source: Bank calculations.

(a) The ratio of the leverage conservation buffer to that of the minimum leverage ratio in these examples is the same as the ratio of the risk-weighted capital conservation buffer (2.5%) to that of the risk-weighted Tier 1 minimum ratio (6%).

Table B summarises the aspects of a leverage ratio framework that would be largely symmetrical to the risk-weighted framework.

Level of application

Capital requirements may be applied both at the level of the consolidated banking group and at more granular levels within

(1) Tier 1 capital comprises CET1 capital and so-called additional Tier 1 (AT1) instruments.
(2) See PRA (2013c).

Table B Design of a leverage framework that would be largely symmetrical to the risk-weighted framework

Component	Nature of the requirement	Quality of capital to meet requirement
Static minimum leverage ratio	Minimum requirement	Tier 1, of which at least 75% CET1 **or** 100% CET1
Conservation buffer	Buffer	CET1
Supplementary leverage ratio add-on	Buffer	CET1
Time-varying leverage ratio add-on	Buffer	CET1

a group. Whereas group capital requirements determine how much capital needs to be held against the group's overall balance sheet, the regulation of individual entities affects the allocation of this capital to specific parts of a group.

Under the PRA's implementation of CRD IV/CRR, risk-weighted capital requirements are applied both at group, sub-consolidated and individual entity levels. Preserving symmetry between risk-weighted and leverage requirements would imply that the leverage ratio framework would be applied both to whole groups and to the important individual entities which are subject to risk-weighted minimum and buffer requirements.(1)

This approach might have particularly desirable consequences for any time-varying leverage requirements. Not applying these at the same level of consolidation as the CRD IV/CRR countercyclical buffer (CCB) might imply that an increase in the CCB could be met to some extent through an optimisation of risk-weighted assets within the group. This could undermine the FPC's objectives in applying its time-varying framework.

However, the Committee recognises the potential costs of this approach, which must be set against the benefits. These costs relate to the reallocation of group capital and the possible requirement to raise additional capital to ensure that the group meets the sum of requirements for its individual entities in the jurisdictions in which it operates. In addition, other regulatory changes which are currently in train (eg structural reforms) could influence the role of capital requirements imposed on individual regulated entities.

If leverage requirements at individual entity level were considered necessary, the FPC would have flexibility over when it introduced them, if given the powers to do so. For example, the Committee could set leverage ratio requirements solely at the level of the consolidated group for a transitional period. This is the approach taken under the current PRA leverage ratio supervisory expectation. In the steady-state framework, the FPC could then take a decision on the application of leverage standards at individual level.

Transitional arrangements and the population of firms to which the leverage framework is applied

If EU legislation on the leverage ratio is implemented in the future, it will determine the scope of firms subject to the framework in the United Kingdom. In the absence of an EU-wide leverage ratio framework, the FPC would set out its views on the appropriate steady-state scope of firms. Boxes 5 and 6 provide some considerations on how different business models — in particular those with a high concentration of low risk-weighted assets — might be affected by a steady-state leverage framework.

The FPC is also considering whether it might be warranted, on a transitional basis, to modify some aspects of the leverage framework outlined above or the scope of firms to which it would be applied in the steady state. Two possible options could include: (i) applying the framework to the same broad set of firms subject to the full CRD IV/CRR risk-weighted requirements but with symmetrical transitional arrangements up to 2019; or (ii) in the first instance, applying the framework to major UK banks and building societies alone and extend to the other firms after a defined period which could end at the point at which an international and European framework for a minimum leverage ratio requirement is implemented.

An advantage of applying the framework from the outset to the same broad set of firms subject to the risk-weighted framework is full risk coverage. As discussed in Chapter 2, the objectives of the leverage ratio are to mitigate model risk, provide resilience against unforeseeable shocks and constrain excessive balance-sheet stretch. The FPC considers that these risks are relevant to all firms subject to the full set of risk-weighted requirements. If not captured by the leverage ratio in the near term, a large number of firms would not be subject to the safeguards of a leverage ratio during the period, before it was extended to all firms. This could be a particular concern if these firms were susceptible to expanding their balance sheets rapidly during this period (eg by relying on wholesale funding). Moreover, were the FPC to set a CCB rate above zero during this period, more firms would be subject to the CCB rate than those subject to the associated time-varying leverage component discussed in Chapter 5.

Applying the leverage ratio to all firms from the outset would allow for the risk-weighted and leverage ratios to vary together. But that could result in complex transitional arrangements. Different parts of the CRD IV/CRR risk-weighted framework will be introduced gradually over the next few years (for example, as of 2016 for the capital buffers). And different firms are subject to different risk-weighted transitional arrangements. For example, since the start of

(1) CRD IV/CRR requires leverage ratio disclosure at a consolidated level and also at the level of subsidiaries which the firm has identified as being 'significant to the group or to the local market' (CRR Article 13).

Box 5
The impact of a leverage framework on building societies

This box considers the potential impact of a leverage ratio framework on building societies.

At present, building societies can have relatively high leverage because at least 75% of their loan book must be fully secured on residential property. Where firms have permission to use internal models, these loans are generally associated with low risk weights. The aggregate average risk weight on UK mortgages under the internal models approach is around 15%. These low risk weights in large part reflect the property collateral held against mortgages. Assuming a risk-weighted capital ratio of 8.5% Tier 1 capital — the sum of a 6% minimum and a 2.5% conservation buffer — a firm with model approval could fund a £100 mortgage with only £1.30 of Tier 1 capital.(1) This implies leverage of over 70× capital.

Although the ways in which building societies bound by the leverage ratio could adjust are similar to banks, there are some additional sector-specific considerations. As mutuals, building societies are not able to issue ordinary shares, although they can issue common equity-like instruments. The market for these instruments tends to be smaller than for common equity instruments, and as a result investors might require a higher return than on equity issued by banks. As a result, building societies, particularly smaller ones, might prefer to rely on retained earnings rather than raising additional external capital. These factors could therefore imply the need for sufficient transitional arrangements.

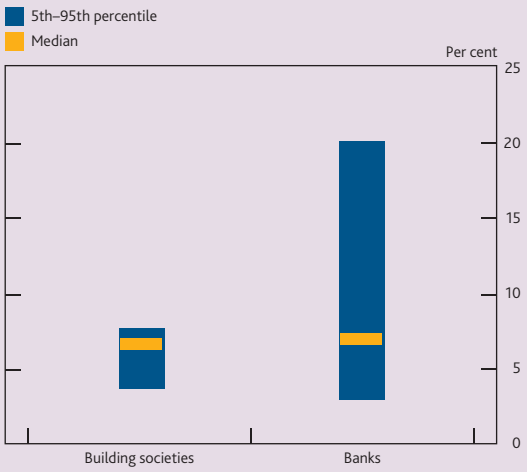
Building societies with a binding leverage ratio could diversify into other asset classes with higher risk weights. The associated higher expected returns might assist building societies in generating capital or offering competitive returns to new investors. However, building societies' experience of diversifying into other asset classes has not always been successful. For example, the Financial Services Authority identified Dunfermline Building Society's commercial property loans as a key reason for its failure.(2) Diversifying into new asset classes could increase risks for the firms concerned. A weakening of underwriting standards to target riskier mortgage lending could create similar risks. It is important therefore that firms have in place a robust risk management and control framework and the necessary knowledge of their businesses. The PRA's supervisory approach to these firms, which takes the form of a continuous assessment, can decrease the risks of moving into higher-risk lending without sufficient expertise.

Finally, societies that cannot raise or retain enough capital within the transitional period might choose to improve their leverage ratios by selling assets and reducing certain business activities. This would be more likely when the timeframe to meet the requirement is short — such as might be the case with the time-varying leverage ratio. The business activities most likely affected would be those associated with lower risk weights, which would usually include mortgages. Reduced business activity by those building societies bound by a leverage ratio could affect their mortgage lending volume. The macroeconomic impact would depend on the extent to which other firms — banks and building societies — replace the affected societies' market share.

Increasing capital levels without diversifying business mix might result in higher lending rates on mortgages in the short term, to the extent that any higher funding costs are passed on to consumers. The probability and impact will depend on the calibration of the leverage ratio, societies' profitability — profitable societies might already have sufficient returns to attract or retain capital — and competitive constraints.

In practice, most building societies are not currently more highly leveraged than banks. **Chart A** compares UK building societies' leverage ratios with those of UK banks, which suggests that the majority of the sector would not be disproportionally adversely affected by a leverage ratio requirement.(3) The median leverage ratio of the building society sector is roughly the same as that of banks, and the low end of the 5th–95th percentile range is slightly higher than that of banks. However, the banking sector and the building society sector are concentrated, with a small number of firms holding a large proportion of total assets (**Chart B**). A leverage ratio requirement could therefore affect a majority of assets within the sector if it bound on the larger societies.

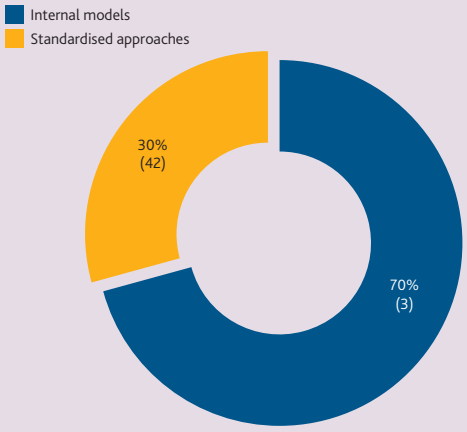
Chart A Estimated leverage ratios(a)(b)



Sources: PRA and Bank calculations.

(a) Based on estimates of the January 2014 BCBS definition of the leverage ratio.
(b) Includes 45 building societies and 50 banks.

Chart B Total assets held by building societies[a]



Source: Regulatory returns.

(a) Percentage number shows proportion of assets held by building societies using internal models and those on standardised approaches. The number in parentheses indicates how many firms belong to the relevant group.

This current level of leverage is driven by two factors. First, most building societies use the standardised approach to risk weighting, rather than internal models. In the United Kingdom, all mortgages on the standardised approach to credit risk carry at least a 35% risk weight. This results in a maximum leverage of around 33× capital.

Second, some building societies build up voluntary buffers because they might find it relatively more difficult to raise external capital than banks. As a result of this additional capital their leverage is relatively low, and a baseline leverage ratio — the minimum requirement and the leverage conservation buffer — may not be more binding for them than it would be for more diversified banks.

Overall, the FPC believes that the building society sector and other firms with low risk-weighted assets would not be disproportionately affected by a baseline leverage ratio. This will, however, depend on the level at which the leverage ratio is set and the length of the transitional period. A short transitional period and a leverage ratio that creates considerable capital shortfalls for most building societies would likely present a greater challenge to building societies than to banks. This might be particularly the case for the time-varying leverage ratio. One factor that could mitigate these concerns is that the time-varying leverage ratio is likely to be activated during credit upswings, when building societies should be profitable.

In principle, the FPC is minded to believe that the building society sector should not receive a derogation from the framework in steady state. Though most societies are not highly leveraged now, their business model requires a concentration in mortgages. Societies that receive internal model approval could therefore in principle be very highly leveraged and therefore exposed to considerable model risk and risks from small unforeseeable shocks that might threaten their solvency. These risks would be accentuated if the sector as a whole became highly leveraged in future booms. As such, the benefits of a leverage ratio in steady state, when it would have a relatively small impact on the sector, seem significant.

(1) The capital charge in the example is determined by multiplying the £100 exposure by the 15% risk weight and the 8.5% minimum Tier 1 capital requirement, and is rounded up to one decimal place.
(2) Lord Turner's letter to the Chancellor of the Exchequer, 17 April 2009.
(3) Excluding investment banking subsidiaries of foreign banks.

2014, the PRA has applied a supervisory expectation to the largest eight UK banking groups to meet a CET1 ratio of at least 7%. Symmetrical transitional arrangements for the leverage ratio framework for all firms would result in a relatively gradual and complex setup, with different sets of firms subject to different transitional leverage ratio requirements.

On the other hand, an approach that applies the leverage ratio framework to major UK banks and building societies only would allow for a relatively simpler arrangement. And, for those firms, it might also facilitate convergence towards an international leverage ratio framework in the future. As noted in Box 2, a number of jurisdictions have taken such an approach and will introduce (or are proposing to introduce) leverage ratio measures over the next few years for a subset of firms.

Such an approach would capture the most systemically important UK firms. As noted in Chapter 1, since the start of 2014, the PRA has applied a supervisory expectation to the major eight UK banks and building societies to meet, or have plans agreed with the PRA to meet, a 3% leverage ratio on an ongoing basis.[1] These firms represent about 50% of all UK banking sector assets. Together they account for more than 70% of lending to UK households and non-financial corporates, and more than 75% of deposits. The set of firms also includes all UK banks identified by the Financial Stability Board as G-SIBs.

(1) PRA (2013b).

Box 6
The impact of a leverage framework on investment banks

Some investment banking activities, particularly trading in intrafinancial sector products, give rise to complex modelling and a high degree of interconnectedness with other financial institutions. Complexity and interconnectedness create risks, such as modelling risk and risks from unforeseeable events, that the leverage ratio seeks to mitigate. Since investment banks are exposed to such risks and provide important services to the UK economy, they should in principle be subject to the leverage ratio. However, some investment banks have low risk-weighted capital requirements and may therefore be constrained by leverage ratio requirements. This box assesses how the impact of a leverage ratio might vary across investment bank business models and how it could affect investment banks' provision of services in facilitating trades in repo, securities and derivative markets.

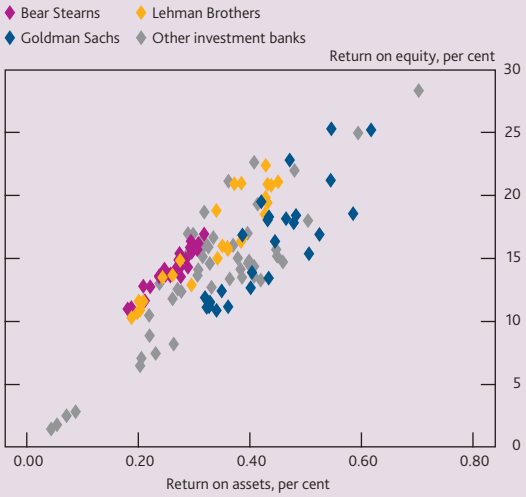
Although often associated with high leverage, the most commercially successful investment banks have not always been those with the highest leverage. Indeed, it has been possible to have a sustainable investment banking model with relatively lower levels of leverage. As **Charts A** and **B** show for US 'pure play' investment banks (ie those focused on investment banking services only) before the crisis, higher return on equity was more strongly associated with higher return on assets than leverage.(1)

Chart A Return on equity and leverage for US investment banks(a)(b)(c)(d)

Sources: Capital IQ and FDIC.

(a) Other investment banks comprise Merrill Lynch and Morgan Stanley.
(b) Quarterly data from 2000 Q4–2006 Q4.
(c) Return on equity is twelve-month trailing net income divided by equity. Leverage is total assets divided by equity.
(d) Assets are adjusted to be on an IFRS basis.

Chart B Return on equity and return on assets for US investment banks(a)(b)(c)(d)



Sources: Capital IQ and FDIC.

(a) Other investment banks comprise Merrill Lynch and Morgan Stanley.
(b) Quarterly data from 2000 Q4–2006 Q4.
(c) Return on equity is twelve-month trailing net income divided by equity. Return on assets is twelve-month trailing net income divided by total assets.
(d) Assets are adjusted to be on an IFRS basis.

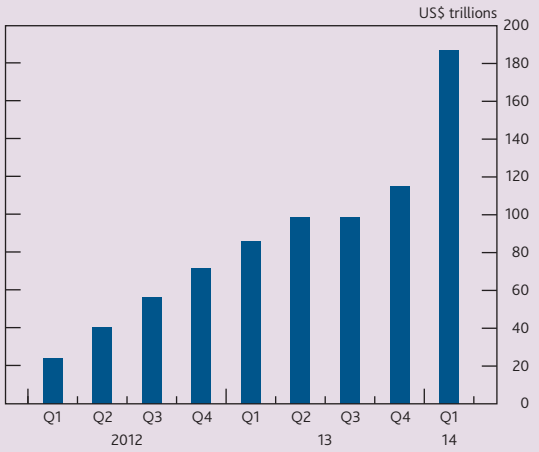
However, it is possible that banks have generated higher returns on assets to some extent by holding riskier assets. This might have been made less profitable by the reforms introduced as a result of the crisis. For the banks in the sample, a market-based measure of risk suggests that a higher return on assets was indeed associated to some degree with greater balance sheet risk.(2)

While some investment banking models may be able to operate successfully at lower levels of leverage, the introduction of a leverage ratio might affect activities with low income margins and low risk weights, such as repos and trading in derivatives, which were supported by low capital requirements prior to the crisis. European investment banks, which did not face a leverage constraint in the past, could be particularly affected. In the third quarter of 2013, major investment banks typically reported average risk weights of between 12% and 19% for their global investment banking divisions.

It is possible for investment banks to reduce leverage without affecting the total provision of derivatives, through derivative 'trade compression' — the process of reducing exposures by eliminating offsetting trades among counterparties. This may be desirable to the extent that trade compression is associated with a genuine reduction of risk. **Chart C** shows that banks are increasingly utilising trade compression already to reduce their outstanding derivatives.

One way in which market liquidity provided by investment banks could be affected is through reduced inventory holdings for the purposes of market making. Dealers subject to

Chart C Cumulative compressions of derivative trades (notional)

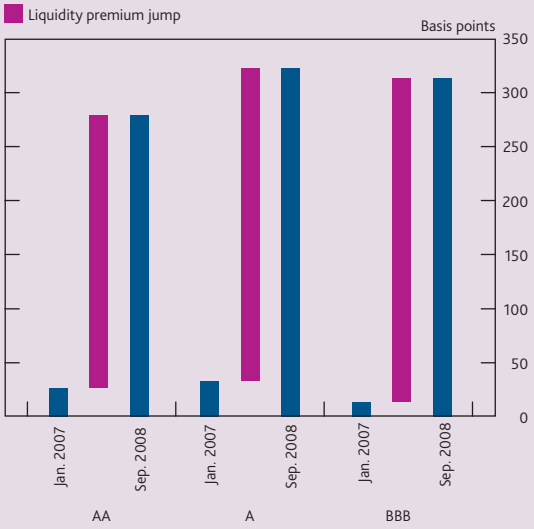


Sources: TriOptima and Bank calculations.

leverage requirements may be less willing to hold or absorb large positions of low risk-weighted assets, which would tend to reduce market liquidity. The impact of reduced market liquidity would need to be balanced against the benefits of a more resilient financial sector. For example, liquidity risk was mispriced ahead of the crisis resulting in artificially low liquidity premia, creating an illusion of liquidity. This had two consequences: first, asset prices were too high. Second, though yields were low, risk weights and therefore capital requirements were also low, which encouraged large inventory holdings. So, when liquidity evaporated and yields jumped (**Chart D**), dealers left with large inventories faced large losses with insufficient capital to absorb them. As a result, they precipitously withdrew from market-making activities (**Chart E**), which likely increased liquidity premia even more. A higher capital requirement may incentivise firms to move away from large inventory holdings in low risk-weighted assets, leaving investment banks less vulnerable to sharp changes in their valuation in times of stress. Discouraging large inventories may consequently smooth the size of inventories, and bid-offer spreads, over the cycle. This could have beneficial financial stability effects. But such benefits would need to be balanced against potentially unwelcome unintended consequences on market liquidity.

Overall, investment banks face risks — modelling risk and uncertainty — that a leverage ratio could be well suited to address. Though their current business model might be disrupted by a binding leverage ratio, the evidence suggests that some investment banks can operate profitably at lower levels of leverage, and they are also able to adapt their business models.

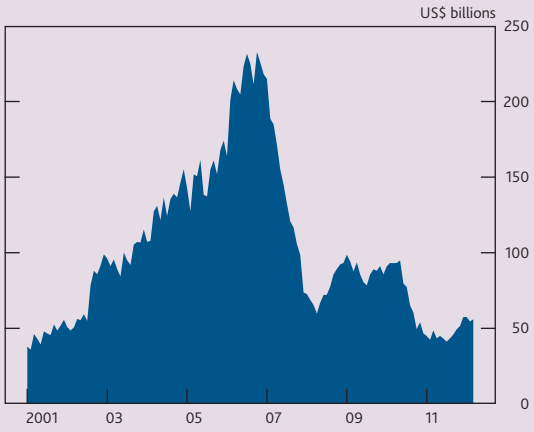
Chart D Estimated liquidity premia for US corporate bonds[a][b]



Sources: Citigroup, JPMorgan, Markit, Moody's and Bank calculations.

(a) Liquidity premia are the difference between estimated spread due to default risk and observed spreads on option-free five-year bonds in the USD iBoxx index.
(b) The January 2007 spread due to default risk is based on the 25-year default and loss experience of corporate bonds. The September 2008 spread due to default risk is based on the five-year loss experience from 1931–35.

Chart E US primary dealers' inventories[a]



Source: Bloomberg.

(a) Dealer inventories represent US primary dealer positions in high-yield and investment-grade US corporate bonds, commercial paper, non-agency RMBS and non-agency CMBS with remaining maturity greater than one year.

(1) The charts show US investment banks only as large investment banks in Europe were part of universal banks.
(2) Banks' unlevered beta using the Capital Asset Pricing Model.

Pillar 2 interactions

As mentioned in Chapter 2, the PRA conducts regular supervisory reviews of individual firms to ensure that they have sufficient capital to support their risks ('Pillar 2' review). The two main areas that the PRA considers are risks that are either not captured, or not fully captured, under the Pillar 1 framework (eg interest rate risk in the banking book), and risks to which the firm may become exposed over a forward-looking planning horizon. If a Pillar 2 review suggests that a firm is insufficiently capitalised against such risks, the PRA can add on further minimum and/or buffer capital requirements to a firm.

To the extent that components of Pillar 2 capital charges are related to identifying additional or higher risks relating to assets included in the leverage exposure measure, such as interest rate risk in the banking book, these are tantamount to an increase in risk-weighted assets. Since the leverage ratio is defined by reference to total exposures, and not the specific risks pertaining to them, an increase in exposures' measured risk should not increase the leverage requirement.

Some aspects of Pillar 2 charges may, however, reflect risks related to exposures that are not included in the leverage exposure measure, for example pension risks. These aspects could be accompanied by a Pillar 2 leverage ratio add-on. But this would need to be balanced against the desire to keep the leverage ratio framework relatively simple.

Question 3 Do you agree with the advantages and disadvantages of symmetry between the leverage ratio framework and the risk-weighted ratio? In particular as they relate to:

- including a minimum requirement and buffers analogous to the risk-weighted framework;
- establishing a leverage conservation buffer in proportion to the risk-weighted buffer;
- eligible capital;
- the level of application; and
- the scope of firms to which the framework is applied.

Question 4 What are your views on the remaining design elements discussed in Chapter 3, in particular regarding the interaction between Pillar 2 and the leverage ratio, including for pension risks, and transitional arrangements, including coverage of only the large UK banks and building societies?

Question 5 What are your views on the impact on different business models of a 'baseline' requirement in steady state?

4 Supplementary leverage ratio

Global systemically important banks (G-SIBs) and ring-fenced banks (RFBs) will be subject to higher risk-weighted capital requirements in the form of buffers that extend the capital conservation buffer. Taking symmetry between the leverage and the risk-weighted framework as a starting point would imply that G-SIBs and RFBs also meet a supplementary leverage ratio in the form of a buffer. In addition, symmetry would also imply that the relationship between the minimum and the supplementary leverage ratio would be the same as that between the relevant risk-weighted buffer and the risk-weighted requirement. This chapter considers to what extent such a supplementary leverage ratio would be desirable for G-SIBs and RFBs.(1)

As set out in Chapter 2, the risk-weighted ratio provides an assessment of risk that can be measured using historical data. The leverage ratio aims to mitigate model risk and provide resilience against unforeseeable shocks. As such, the supplementary leverage ratio would make G-SIBs and RFBs more resilient to some risks. As discussed in Chapter 3, symmetry might also be desirable so as not to undermine the usability of buffers in the risk-weighted regime: relatively smaller leverage buffers would mean that a firm bound by the leverage ratio would reach its minimum requirement relatively sooner, which could undermine a firm's ability to conserve capital before breaching its minimum requirement. A symmetric approach would result in a relatively simple and transparent approach to designing the leverage ratio framework.

More generally, not varying the leverage ratio alongside the risk-weighted ratio could have two consequences:

- First, it could change the relative impact of the leverage ratio and the risk-weighted ratio **across firms**. For example, if G-SIBs and RFBs were not subject to a supplementary leverage ratio, those firms bound by the minimum and conservation buffer leverage ratio components would not be bound by the higher G-SIB/RFB risk-weighted buffers. So they would not be subject to stricter requirements than other non-systemic firms that are also bound by the 'baseline' leverage ratio.

- Second, if no supplementary leverage ratio were imposed, firms' incentives with regard to **asset allocation** might be affected. Intuitively, risk weights are intended to 'tax' risky assets. So the risk-weighted buffers for G-SIBs and RFBs would make high-risk weighted assets less attractive. Firms might then invest relatively more in low risk-weighted assets, decreasing their average risk weight until it is equal to the lower critical risk weight. In the case of RFBs, for example, this could create a homogenous sector with concentrated exposures to similar low risk-weighted asset classes.

Global systemically important banks

As part of the Basel III capital framework, G-SIBs will be subject to higher risk-weighted requirements. These buffer requirements vary from 1% to 3.5% CET1 capital depending on the bank's G-SIB 'score'. The rationale for this surcharge is to lean further against some of the market failures discussed in Chapter 2: first, to make these banks safer because their distress or failure is particularly associated with negative effects on the wider economy; and, second, to reduce moral hazard created by their systemic importance, such as funding cost advantages caused by perceived implicit subsidies.(2)(3)

Making G-SIBs safer would generally include increasing resilience against those risks the leverage ratio guards against. This might not require a supplementary leverage ratio if G-SIBs were thought to be relatively more resilient, or less exposed, to model risk, unforeseeable shocks, and the susceptibility of excessive balance sheet stretch than other banks. But this is unlikely to be the case. It would be reasonable to judge that their higher organisational and operational complexity and their systemic importance would, if anything, make them more susceptible to model risk and unforeseeable shocks. G-SIBs typically use multiple models across different asset classes and risk types.

If the leverage ratio were not increased in response to the higher risk-weighted requirements, moral hazard might also not be adequately dealt with. Without increasing the leverage ratio, G-SIBs bound by the minimum and conservation buffer leverage ratio components would face no additional capital requirements from the higher risk-weighted buffers applying to them. As a result, these firms could operate at the same levels of leverage as non-systemic competitors but enjoy the potential funding cost advantages and other benefits that come from perceived implicit subsidies. There would, therefore, be no additional capital constraint to address moral hazard for these banks.

A corollary of the above is that it might become attractive for G-SIBs to decrease their average risk weights if there were no supplementary leverage ratio. This is because a G-SIB bound by the leverage ratio would not be subject to stricter requirements than other firms, whereas those bound by the risk-weighted ratio would be. This change in risk weights might be attractive to individual firms, but if many reacted in a similar way over time, it might entail that only very few G-SIBs would actually be subject to stricter requirements than non-systemic firms. At the same time, some of the low

(1) As part of CRD IV/CRR, HM Treasury has designated the PRA with the authority to identify 'other systemically important institutions' in the United Kingdom, which could in the future have implications for the range of firms to which the imposition of a supplementary leverage ratio could be desirable.
(2) See for example, BCBS (2013), Alfonso *et al* (2014), IMF (2014) and Acharya *et al* (2013).
(3) International initiatives are in train to ensure that systemic firms can be resolved without access to taxpayers' funds. These initiatives are expected to reduce implicit subsidies.

risk-weighted assets G-SIBs might invest in, such as inter-bank loans and derivatives, tend to increase interconnectedness in the financial system. Creating these incentives does not appear to be desirable from a system-wide perspective.

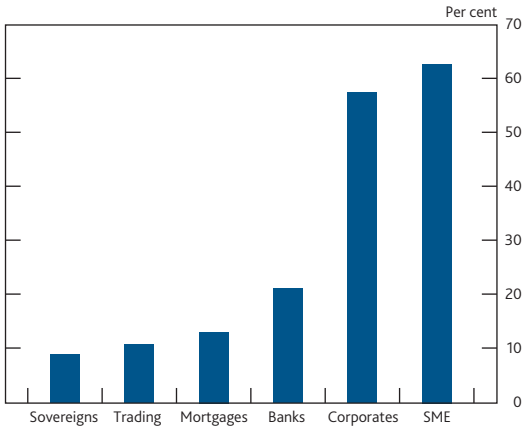
On balance, the FPC is minded to believe that G-SIBs are particularly exposed to the risks that the leverage ratio seeks to address, and that not requiring a symmetrical supplementary leverage ratio would create undesirable consequences.

Ring-fenced banks

The Financial Services (Banking Reform) Act 2013 established a new ring-fencing regime for certain banking activities to be implemented from 2019. The objective of this regime is to ensure the continuity of the provision of core financial services, including deposit-taking in the United Kingdom. The extent and detail of the regime will be set out in secondary legislation made by the Treasury and rules made by the PRA. This process is now under way.

As a result of ring-fencing, RFBs' asset base is likely to be composed to a significant extent of residential mortgages, which can carry very low risk weights for firms with internal model approval (**Chart 5**). Some banks are also likely to include their small and medium-sized enterprise (SME) and corporate lending activities. By requirement, they will be less exposed to the complex intra-financial risk associated with investment banking.

Chart 5 Average modelled risk weights on different asset classes for UK banks and building societies(a)



Source: Regulatory returns.

(a) UK solo-entities as of 2013 Q3.

In addition to the rules being designed by the PRA, RFBs will be subject to additional risk-weighted capital buffers.(1) Symmetry might suggest also imposing a supplementary leverage ratio in order to make RFBs more resilient to model risk and unforeseeable shocks.

However, similar to building societies, RFBs with low risk-weighted assets may be subject to a lower degree of model risk than more complex firms. A supplementary leverage ratio would most likely affect RFBs that largely hold mortgages and have received internal model approval. Arguably, supervisors may be more confident that low risk weights on residential mortgages reflect genuinely low underlying risk, because of the housing collateral. Supervisory review of risk-weight models and stress tests of mortgage portfolios could give further assurance that risk-weighted capital requirements are adequate, allowing for a more targeted approach to addressing specific instances of model risk for different mortgage portfolios. An alternative to the supplementary leverage ratio might therefore be to rely on these other mitigants of model risk to give confidence that RFBs with high leverage are genuinely low risk.

But even relatively simple, low risk-weighted mortgages may still be subject to model risk. Precisely because of their low default history, there is little ground on which to judge whether or not the data mask considerable tail risk. Although there are circumstances when there are enough individual borrowers to judge that an individual mortgage is relatively less risky than another, there is only limited time-series data about the absolute riskiness of an individual mortgage, let alone that of entire portfolios concentrated in similar mortgages. The PRA assesses this 'concentration risk' as part of its Pillar 2 review — but this assessment cannot fully account for risks from unforeseeable events.

Moreover, even in the hypothetical absence of model risk, RFBs might still be exposed to unforeseeable shocks. In the absence of a supplementary leverage ratio RFBs might not be made more resilient to these unforeseeable risks than comparable but smaller firms not subject to ring-fencing, which would go against the intentions of lowering the risk tolerance level for RFBs.

A decision not to vary the leverage ratio alongside the higher risk-weighted buffer might also induce RFBs to invest mainly in the lower risk weighted assets of the scope of permissible assets within the ring-fence. On the one hand, this can be seen as consistent with the aim of protecting core deposit-taking activities from risky assets. But on the other hand, the lower risk weighted assets would also be funded with commensurately less capital. So it is not clear that RFBs would necessarily be safer if they invested in low risk-weighted assets. On the contrary, these incentives might create a homogeneous set of RFBs all with concentrated exposures to similar low risk-weighted asset classes, potentially creating a systemic exposure to small, unforeseeable shocks and model risk.

(1) Large building societies, though not covered by the Financial Services (Banking Reform) Act 2013, will also be subject to buffers. They are likely to resemble RFBs with large mortgage exposures, so the considerations in this section might also apply to them.

Box 7 discusses what impact a supplementary leverage ratio might have on RFBs that would likely be affected by it — so called 'narrow' RFBs which predominantly invest in low risk-weighted assets.

On balance, the FPC believes that RFBs are exposed to the risks that the leverage ratio seeks to address, though not necessarily more so than other firms. Consistent with greater resilience for RFBs, a supplementary leverage ratio could be warranted.

Non-ring fenced banks

The higher ring-fencing capital requirements — the supplementary risk-weighted and leverage ratios — would not extend to the portion of the banking group not subject to the ring-fencing provisions. As noted above, banks may respond to a supplementary leverage ratio by transferring more of their real-economy assets with relatively higher risk weights, such as corporate and SME loans, from the non-ring fenced bank to the RFB. This could be beneficial to the extent that it allowed for a more resilient provision of lending across all real-economy sectors. As such, the final shape of RFBs would also have an impact on the non-ring fenced banking entities of a group.

Figure 1 sets out simplified examples of the interaction between the different risk-weighted and leverage ratios within a group.

Box 7
The impact of a supplementary leverage ratio on narrow RFBs

RFBs with a relatively narrow asset base compared to the group's total assets, or those predominantly investing in low risk-weighted assets (so-called 'narrow' RFBs) are more likely to be bound by a supplementary leverage ratio requirement. Those RFBs that are affected could respond to a capital shortfall in different ways. Consistent with the analysis set out in Chapter 2, possible options could include:

- **Increasing their capital base**: This could be done organically (eg by retaining a greater proportion of profits), or by allocating surplus capital from other parts of the group to the RFB. It could also be done by raising capital externally (eg through capital issuance).

- **Diversifying their asset mix**: RFBs could seek to diversify their asset mix in response to a binding ratio. For example, if the risk-weighted ratio binds, RFBs may have incentives to increase the proportion of low risk-weighted assets within the ring-fence (eg low loan to value mortgages). If the leverage ratio binds, RFBs may have incentives to increase the proportion of higher risk-weighted assets within the ring-fence (eg corporate and SME loans). In practice, these incentives would only be one factor in shaping the outcome of ring-fence plans, as these would also depend on more general business considerations.

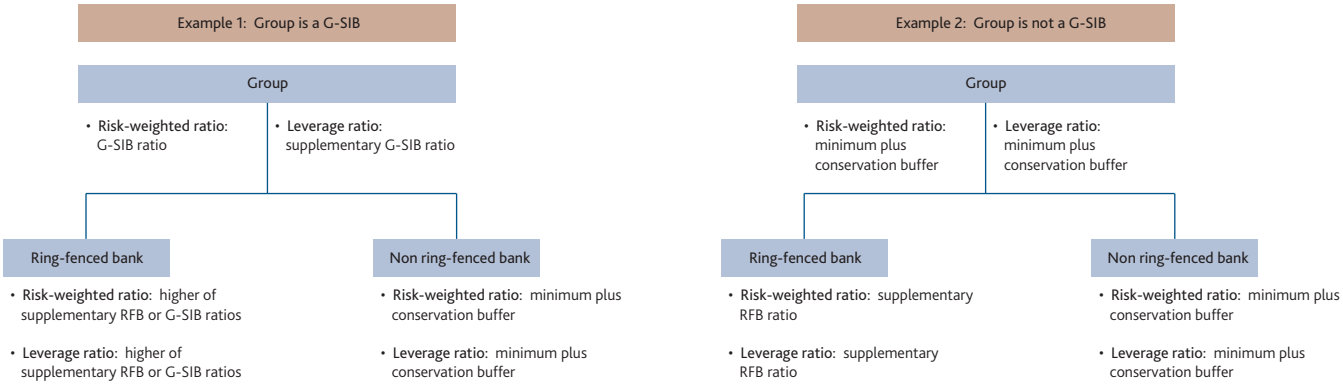
- **Reducing business activities**: RFBs could increase their capital ratios by selling assets or by scaling back certain business activities. Such an option would be undesirable to the extent that it resulted in a reduction in the provision of real economy lending.

If RFBs continue operations with average risk weights below the critical risk weight, they might pass on increased funding costs to consumers, to the extent that competitive pressures will allow. This scenario might be more likely for those firms that have mostly low risk-weighted assets (eg low loan to value residential mortgages). These firms have less scope in deciding the width of their ring-fenced operations and might be less able to adjust to a higher leverage requirement than more diversified firms. Since the width of the ring-fence will also depend on other business considerations, some firms might choose to operate with average risk weights below the critical risk weight.

In practice, RFBs might be expected to diversify their asset mix to operate with an average risk weight near the critical risk weight. Since RFBs will not be established until 2019, firms have scope to organically diversify their asset mix to meet future requirements. This could create incentives for those firms that expect their RFBs to be bound by the leverage ratio to invest relatively more in assets with higher risk weights than mortgages, such as corporate and SME loans. This could be achieved over time by growing high-risk weight lending faster than low risk-weight lending.

Some firms might choose to reduce business activities in an absolute rather than a relative sense — this could include selling assets or stopping certain lending activities altogether. The extent to which this affects the real economy will depend on the extent to which the business foregone by some firms is picked up by others. Overall, the way in which RFBs will address any potential capital shortfalls will depend on their magnitude and the length of transition arrangements. For example, a leverage ratio that creates large capital shortfalls for many firms, combined with a short transition period, would tend to induce the banking system to adjust in a way that is more disruptive to the real economy.

Figure 1 Interaction between supplementary ratios within a banking group



Source: Bank of England.

Question 6 Do you agree with the considerations regarding a supplementary leverage ratio component for G-SIBs and RFBs?

Question 7 Do you agree that it would be desirable to scale up the leverage ratio in proportion to the supplementary risk-weighted buffer for G-SIBs and RFBs, with a presumption of symmetry?

5 Time-varying leverage ratio

This chapter considers the role of a time-varying component of the leverage ratio framework. It sets out the objectives of the FPC's existing powers of Direction over the countercyclical capital buffer (CCB), which is a risk-weighted buffer intended to mitigate those risks to financial stability that vary over time. It then considers the case for introducing the time-varying leverage ratio alongside the existing CCB, so that both measures can be used together, if the latter is activated over the next few years.

The Government previously committed to giving the FPC Direction powers over a time-varying leverage ratio by 2018, subject to a review in 2017. The FPC is of the view that it would be important to have such powers sooner to help mitigate any potential financial stability risks over the next few years.

A time-varying leverage ratio could help the FPC achieve both its objectives. As system-wide risk fluctuates over time, it is desirable for capital requirements, including the leverage ratio, also to vary over time in order to protect and enhance the resilience of the financial system — the FPC's primary objective. A time-varying leverage ratio might also help the FPC dampen the credit cycle, which may contribute both to the FPC's primary objective and to its secondary objective, which is to support the government's economic policy, including its objectives for growth and employment. Varying the risk-weighted CCB alone may not be effective in leaning against the build-up of risks because it would change the relative significance of the leverage ratio in the capital framework, which may result in firms shifting their portfolios towards assets with low risk weights.

The FPC considers that, in most circumstances, it would be desirable to vary the CCB and a leverage ratio in proportion in order to preserve the relationship between the risk-weighted and leverage requirements through the cycle. However, there may be exceptional instances when the use of one of these measures by itself may be more desirable; these are explored in this chapter.

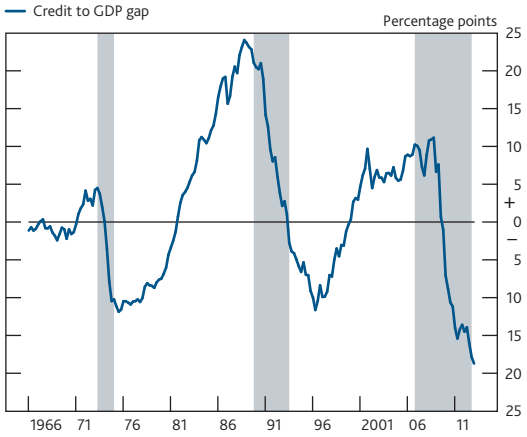
Time-varying risk

Credit cycles — periods of persistent and rapid expansions in bank lending followed by periods of much weaker lending growth — have been a feature of financial systems for as long as data have been collected.(1) Upswings tend to be characterised by low lending spreads and a persistent increase in asset prices. As conditions turn, previous increases in asset prices are often unwound. Banking crises, falling output and rising unemployment are all common in credit cycle downswings.(2) And banking crises have been more frequent in instances when the preceding upswing was larger.(3) These observations suggest that system-wide risks vary over time, in particular with the credit cycle.

Various explanations have been put forward for these trends, notably based on myopic behaviour, changes in expectations about future prospects, changes in uncertainty and distorted incentives and incomplete information of financial market participants.(4) And some studies put bank leverage at the centre of this narrative.(5)

This cyclicality and build-up of system-wide risk occurred prior to the recent crisis in the United Kingdom. For example, the credit to GDP gap (a measure of the credit cycle) increased rapidly in the run-up to the recent crisis before declining rapidly (**Chart 6**). Globally, lending spreads fell significantly, suggesting a rise in risk appetite, before subsequently reversing with the onset of distress, pointing towards a cyclical tendency to misprice risk (**Chart 7**). And this build-up of risks was associated with rapid growth in bank leverage (**Chart 8**).

Chart 6 UK credit-to-GDP gap(a)(b)



Sources: BBA, ONS, Revell, J and Roe, A (1971), 'National balance sheets and national accounting — a progress report', *Economic Trends*, Vol. 310.5, No. 211, May, pages xvi–xvii and Bank calculations.

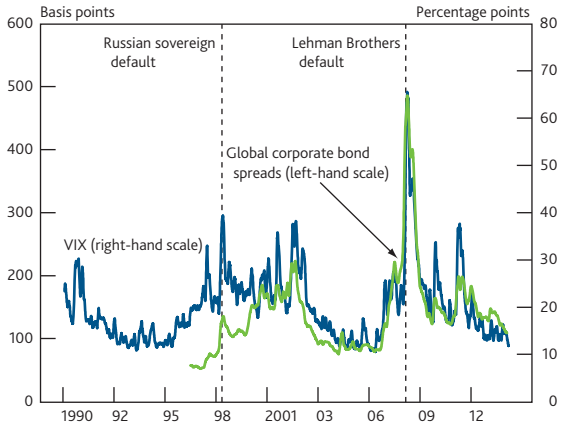
(a) Credit is defined here as debt claims on the UK private non-financial sector. This includes all liabilities of the household and not-for-profit sector and private non-financial corporations' loans and debt securities excluding derivatives, direct investment loans and loans secured on dwellings.
(b) The credit-to-GDP gap is calculated as the percentage point difference between the credit-to-GDP ratio and its long-term trend, where the trend is based on a one-sided Hodrick-Prescott filter with a smoothing parameter of 400,000.

Objectives of the existing countercyclical capital buffer

These factors of time-varying risk suggest a need for time-varying capital requirements to ensure that banks are sufficiently capitalised throughout the economic cycle. Basel III introduced a risk-weighted buffer which the FPC now has at its disposal — the CCB.(6)

(1) See, for example, Aikman, Haldane and Nelson (2014) and Schularick and Taylor (2012).
(2) See, for example, Claessens, Kose and Terrones (2009).
(3) See, for example, Borio and Lowe (2002).
(4) See, for example, Kaufman and Minsky (2008), Aikman *et al* (2014) for a modern manifestation, Allen and Gale (2000) and Bernanke, Gertler and Gilchrist (1999).
(5) See, for example, Adrian and Boyarchenko (2012) and Geanakoplos (2010).
(6) Further information on the CCB is set out in Box 8 of the June 2014 *Financial Stability Report* (Bank of England (2014a)) and in Bank of England (2014b).

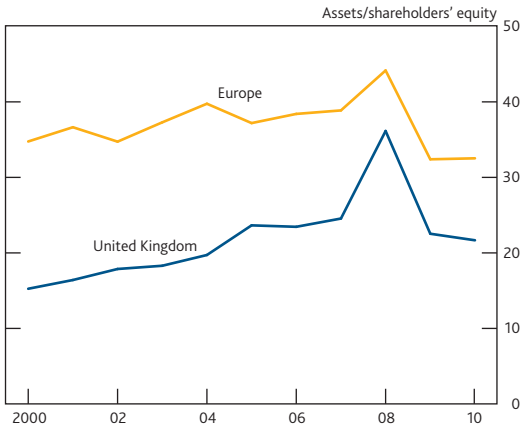
Chart 7 VIX[a] and corporate bond spreads[b]



Sources: Bloomberg, BoA Merrill Lynch and Bank calculations.

(a) The VIX is a measure of market expectations of 30-day volatility as conveyed by S&P 500 stock index options prices. One-month moving average.
(b) 'Global corporate debt spreads' refers to the global broad market industrial spread. This tracks the performance of non-financial, investment grade corporate debt publicly issued in the major domestic and eurobond markets. Index constituents are capitalisation-weighted based on their current amount outstanding. Spreads are option adjusted, (ie they show the number of basis points the matched-maturity government spot curve is shifted in order to match a bond's present value of discounted cash flows). One-month moving average.

Chart 8 Balance sheet leverage multiples for UK and EU banks[a][b]



Sources: Capital IQ and Bank calculations.

(a) Average total assets to total equity ratios (weighted by total assets) for the following UK banks: Barclays, HSBC, Lloyds Banking Group and Royal Bank of Scotland.
(b) Average total assets to total equity ratios (weighted by total assets) for the following European banks: Banco Santander SA, BNP Paribus SA, Commerzbank AG, Credit Agricole, Credit Suisse Group, Deutsche Bank AG, Dexia SA, Royal Bank of Scotland Holdings N.V., Société Générale, UBS AG and Unicredit SpA.

The CCB serves two purposes:

- to enhance the ability of the banking system to withstand risks which vary over time, so that it is able to maintain its core economic functions in a system-wide stress; and

- to reduce lending in the upswing of the cycle and cushion it in the trough, which can help to achieve both of the FPC's objectives — to protect and enhance the resilience of the UK financial system and to support the government's economic policy, including its objectives for growth and employment.

These purposes suggest that the CCB could prove useful in reducing the costs associated with the credit cycle. However, there are reasons why the CCB may be insufficient if it is the only 'aggregate' time-varying instrument that applies across the system that is available to the FPC.

Rationale for a time-varying leverage requirement

The leverage ratio could bolster the CCB's ability to meet the purposes described above. Just as a leverage ratio requirement could enhance the ability of the banking system to withstand risks which do not vary over time, it may also increase resilience to those risks which vary over time (the first purpose).

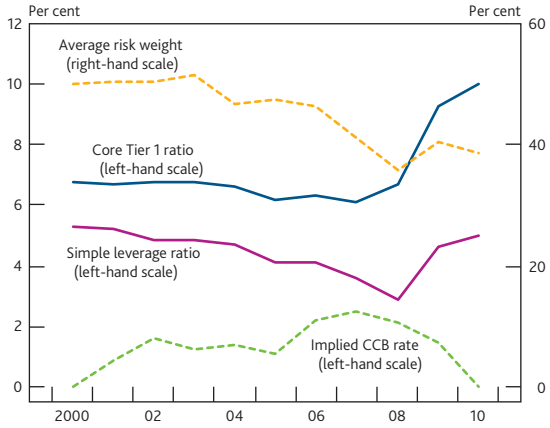
Chapter 2 notes that the leverage ratio could play a complementary role to that of the risk-weighted capital ratio in the capital framework — together they determine the level of resilience to risks that is chosen by regulators for banks and the banking sector. As such, if the authorities perceive the probability of future financial instability to have increased in the upswing of a credit cycle, symmetry would imply that the risk-weighted and the leverage requirement be tightened in a way that leaves the relationship, and thus their respective roles in delivering the desired level of resilience, unchanged.

A departure from symmetry may create an incentive for banks to adjust their portfolios. For example, consider a scenario in which banks' balance sheets are increasing rapidly and the FPC becomes concerned with growing risks across the system. In response, the Committee may activate or increase the CCB in order to safeguard banking sector resilience. But such a measure by itself may not ensure that banks' balance sheets are resilient to these growing risks without an equivalent leverage measure, as the banks could continue to increase lending to, and invest in, low risk-weighted assets.

Evidence from the United Kingdom highlights the potential benefits from using a time-varying leverage ratio in addition to the CCB. **Chart 9** shows UK banks' risk-weighted and leverage ratios in the run-up to the financial crisis. Risk-weighted ratios remained fairly steady during this period while average risk weights and leverage ratios were declining. Had the CCB been activated during this period, banks might have responded to it by decreasing their average risk weights further to meet the additional buffer requirement. For example, they may have increased their holdings of assets that received relatively low risk weights. An example of an activity that was subject to low capital requirements before the financial crisis is trading activity, which turned out to be subject to considerable model risk. The CCB alone might not have been sufficient to provide greater resilience against the risks associated with investing in such low risk-weighted assets.

The second objective of the CCB is to reduce lending in the upswing of the cycle and cushion it in the trough. As discussed above, an increase in the CCB on its own may have little

Chart 9 UK banks' risk-weighted capital and leverage ratios(a)(b)(c)(d)



Sources: BBA, ONS, Revell, J and Roe, A (1971), 'National balance sheets and national accounting — a progress report', *Economic Trends*, Vol. 310.5, No. 211, May, pages xvi–xvii, PRA regulatory returns, published accounts and Bank calculations.

(a) Major UK banks' aggregate core Tier 1 capital as a percentage of their aggregate risk-weighted assets. The major UK banks peer group comprises: Abbey National (until 2003); Alliance & Leicester (until 2007); Bank of Ireland (from 2005); Bank of Scotland (in 2000 only); Barclays; Bradford & Bingley (from 2001 until 2007); Britannia (from 2005 until 2008); Co-operative Banking Group (from 2005); Halifax (in 2000 only); HBOS (from 2001 until 2008); HSBC; Lloyds TSB/Lloyds Banking Group; National Australia Bank (from 2005); Nationwide; Northern Rock (until 2008); Royal Bank of Scotland; and Santander (from 2004).
(b) Simple leverage ratio calculated as aggregate peer group equity over aggregate peer group assets.
(c) Average risk weight calculated by dividing aggregate peer group risk-weighted assets by aggregate peer group assets.
(d) The implied CCB rate is the level of the CCB implied by the size of the credit to GDP gap according to the CRD IV 'buffer guide' (based on Basel III). The buffer guide maps the credit to GDP gap onto a CCB rate, so that the guide is 0% when the credit to GDP gap is below 2%, between 0% and 2.5% when the credit to GDP gap is between 2% and 10% and 2.5% when the credit to GDP gap is higher than 10%. The year-end credit to GDP gap is used to derive the implied CCB rate for each year.

impact on banks' exposures to low risk-weighted assets. But these assets may play an important role in the credit cycle and their contribution to systemic risk may not be fully factored into risk weights which, for example, do not take account fully of default correlations across banks.

Although there is limited evidence on the extent to which growth in particular exposure classes contributes to system-wide risk, some recent empirical evidence finds that residential mortgage lending is a more important pre-cursor of financial crises than corporate lending, despite generally attracting lower risk weights.(1) Likewise, intrafinancial system lending, to which low risk weights are typically assigned, accounted for a significant portion of bank losses during 2007–08 and the high correlation amongst banks' exposures to sovereigns was a serious concern during the euro-area sovereign crisis.

More generally, some studies suggest that cycles in bank leverage and in credit are closely linked, reinforcing the argument that a time-varying leverage ratio instrument is needed to lean against time-varying system-wide risk.(2)

Potential departures from symmetry

As noted above, symmetry would imply that the time-varying leverage buffer be varied alongside the risk-weighted buffer. However, there may be exceptional instances when the use of only one these measures by itself may be desirable and more appropriate. This section considers two possible examples of such circumstances, in the context of an upswing in the cycle.

Scenario 1 Banks' balance sheets are increasing rapidly and the expansion is concentrated in low risk-weighted assets.

In this scenario, the FPC may be concerned about risks developing in certain sectors which attract low risk weights, such as residential mortgage lending, and the increased vulnerability of firms as their balance sheets are stretched (ie they are vulnerable to small shocks).

In this case, raising the CCB by itself may not be the most efficient policy. Highly leveraged firms will, by definition, have relatively low average risk weights. Increasing the CCB is equivalent to increasing all risk weights proportionately and so firms with higher average risks will face a higher absolute increase in their regulatory capital charge, as opposed to the low average risk weight firms that the policy intends to capture. In this case, increasing the leverage ratio would be a more targeted response.

Alternative instruments in situations like this, such as sectoral capital requirements (SCRs), might be a superior alternative to varying the leverage ratio requirement. But there may be reasons why SCRs may not be a feasible alternative. For example, the FPC may not have the Direction powers to require SCRs for the necessary sector. It currently has the power to direct SCRs for residential property, commercial property and intrafinancial exposures, but not other sectors, for example, exposures to sovereign or corporate debt.(3) Moreover, there may be a lengthy lead time before SCRs may be used in certain circumstances (for example, the period of time before the tool can be implemented due to European legal and procedural requirements or because of the time required to assess the appropriate calibration of the instruments). These considerations may make it desirable to increase leverage requirements in the first instance.

Scenario 2 Banks' balance sheets are increasingly concentrated in high risk-weighted assets

In this scenario, the FPC may be concerned about risks developing in certain sectors which attract high risk weights, such as corporate or SME lending (as suggested by **Chart 5**). The FPC may want to ensure that banks' exposures to these sectors are capitalised sufficiently and that credit provided is being correctly priced.

In this case, raising the leverage ratio may not be the most efficient policy as firms with the lowest average risk weights will be affected relatively more than those with the highest

(1) For example, Büyükkarabacak and Valev (2010).
(2) For example, Geanakoplos (2010) and Kaufman and Minsky (2008).
(3) Alternatively, the FPC could make use of recommendations.

average risk weights. For firms that are constrained by risk-weighted capital requirements, activating the CCB on its own may be a more targeted policy to make investment in risky assets less attractive.

In this scenario, a risk-shifting argument would suggest that increasing risk-weighted requirements relative to leverage requirements may actually incentivise firms to change their investment portfolio allocation towards a greater proportion of lower risk assets. This would reinforce the policy objective in this scenario.

As in the case with the first scenario, SCRs might be the more appropriate instrument. However, in the case of assets which receive a high risk weight, the FPC may not have the necessary Direction powers given the scope for macroprudential flexibility in CRD IV/CRR. And, in the case of sectors for which it does have powers, the same considerations about expediency and simplicity of applying time-varying leverage requirements relative to SCRs would remain.

Operationalising a time-varying leverage ratio

While static risk-weighted requirements apply to UK firms' global exposures, the CCB rate set by the FPC applies to UK exposures only. In the same way, foreign authorities will set national CCB rates that will, in most cases, apply to UK banks' overseas exposures.(1) As such, banks that operate internationally will face a CCB that consists of the weighted average of the different CCB rates applied to their geographical exposures.

To deliver a symmetrical approach with the CCB, an option could be for a time-varying leverage ratio to adopt the CCB's approach to geographical exposures. More specifically, the proportionate increase in the time-varying leverage ratio would be determined by: (i) the FPC's CCB rate for UK exposures; and (ii) the share of a firm's UK exposures relative to its total exposures. This proportionate variation would be extended whenever the FPC reciprocates the CCB rates for foreign exposures. This approach would ensure full symmetry between both time-varying measures, but would mean that firms would be subject to different time-varying leverage ratios, potentially somewhat reducing the relative simplicity of the leverage ratio as an instrument.

Question 8 Do you agree with the desirability of being able to vary the leverage ratio requirement in the same way as risk-weighted requirements can be varied through the countercyclical buffer?

Question 9 Do you agree that, as a guiding principle, the leverage ratio should vary in proportion to the risk-weighted countercyclical buffer?

(1) It is expected that CCB decisions will usually be reciprocated.

6 Allocation of responsibilities

This chapter considers the allocation of responsibilities over the leverage ratio framework.

The FPC has two main sets of powers under the Bank of England Act 1998. The first is a power to make Recommendations, which can be on a 'comply or explain' basis when made to the PRA and Financial Conduct Authority (FCA). The second is a power to give Directions to apply or adjust specific macroprudential instruments. Directions act as binding requirements on the PRA or FCA to implement the specified macroprudential measure as soon as reasonably practicable.

The Government previously committed to giving the FPC Direction powers over a time-varying leverage ratio by 2018, subject to a review in 2017. The FPC is of the view that it would be important to have such powers sooner to help mitigate any potential financial stability risks over the next few years. This would also allow for the CCB and time-varying leverage ratio to be used together, if the former is activated over the next few years.

More generally, the FPC is of the preliminary view that it should be granted powers of Direction over all components of the leverage ratio framework not determined under EU legislation. So the Direction powers would cover the design and setting of the minimum, conservation buffer, supplementary and time-varying leverage ratio components. The design and setting of these components are integral to system-wide financial stability, and therefore of relevance to the FPC. Direction powers over these components would have three main advantages:

- **Coherence**: Direction powers would allow for a coherent approach to setting and implementing the leverage ratio framework in the United Kingdom in anticipation of potential international standards, with the FPC overseeing all aspects of the framework.

- **Accountability**: given their statutory force, Direction powers are associated with stronger Parliamentary scrutiny and accountability; they also require the FPC to maintain a Policy Statement on their use. As such, Direction powers over all aspects of the leverage ratio framework and the associated Policy Statement could help to inform public and financial market expectations over how the FPC is likely to act on the leverage ratio.

- **Timeliness**: Direction powers would allow the FPC to set/adjust the leverage ratio and target vulnerabilities in a timely and expeditious manner. In contrast to Recommendations, Directions require the PRA/FCA to act as soon as reasonably practicable. This would be of particular value to the time-varying component of the leverage ratio framework.

Granting Direction powers to the FPC over all aspects of the leverage ratio framework would also be consistent with the recommendation of the Parliamentary Commission on Banking Standards (PCBS) that 'the FPC should be given the duty of setting the leverage ratio'.(1)

Scope of firms over which the Direction powers would apply

The preliminary view of the Committee is that the scope of these Direction powers should apply to the set of firms that are currently subject to the set of existing minimum and buffer risk-weighted requirements set out in CRD IV/CRR.(2) Given the complementary roles of the risk-weighted ratio and the leverage ratio, there is merit in applying both ratios consistently across all firms. As noted in Chapter 3, in anticipation of possible EU-wide leverage ratio rules, the FPC is considering limiting the leverage ratio framework to a subset of firms as part of transitional arrangements. But the Committee believes that a wider scope could be necessary for its Direction powers, in the event that a robust EU-wide leverage ratio framework does not materialise.

Timing of allocation powers

The initial view of the Committee is that the Direction powers over the leverage ratio framework should apply as soon as practicable. This would allow for the transitional arrangements for the minimum and conservation buffer components of the leverage ratio to be introduced in a timely manner. Any supplementary leverage ratio would be introduced at the same time as the relevant supplementary risk-weighted ratio. For example, RFBs would not be subject to a supplementary leverage ratio before they are subject to the higher risk-weighted buffer.

(1) PCBS (2014).
(2) This would cover all PRA-regulated firms and a subset of FCA-regulated firms.

7 Cost-benefit analysis considerations

This chapter sets out high-level considerations of the costs and benefits of the leverage ratio framework discussed in this consultation paper. This complements the analysis of the costs and benefits of the different components of the leverage ratio framework discussed in the previous chapters. The FPC intends to develop further this cost-benefit analysis (CBA) as part of its final review of the leverage ratio later this year, based on a quantitative impact study which will be carried out during the consultation period.

As set out in the terms of reference, the determination of the appropriate numerical value of the leverage ratio is outside the scope of the leverage review.

Rationale of the leverage ratio

As noted in Chapter 2, imposing a leverage ratio alongside the existing regulatory capital regime increases firms' resilience to model risk and unforeseeable events. Together, the capital framework aims to overcome market failures, including the impact of negative externalities, moral hazard and information asymmetries.

Estimating the costs and benefits of higher capital requirements

Higher capital requirements can have both costs and benefits for the economy. There is an extensive body of literature on the economic impact of higher capital requirements. The benefits of higher capital requirements arise typically from making the financial system more resilient, thereby reducing the probability and severity of financial crises. The costs may arise if firms pass on any increase in their funding costs to households and non-financial firms, which may reduce consumption and investment in turn. In general, these studies find that the net benefits of higher capital requirements are positive over a wide range.(1)

Estimating the net benefits is subject to considerable uncertainty. This is particularly the case for estimating the marginal benefits of policies aimed at enhancing financial stability, which is subject to more uncertainty than estimates of the marginal costs to financial intermediation. The relative infrequency of systemic crises within any particular country limits the number of data points to quantify the relationship between regulatory measures and the probability of crises. As such, there are challenges in estimating the benefits of a leverage ratio framework, which has the aim of making the financial system more resilient to unquantifiable uncertainty arising from model risk and unforeseeable events. Despite these challenges, it is essential to consider fully the benefits (both qualitative and quantitative) as well as the costs of higher capital requirements due to the large declines in economic output associated with systemic banking crises.(2)

Additional considerations around the design of the leverage ratio

There are a number of specific considerations related to a CBA of a leverage ratio framework, which the Committee intends to consider as part of its final review.

In principle, the introduction of a leverage ratio would only result in additional capital when the capital required by the existing risk-weighted capital regime is insufficient. This, in turn, depends on the calibration of both the risk-weighted and leverage ratios.

But, in practice, the leverage ratio will have a greater impact on low risk-weighted portfolios, such as mortgages with capital requirements determined by the so-called internal ratings-based approach, reverse repo and derivative positions and sovereign bonds. Similarly, this may reduce firms' demands to hold such assets, resulting in higher costs for those borrowers or reduced intermediation. This, in turn, could affect underlying markets (eg short-term money markets and government bond repo markets) and potentially make them less efficient at the margin. The final review will consider these issues in more detail, including any potential impact on sterling markets and the implementation of monetary policy.

These potential costs would need to be balanced against the benefits of a reduction in the probability and severity of systemic crises and a more sustainable provision of lending. Moreover, any short-term frictions could be overcome in the medium-term as firms adjust to changes in the underlying markets. The Committee intends to assess the considerations outlined above as part of its CBA.

Question 10 Do you have any views on the cost-benefit analysis considerations?

(1) See, for example, BCBS (2010a) and PRA (2013d).
(2) See, for example, Reinhart and Rogoff (2009) for an exposition of the economic costs of banking crises.

8 Feedback on the Consultation Paper

The FPC would welcome comments from interested stakeholders — including Parliament, firms, market participants, academics, foreign regulators and other interested parties — on the different elements of the leverage review covered in this consultation paper by 14 August 2014. Although the FPC is keen to elicit views on all aspects of this paper, it particularly welcomes feedback on the following questions:

Question 1 Do you agree that the leverage ratio plays a complementary role to risk-weighted ratios and stress tests in assessing capital?

Question 2 Do you agree with the considerations regarding potential alternatives to the leverage ratio?

Question 3 Do you agree with the advantages and disadvantages of symmetry between the leverage ratio framework and the risk-weighted ratio? In particular as they relate to:

- including a minimum requirement and buffers analogous to the risk-weighted framework;
- establishing a leverage conservation buffer in proportion to the risk-weighted buffer;
- eligible capital;
- the level of application; and
- the scope of firms to which the framework is applied.

Question 4 What are your views on the remaining design elements discussed in Chapter 3, in particular regarding the interaction between Pillar 2 and the leverage ratio, including for pension risks, and transitional arrangements, including coverage of only the large UK banks and building societies?

Question 5 What are your views on the impact on different business models of a 'baseline' requirement in steady state?

Question 6 Do you agree with the considerations regarding a supplementary leverage ratio component for G-SIBs and RFBs?

Question 7 Do you agree that it would be desirable to scale up the leverage ratio in proportion to the supplementary risk-weighted buffer for G-SIBs and RFBs, with a presumption of symmetry?

Question 8 Do you agree with the desirability of being able to vary the leverage ratio requirement in the same way as risk-weighted requirements can be varied through the countercyclical buffer?

Question 9 Do you agree that, as a guiding principle, the leverage ratio should vary in proportion to the risk-weighted countercyclical buffer?

Question 10 Do you have any views on the cost-benefit analysis considerations?

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