

January 2013

The Financial Policy Committee's powers to supplement capital requirements

A Draft Policy Statement



BANK OF ENGLAND





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In June 2010, the Chancellor of the Exchequer set out a plan for fundamental changes to the system of UK financial regulation. In July 2010 and February 2011, the Government published consultation documents on the proposed changes, and in January 2012 introduced the Financial Services Bill to Parliament, which received Royal Assent in December 2012. The legislation establishes a Financial Policy Committee (FPC). The responsibility of the Committee 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, and, subject to that, supporting the economic policy of Her Majesty's Government, including its objectives for growth and employment.

The legislation requires the statutory FPC to prepare and maintain a written statement of the general policy that it proposes to follow in relation to the exercise of its powers of Direction. In September 2012, HM Treasury issued a consultation document on the Committee's powers of Direction, suggesting that the FPC might be responsible for setting the countercyclical capital buffer and have a power of Direction over sectoral capital requirements. The Government asked the FPC to publish a draft policy statement for these tools in time to be considered alongside Parliament's scrutiny of the associated secondary legislation. This document, produced under the guidance of an interim FPC established by the Bank's Court of Directors in February 2011, meets that request.

The interim Financial Policy Committee:

Mervyn King, Governor

Paul Tucker, Deputy Governor responsible for Financial Stability

Charles Bean, Deputy Governor responsible for Monetary Policy

Andrew Bailey, Head of the Prudential Business Unit of the Financial Services Authority

Adair Turner, Chairman of the Financial Services Authority

Alastair Clark

Michael Cohrs

Paul Fisher

Andrew Haldane

Robert Jenkins

Donald Kohn

Martin Wheatley, Head of the Conduct Business Unit of the Financial Services Authority and CEO Designate of the Financial Conduct Authority, participates in a non-voting capacity, and will become a full member of the statutory FPC. A representative of the Treasury also participates in a non-voting capacity.

This document was finalised on 10 January 2013 and, unless otherwise stated, uses data available as at 30 November 2012.

Contents

	Executive summary	5
1	Introduction	7
2	Description of the tools	9
2.1	What is the countercyclical capital buffer and what are sectoral capital requirements?	9
2.2	To whom will the tools apply?	9
2.3	To which exposures will the tools apply?	9
2.4	How will decisions on these tools be co-ordinated with overseas regulators?	11
2.5	How do these tools fit with the rest of the regulatory framework?	12
2.6	How will the FPC's decisions on macroprudential tools be communicated and enforced?	12
3	Impact of the tools on financial stability and growth	14
3.1	Direct impact on resilience	14
3.2	Indirect impact on resilience	15
3.3	Impact on the level of GDP: cycle and trend	17
Box 1	The impact of recent capital measures	18
4	Indicators for adjusting the tools	21
4.1	High-level considerations	21
4.2	Core indicators for the countercyclical capital buffer	23
Box 2	Credit-to-GDP indicators and the Basel III guidance	28
4.3	Core indicators for sectoral capital requirements	32
Box 3	Indicators and the current crisis: a case study	36
5	Conclusion	37
	References	41
	Glossary	44

The Financial Policy Committee's powers to supplement capital requirements

A draft policy statement prepared under the guidance of the interim Financial Policy Committee.

Executive summary

The Financial Services Act 2012 introduces legislation to put the Financial Policy Committee (FPC) on a statutory footing. The primary responsibility of the FPC will be '*protecting and enhancing the resilience of the UK financial system*'. This responsibility relates chiefly to the '*identification of, monitoring of, and taking of action to remove, or reduce, systemic risks*'. But the FPC's task will not be to achieve resilience at any cost. Its actions must not, in the language of the legislation, have '*a significant adverse effect on the capacity of the financial sector to contribute to the growth of the UK economy in the medium or long term*'. The legislation provides that, subject to achieving its primary objective, the FPC must also support '*the economic policy of Her Majesty's Government, including its objectives for growth and employment*'.

The FPC will have two main powers. The first is a power to make *Recommendations*. It can make Recommendations to anybody. But the FPC has a special power to make Recommendations on a comply or explain basis to the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA). This document is not about that first set of powers. The second is a power to *Direct* those regulators to adjust specific macroprudential tools. The Government is proposing to make the FPC responsible for decisions on the countercyclical capital buffer (CCB) applied to certain financial institutions in the United Kingdom, a tool due to be implemented in the European Union via the forthcoming revised Capital Requirements Directive and Regulation (CRD4/CRR). It also plans to give the FPC Direction power, under the new legislation, over sectoral capital requirements (SCRs). In addition, the Government intends to provide the FPC with Direction power over a time-varying leverage ratio tool, but no earlier than 2018. These tools are primarily intended to tackle cyclical risks, such as those arising from unsustainable levels of leverage, debt or credit growth.

There is a statutory requirement for the FPC to prepare and maintain a general statement of policy for all the Direction powers it is given under the new legislation. This is a draft of that Policy Statement. It describes the CCB and SCRs, the

likely impact of using these tools on financial stability and growth, and the circumstances in which the FPC might expect to use each tool.

The CCB tool would allow the FPC to change capital requirements above normal microprudential standards in relation to all loans and exposures of banks to borrowers in the United Kingdom. The SCR tool is more targeted and would allow the FPC to change capital requirements above microprudential standards on exposures to specific sectors judged to pose a risk to the system as a whole. Under the draft legislation, the FPC will be able to adjust SCRs for banks' exposures to three broad sectors (residential property, including mortgages; commercial property; and other parts of the financial sector), as well as more granular subsectors (for example, to mortgages with high loan to value or loan to income ratios at origination).

The CCB and SCR tools will apply to all UK incorporated banks, building societies and large investment firms (broker dealers). The use of these tools might create incentives for regulatory arbitrage and for activity to move to financial institutions not covered by the rules. The FPC will monitor the extent to which such 'leakages' reduce its ability to mitigate systemic risks and, if necessary, will make Recommendations to HM Treasury to expand the set of institutions to which these tools apply.

The FPC expects to co-operate closely with overseas regulators, including the European Systemic Risk Board (ESRB), to ensure that macroprudential policy decisions are implemented effectively. The draft CRD4/CRR sets out formal co-ordination arrangements for the CCB. Overseas regulators will apply the CCB chosen by the FPC to their banks' UK exposures, while the relevant overseas regulators will normally set the CCB in relation to UK banks' overseas exposures. SCRs will be subject to different co-ordination arrangements under the forthcoming CRD4/CRR.

The use of these tools will improve the ability of the financial system to withstand shocks. The CCB applied to UK exposures and SCRs will be zero when the FPC judges that current and future threats to financial stability in the United Kingdom are

low. When threats to stability emerge, the FPC would be able to raise the CCB or SCRs, requiring banks to have a larger capital buffer to absorb unexpected losses when the 'cycle' turns. In simple terms, if banks have, say, 20% more capital, they can absorb losses that are 20% greater, all else equal. The tools might also affect the resilience of the financial system through effects on the price and availability of credit. These effects are likely to vary over time and according to the state of the economy. For example, in an upswing, an increase in the CCB or SCRs is likely to tighten credit conditions facing households, companies and financial intermediaries. This may help arrest the build-up of vulnerabilities created by an overextension of credit and thereby boost banks' resilience.

Conversely, previously accumulated capital buffers may be reduced when threats to resilience are judged to have receded or banks' capital buffers are judged to be more than sufficient to absorb future unexpected losses in the event of stress. The size of such future losses may in some circumstances be influenced by the setting of capital requirements. Reducing capital buffers may then help to mitigate a collective contraction in the supply of lending to households and businesses that could weaken growth and undermine resilience. At other times, however, such as periods of acute uncertainty in financial markets, banks may find it hard or expensive to fund themselves at lower capital ratios, so that any reduction in capital buffers has little effect or is even counterproductive. In those circumstances, lending might be better supported by the alternative action of Recommending that banks raise *levels* of capital to underpin investor confidence in the financial system.

Using the CCB and SCRs will in some circumstances affect economic growth. In the medium term, if these tools are successful in reducing the likelihood and severity of financial crises, their use is likely to boost the expected level of UK GDP. In the near term, while historical experience is limited, the best available studies point, on average, towards only a modest negative impact on near-term growth if the CCB is tightened, particularly if the outlook for inflation weakens such that monetary policy can be used to cushion the impact on growth.

Many indicators will be useful for shaping the decisions of the FPC on these tools and helping it to explain those decisions publicly. No single set of indicators can ever provide a perfect guide to systemic risks, or to the appropriate policy responses, due to the complexity of financial interlinkages, the tendency for the financial system to evolve over time and time lags before risks become apparent. The choice of indicators will

also evolve over time as the FPC learns from experience, as data availability and quality improve, and as new research is undertaken. Judgement will play a material role in all FPC decisions and policy will not be mechanically tied to any specific set of indicators. To support its judgement, the FPC will monitor a wide set of information, varying over time depending on the emerging risks, including both market and supervisory intelligence, and 'stress tests' of banking sector resilience.

The FPC will, however, routinely review the core indicators set out in **Tables C and D** (pages 38–40), which have been helpful in identifying emerging risks to financial stability in the past. These indicators relate only to the use of the CCB and SCR powers — other indicators and analysis will be important for assessing structural threats from the distribution of risk across, and interconnections within, the financial system. The core indicators include measures of balance sheet stretch within the financial system and among borrowers, and measures of terms and conditions in financial markets. Some of these indicators may prompt further analysis on whether risks are concentrated in particular subsectors. The FPC will also examine whether changing patterns in the distribution of risks across financial institutions, households or corporates, including those overseas, may signal rising risks. Since instability often follows periods of rapid change in the financial system, it will be important to consider significant changes in indicators alongside their absolute level.

The FPC will be more likely to adjust the CCB or SCRs when the degree of imbalance as measured by the core indicators is greater, when the different indicators convey a more homogeneous picture, and when that picture is more consistent with market and supervisory intelligence. The indicators will be considered alongside each other and market and supervisory intelligence to judge whether an aggregate or sectoral response is more appropriate. They will be published alongside the wider information set informing the FPC's decisions in its *Financial Stability Report* every six months.

The indicators may also be useful in judging whether or not policy has been effective. Success in this context means reducing the risk of a major disturbance to the financial system without having a significant adverse effect on the growth of the UK economy. The probability of a future systemic financial crisis cannot be readily observed. The success of the FPC's actions may, however, be partially assessed with reference to whether the indicators used to prompt and justify intervention evolve in ways that are more appropriate and sustainable.

1 Introduction

The Financial Services Act 2012 introduces legislation to create the Financial Policy Committee (FPC). The FPC's statutory responsibility will be 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', with the objective of contributing towards the Bank's Financial Stability Objective. Systemic risks include those attributable to 'structural features of financial markets, such as connections between financial institutions', to 'the distribution of risk within the financial sector' and to 'unsustainable levels of leverage, debt or credit growth'.

The FPC's task will not be to achieve resilience at any cost, however. Its actions must not, in the provisions of the legislation, have *'a significant adverse effect on the capacity of the financial sector to contribute to the growth of the UK economy in the medium or long term'*. The legislation provides that, subject to achieving its primary objective, the FPC must also support *'the economic policy of Her Majesty's Government, including its objectives for growth and employment'*.

The FPC will have two main sets of powers at its disposal. The first is a power to make *Recommendations*. It can make Recommendations to anybody. But the FPC will have a special power to Recommend, on a comply or explain basis, to the regulators — the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) — about the exercise of their functions, such as to adjust the rules that banks and other regulated financial institutions must abide by. Should the regulators decide not to implement Recommendations made on a comply or explain basis, they are required by the legislation to explain publicly their reasons for not doing so. This document is not about this first set of powers.

The second set of powers is to give *Directions* to those regulators to adjust specific macroprudential tools. The Government has consulted on its intention to give the FPC Direction power over sectoral capital requirements (SCRs).⁽¹⁾ It has also proposed making the FPC responsible for policy decisions on the countercyclical capital buffer (CCB) in the United Kingdom. The legislation requires the FPC to publish a Policy Statement explaining how the FPC intends to use the tools over which it has powers of Direction such as SCRs. While the legislation would not require that for the CCB — as powers here will be provided under the forthcoming revised European Union (EU) Capital Requirements Directive and Regulation (CRD4/CRR) — the FPC nevertheless considers it appropriate to produce such a statement in relation to the CCB. In addition to these powers, the Government has stated its intention to provide the FPC with Direction powers over a

time-varying leverage ratio tool, but no earlier than 2018 and subject to a review in 2017 to assess progress on international standards.⁽²⁾

The CCB and SCR tools are designed to reduce the likelihood and severity of financial crises. Their primary purpose is to tackle cyclical risks, while structural risks will be dealt with by the FPC using its Recommendation power. Both tools provide the FPC with means to change the amount of capital that banks⁽³⁾ must have when threats to financial stability are judged to be emerging. They build on the existing microprudential regime, under which capital requirements depend on an estimate of the riskiness of each loan or asset — for example, unsecured personal loans typically have higher capital requirements than mortgage loans secured on residential property. The CCB tool allows the FPC to change capital requirements, over and above their microprudential level, in relation to *all loans* made by banks to borrowers in the United Kingdom. The SCR tool allows the FPC to change capital requirements, over and above their microprudential level, on exposures to specific sectors judged to pose a risk to the system as a whole.

The CCB has been introduced globally through the international Basel III framework. In the European Economic Area (EEA), it will be implemented via CRD4/CRR. The Government has stated its intention to use the flexibility provided in the draft EU legislation to give the FPC power over the CCB rate applied to UK exposures as soon as is practicable after that legislation comes into force. The EU legislation has yet to be finalised, so this draft Policy Statement has been prepared on the basis of the current legislative drafts.⁽⁴⁾

This draft Policy Statement is structured as follows. Section 2 describes the CCB and SCR tools, including who they will apply to, how they fit with the existing regulatory framework, how decisions will be co-ordinated with overseas regulators, and how decisions will be communicated and enforced. Section 3 sets out the FPC's current assessment of how these tools will affect the resilience of the financial system and, given the secondary objective, growth. Section 4 explains the circumstances in which the FPC might expect to adjust the setting of each tool and provides a list of core indicators that the FPC will routinely review when reaching decisions.

This document is a draft of the Policy Statement that the FPC will produce to meet the statutory requirement to prepare and

(1) This does not preclude the possibility that the FPC, on occasion, may prefer to Recommend a change in SCRs rather than issue a Direction.

(2) The design of the leverage ratio tool will depend on the provisions of the relevant European legislation and will be set out in secondary legislation to be introduced by the Government at the time.

(3) In what follows, the term 'banks' is used to describe the set of firms to which the CCB and SCR tools will apply — namely banks, building societies and large investment firms. These institutions are defined explicitly in Section 2.2 of the Policy Statement.

(4) See Council of the European Union (2012a, 2012b) and European Parliament (2012a, 2012b).

maintain general statements of policy for its Direction-making powers. It has been prepared by the interim FPC in advance of the creation of the statutory FPC. Publication of the statement in draft is designed to assist Parliament's scrutiny of draft secondary legislation. As experience of operating the regime grows, the Policy Statement will be reviewed and updated from time to time.

2 Description of the tools

2.1 What is the countercyclical capital buffer and what are sectoral capital requirements?

The CCB tool requires banks to build up capital when the FPC judges it to be the best approach to head off threats to financial stability. An increase in the CCB serves two purposes. First, the additional capital buffer provides a cushion to absorb losses that are larger than anticipated under the normal microprudential regime.⁽¹⁾ Second, it provides incentives for banks to rein back on excessive or underpriced exposures, which might reduce the extent of losses when boom turns to bust. The CCB would be released either when threats to stability are judged to have receded, or when the size of banks' capital buffers is judged to be more than sufficient to absorb future unexpected losses and credit conditions and other relevant indicators are weak. This would help to mitigate a contraction in the supply of lending to households and businesses which, though possibly sensible for an individual bank, could make the financial system as a whole less resilient if it led to economic growth contracting and more borrowers defaulting.

Under Basel III, the CCB will be phased in globally between 2016 and 2019, but can be introduced sooner. It will be implemented in the EEA via the CRD4/CRR legislation. This legislation requires each Member State to designate an authority which will be 'responsible for setting the countercyclical buffer rate for that Member State' each quarter. The Government has proposed that the Bank of England be the designated authority for the CCB, with responsibility for policy decisions on the CCB delegated to the Bank's FPC. The Government has also stated its intention to give the FPC power over the CCB rate applied to UK exposures as soon as is practicable after the CRD4/CRR comes into force.

The SCR tool would provide a means for the FPC temporarily to increase banks' capital requirements on exposures to specific sectors. For example, if the FPC judged that exuberant commercial property lending posed risks to financial stability, it could increase SCRs on commercial property loans so that banks were required to have more capital against such exposures. As with the CCB, this should increase resilience by enabling banks to absorb a higher level of commercial property losses than envisaged under the normal microprudential regime. It would also provide targeted incentives for banks to limit the expansion of riskier commercial property exposures. Reducing SCRs back towards the normal microprudential level once threats to stability are judged to have receded, or when credit conditions in the relevant sector are weak and the size of banks' capital buffers is judged to be more than sufficient to absorb future unexpected losses, would allow banks to maintain resilience and mitigate a contraction in the supply of loans to the economy.

Both tools are therefore intended to incentivise banks to act pre-emptively, raising capital in good times, when it is more easily accessible, so that it can be used in bad times or when heightened risks to stability have receded.

2.2 To whom will the tools apply?

The CCB and SCRs will apply to all banks, building societies, and large investment firms incorporated in the United Kingdom. The Government has stated its intention to carve out the smallest investment firms from the scope of the FPC's powers regarding the CCB and SCRs, with the precise form of the exemption depending on the final text of CRD4/CRR. Under the current Council text, small and medium-sized investment firms may be exempted from the CCB if such an exemption does not pose a risk to financial stability. Under the current European Parliament text, the provisions on the CCB do not apply to investment firms that are not authorised to provide particular investment services. The tools may be applied at both the individual entity and consolidated group level, in the same way as banks' microprudential capital requirements. Generally, the FPC will apply the tools at both levels.

No other financial services firms will be covered by the FPC's macroprudential tools. As noted in the Government's consultation document, this '*might create incentives for regulatory arbitrage, which might result in risky activities migrating into other sectors in order to avoid being subject to macro-prudential regulation*'.⁽²⁾ The FPC will monitor the extent to which such leakages reduce its ability to mitigate systemic risks and, if it believes necessary, will make Recommendations to HM Treasury to expand the set of institutions to which these tools apply.

2.3 To which exposures will the tools apply?

The FPC's policy decisions on the CCB will apply to banks' UK exposures (ie lending). The treatment of UK banks' overseas exposures is described in Section 2.4 of this document.

Under the Government's draft legislation, the FPC will be able to adjust SCRs for exposures to three broad sectors:

- residential property, including mortgages;
- commercial property; and
- other parts of the financial sector.

The FPC will generally seek to act at the highest level of aggregation commensurate with the risks, in part to reduce the scope for arbitrage. But there may be occasions when risks can be better dealt with at a more granular level. Under the

(1) Capital can absorb losses while a bank remains a going concern because its value can be eroded through losses and there is no contractual obligation to pay shareholders (in the form of dividends or share buybacks).

(2) See HM Treasury (2012), page 30.

Government's proposals, the FPC will have the power to adjust SCRs for more granular subsectors, as well as for all exposures to a given sector. Such an approach might help to tackle threats to stability before they spread, particularly by leaning against exuberance in specific subsectors. In the mortgage sector, for example, it may on occasion be preferable to apply the SCR to only those mortgages with high loan to value (LTV) or loan to income (LTI) ratios at origination.

When applying the SCR tool to banks' exposures to other parts of the financial sector, the FPC will be able to target a broad range of exposures. This will include, among other things, secured and unsecured loans, and derivative and bond exposures to financial sector entities such as banks, building societies, investment firms, insurers, funds of various kinds and a range of other regulated and unregulated financial institutions.⁽¹⁾ When risks are particularly concentrated, it may be desirable to act in a more targeted way, applying SCRs to certain types of financial sector exposures only. This could be done in two main ways:

- First, by adjusting SCRs for *exposures to specific types of financial institution*. For example, prior to the current crisis,⁽²⁾ resilience may have been enhanced if capital requirements had been raised on banks' exposures to 'monoline' insurers that were specialising in selling protection against defaults in credit markets, or against exposures to 'special purpose vehicles' that were, for example, taking on debt to invest in securitised mortgages and other complex financial products. Alternatively, capital requirements could be increased on exposures to non-bank lenders if those institutions were financing a credit boom which could subsequently unwind and affect the core financial system through its interconnections with those institutions.
- Second, the FPC may adjust SCRs for *specific types of intra-financial system activity*, or by instrument. For example, had capital requirements been raised prior to the current crisis on riskier types of secured intra-financial system lending, such as through repurchase agreements (or 'repos') using low-quality collateral, banks might have reduced their provision of leverage (ie debt) and thus exposures to these markets, which might have built resilience.⁽³⁾ This might have reduced the fallout from the subsequent collapse in this segment of the repo market.

Both approaches are subject to regulatory arbitrage to avoid the rules, as well as other unintended consequences. If the FPC were to target particular types of institution, banks might be able to carry out the same activity through a different legal entity that is not subject to the requirements. And derivatives such as total return swaps may be used to mimic exposures, leaving scope for arbitrage.⁽⁴⁾ At times, it may be more appropriate to make policy Recommendations to mitigate risks

associated with particular types of intra-financial sector exposures rather than using the SCR tool — for example, Recommendations in respect of liquidity buffers or margining requirements may have a role in the case of repo activity. In its March 2012 Statement, the FPC signalled that once international standards and discussions had progressed further, it was minded to advise HM Treasury that it should have powers of Direction over a time-varying liquidity tool and that it should reconsider the case for Direction powers over the terms of collateralised transactions by financial institutions.⁽⁵⁾

The FPC intends to apply SCRs to *all* exposures to the targeted sector or subsector, regardless of their form and whether exposures are held in banks' trading or banking books. So if the SCR on residential mortgages is increased, this will apply to both mortgages held in the banking book and to exposures held in the form of a securitisation (originated or acquired), a purchased portfolio, a fund or for trading. The FPC considers that banks should adopt a 'look-through' approach to financial assets to determine their underlying risk — for instance, an increase in the SCR for banks' commercial property exposures will also apply to exposures to securitisations backed by commercial real estate loans. This is in line with the Basel capital framework.⁽⁶⁾ Consistent with the approach taken to capital requirements in the microprudential framework, the tool will apply to undrawn credit lines (eg overdrafts) and other such contingent obligations as well as loaned amounts.

In terms of geographic coverage, the FPC may act either on all the residential property, commercial property or financial sector exposures of banks, irrespective of the domicile of the ultimate borrower; or on their UK exposures only in those sectors; or on their exposures to other specific countries. For example, had capital requirements been increased specifically on UK banks' US sub-prime residential mortgage exposures before the current crisis, this would have left banks better able

(1) A derivative is a financial instrument whose value derives from the value of an underlying asset, such as a commodity, currency, or security.

(2) Throughout this Policy Statement, and unless qualified, the terms 'the current crisis' and 'this crisis' are used interchangeably to refer to the series of events and stresses that have affected the financial system from the collapse in some financial markets in the summer of 2007 to the present date, while acknowledging that the intensity and nature of the crisis has varied over this period.

(3) A repurchase agreement (repo) transaction entails borrowing money using securities as collateral. It involves the sale of a security for cash, coupled with an agreement to repurchase the same security at a predetermined price at a particular date in the future. For the lender, the corresponding transaction is called a 'reverse repo'. When the cash lent on repo trades is lower than the current market value of the security used as collateral, the level of overcollateralisation required is the 'margin'.

(4) Derivatives can be used to generate an exposure to a given asset without having to raise cash to buy it. For example a hedge fund could enter into a derivative contract called a 'total return swap' on which it paid the three-month interbank rate (Libor) and received any change in value on some other asset. This would mimic the returns it would receive by borrowing funds at Libor and using those funds to purchase that asset, thus allowing it to take a leveraged exposure to both its credit and market risk without having to borrow the cash to fund it.

(5) Recognising that the European Market Infrastructure Regulation establishes maximum harmonised prudential standards for the calculation of margin requirements by central counterparties (CCPs) across the EU.

(6) This provides that banks should, through their risk management processes and management information systems, 'be able to identify and aggregate similar risk exposures across the firm, including across legal entities, asset types (eg loans, derivatives and structured products), risk areas (eg the trading book) and geographic regions'. See Basel Committee on Banking Supervision (2009), page 16.

to absorb subsequent losses and may also have limited the growth in these exposures.⁽¹⁾ The FPC may also adjust SCRs on UK banks' foreign exposures to reciprocate decisions taken by overseas authorities. Under CRD4/CRR, a process will be introduced to co-ordinate macroprudential measures taken by Member States, especially where the measures may affect more than one Member State, as described below.

2.4 How will decisions on these tools be co-ordinated with overseas regulators?

The FPC expects to co-operate closely with overseas regulators, including at the European Systemic Risk Board (ESRB) and through other global fora (such as the International Monetary Fund, the Committee on the Global Financial System and the Basel Committee on Banking Supervision), to ensure that macroprudential policy decisions are implemented effectively and that cross-border leakages are dealt with appropriately.

Under the Government's planned implementation of the draft European legislation, the FPC will set the CCB rate to be applied to all lending by banks in the United Kingdom, irrespective of the country of origin of the lender.⁽²⁾ In the same way, other countries will set national CCB rates that will apply to lending by UK banks overseas. Banks that operate internationally will face a CCB that *'shall consist of the weighted average of the countercyclical buffer rates that apply in the jurisdictions where the relevant credit exposures of the institution are located'*.⁽³⁾ **Table A** illustrates how individual banks will calculate their 'institution-specific CCB rate'. The institution-specific CCB rate for a domestically active bank (Bank A) will be the UK CCB rate, whereas that for an internationally active bank (Bank B) will be a weighted average of the UK CCB rate and foreign CCB rates.

Table A Illustrative CCB rates for different banks

	Credit exposures	UK CCB rate (percentage points)	Foreign CCB rate (average across countries) (percentage points)	Institution-specific CCB rate (percentage points)
Bank A	100% UK 0% Foreign	1	2.5	1
Bank B	50% UK 50% Foreign	1	2.5	1.75

Under the draft EU legislation, within the EEA, these reciprocal arrangements — whereby overseas regulators apply a CCB rate chosen by the FPC to their banks' UK exposures and *vice versa* — will be mandatory for CCB rates of up to 2.5% of risk-weighted assets. The draft EU legislation also permits authorities to apply CCB rates that exceed this level. In this case, there is a greater potential scope for cross-border leakages. The FPC expects ordinarily to reciprocate overseas authorities when such CCB rates are judged appropriate. For exposures to countries outside the

EEA, the FPC can set CCB rates that are higher than those chosen by the relevant overseas authorities — including where these authorities choose not to activate the CCB at all — when, in its view, the risks to UK financial stability justify such action. In exercising this option, the FPC intends to focus its analysis on countries to which the UK financial system has material exposures, either directly or indirectly.

The draft EU legislation envisages that the ESRB will play an important role in co-ordinating decisions on the CCB across the EEA. As set out in the Council CRD4 text, this will include providing *'guidance on variables that indicate or might indicate the build-up of system-wide risk in a financial system, and on other relevant factors that should inform the decisions of designated authorities on the appropriate CCB rate'*, including the credit-to-GDP gap (see Box 2 in Section 4), and giving *'principles to guide designated authorities when exercising their judgement as to the appropriate CCB rate'* and making recommendations on buffer decisions applicable to non-EEA exposures.

Other macroprudential interventions, including SCRs, will be subject to different co-ordination arrangements in the EEA. The draft CRD4/CRR sets out a formal framework of constrained discretion, balancing flexibility for national authorities to take action with co-ordination within the EEA. Under the Council version of this framework, it is currently envisaged that Member States' authorities will be able to adjust capital requirements on residential property, commercial property and financial sector exposures up to a certain threshold without procedural constraint.⁽⁴⁾ Proposals to act beyond this threshold would be submitted to the European Commission, the European Banking Authority (EBA) and the ESRB, who would each be required to assess the potential impact of the proposals on other Member States. The Council will consider the opinion of the Commission, EBA and ESRB and whether the proposed measures entail *'disproportionate adverse effects on the whole or parts of the financial system in other Member States'*. The FPC will have due regard to the impact of its decisions on jurisdictions both inside and outside the EEA and will liaise with other overseas authorities, including the Committee on the Global Financial System and the Basel Committee on Banking Supervision, where appropriate.

- (1) Where the FPC does decide to tackle exuberance in lending to a particular jurisdiction, such exposures should be determined on a so-called 'ultimate risk' basis, so that the relevant country is determined by where the guarantor of the exposure resides, rather than where the exposure has been booked. In relation to securitisations, for example, this would mean that the properties on which the underlying mortgages were secured would determine the jurisdiction of the exposure.
- (2) To be specific, the FPC will set the CCB rate applied to UK lending by banks incorporated in the United Kingdom. But under the reciprocity arrangements set out in Basel III and the draft CRD4/CRR, overseas regulators will be bound to apply a CCB rate to their banks' UK exposures which is no less than the rate chosen by the FPC for CCB rates up to 2.5% of risk-weighted assets.
- (3) Article 130 of draft CRD4/CRR. The weighted average is calculated on the basis of the proportion of each bank's own funds requirement that relates to the relevant credit exposures in each jurisdiction.
- (4) Under Article 443a of the draft CRD4/CRR, risk weights may be increased by up to 25% without procedural constraint under the Council version of the framework.

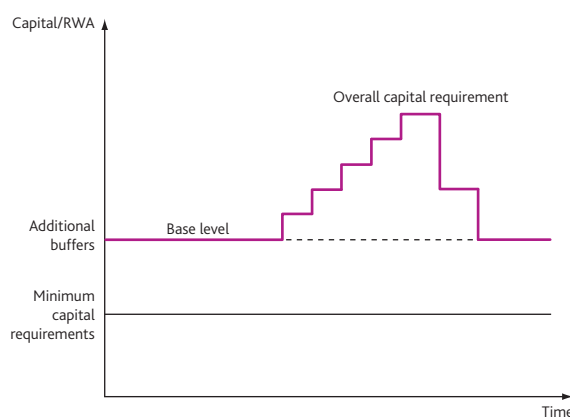
2.5 How do these tools fit with the rest of the regulatory framework?

Under Basel III and the draft CRD4/CRR, the microprudential regulatory capital framework comprises the following elements which all fulfil distinct purposes:⁽¹⁾

- a common minimum capital requirement, designed to protect against credit, market, operational and settlement risks, for which banks follow internationally agreed methods for calculation and calibration (on the basis of prudent valuation estimates);
- additional requirements advised by the PRA or FCA reflecting risks not fully tackled by the minimum capital requirement (such as interest rate risk in the banking book), or capital needed to compensate for individual banks' shortcomings in management and governance or risk management and controls;⁽²⁾
- a capital conservation buffer, designed to avoid breaches of minimum capital requirements. Banks with capital ratios within the conservation buffer will face automatic distribution restrictions;
- a systemic risk buffer for the banking system as a whole (or a subset thereof) to mitigate structural macroprudential risks and, separately, a buffer applied to individual banks judged to be systemically important;⁽³⁾
- the PRA and the FCA will also have powers to give guidance on capital levels, which will include an element reflecting a forward-looking assessment of the capital required to ensure that banks' minimum level of regulatory capital can be met at all times, even after severe but plausible stresses.⁽⁴⁾

The CCB and SCRs will be additional to these capital requirements, as illustrated in **Figure 1**. The FPC and the microprudential regulators will set these different requirements in a way that aims to avoid capital being required twice for the same risk. When threats to resilience in the United Kingdom are low, the FPC expects the CCB rate applied to UK exposures and SCRs to be set to zero. The microprudential capital requirements will therefore form the base level for banks' capital requirements, with the FPC increasing the CCB or SCRs only when threats to financial stability emerge. The setting of the CCB will take into account whether or not the SCR has been activated, and *vice versa*. The CCB and SCRs will be reduced back to the normal microprudential floor either when threats to resilience are judged to have receded, or when credit conditions are weak and the size of banks' capital buffers is judged to be more than sufficient to absorb future unexpected losses.

Figure 1 Illustration of the capital framework^(a)



(a) 'Additional buffers' refers to the capital conservation buffer, systemic risk buffers and any forward-looking guidance on capital levels by the microprudential regulators.

In the microprudential framework, capital requirements are applied uniformly to both the stock of exposures on a bank's books and to its new exposures. But the FPC could treat the two differently for the SCR tool. Setting different capital requirements on new exposures created after a specific point in time may give the FPC greater influence over banks' incentives to lend, and thus act more directly on credit conditions. This better reflects the fact that microprudential risks vary over the cycle with lending and macroeconomic conditions — loans extended at the peak of the cycle, for instance, tend to be more risky than loans made at the trough. Such an approach might imply a relatively limited increase in capital in absolute terms, however. Having different approaches to tackle particular risks complements the more targeted nature of the SCR tool. The FPC intends to choose the approach appropriate for the risks at hand.

2.6 How will the FPC's decisions on macroprudential tools be communicated and enforced?

The FPC's policy decisions — and the text of any Directions issued to the PRA or the FCA — will be published in the quarterly FPC Record after its policy meetings.⁽⁵⁾ The FPC will explain the background to those decisions in its six-monthly *Financial Stability Report*, including an estimate of the costs and benefits of its actions — unless in its opinion such an assessment is not reasonably practicable. The FPC's Directions

(1) The framework for determining regulatory capital is explained in more detail in Bank of England and Financial Services Authority (2012).

(2) As noted in Bank of England and Financial Services Authority (2012), the PRA's approach to setting these 'Pillar 2' requirements will be consulted on in due course.

(3) Given the current draft status of CRD4/CRR, there is uncertainty about what final legislation might provide for with regard to these two buffers and their interaction.

(4) Further details on how the PRA and the FCA's approach to determining regulatory capital will be affected by introduction of the CCB and other forthcoming changes to the capital framework will be set out in documents accompanying the implementation of EU's revised CRD4/CRR (see Bank of England and Financial Services Authority (2012)).

(5) Under the legislation, there is a general provision to allow the FPC not to publish its decisions, including Directions on SCRs, immediately where this would be against the public interest. But it must keep the decision not to publish under review. This does not relate to the CCB as, under the current draft CRD4/CRR, designated authorities are obliged to publish decisions quarterly.

and a copy of each *Financial Stability Report* will also be laid before Parliament by HM Treasury.

In addition, the draft EU legislation requires each national macroprudential authority to 'assess and set the appropriate CCB rate for its Member State on a quarterly basis'.⁽¹⁾ It also requires each authority to '*announce the quarterly setting of the CCB rate by publication on its website*',⁽²⁾ together with a justification for its decision. The FPC will carry out these tasks in the United Kingdom.

Under the draft CRD4/CRR, banks will typically have twelve months to meet an increase in the CCB, although the legislation provides for a shorter implementation period in exceptional circumstances. Banks that fail to meet the buffer level in the required time or breach it subsequently will be subject to automatic restrictions on the dividends and discretionary bonuses that they can pay out and will be required to prepare a plan explaining how they will meet the buffer level within an appropriate timeframe.⁽³⁾ It will be the responsibility of the regulators — the PRA and FCA — to monitor compliance and to impose further supervisory measures if needed. A decision to *decrease* the CCB can take effect immediately.

The regulators must implement Directions by the FPC to change SCRs as soon as reasonably practical. The FPC recognises that the implementation time will depend on a number of factors, including providing banks with a reasonable time to respond, any procedural requirements that apply to the PRA and the FCA, and the implementation approach chosen. Occasionally, it may be important for a Direction to be implemented quickly to ensure it is effective — for instance, when a change in capital requirements is targeting new lending flows. SCRs targeted at the stock of banks' exposures may require more significant adjustment by banks, thus needing a longer implementation timeframe. The FPC may issue a Recommendation on the timing of implementation alongside its Direction, which could be subject to a duty to 'comply or explain'.

Subject to CRD4/CRR, SCRs could be implemented by amending 'risk weights', which affect risk-weighted assets and minimum capital requirements. Alternatively, the tools could be implemented via capital buffers, which apply over and above minimum capital requirements. The PRA and the FCA will explain to banks how they will implement Directions, including over what timeframe, and will report back to the FPC on progress.

Pillar 3 of the Basel framework requires that banks disclose specific information about minimum capital requirements. But Pillar 3 requirements do not currently separate out capital requirements that derive from macroprudential interventions. The draft European legislation will require each bank to

disclose its institution-specific CCB rate (calculated as the weighted average of the CCB rates applying in the jurisdictions to which the bank has relevant credit exposures, as set out in Section 2.4 above). The FPC believes that disclosing the effect of SCRs would help market participants to assess banks' risk profiles and capital adequacy and is an essential part of transparency about the FPC's policy more broadly.

(1) See Article 126(3) of Council of the European Union (2012a).

(2) See Article 126(8) of Council of the European Union (2012a).

(3) Under the draft CRD4/CRR, banks whose capital ratio falls within the upper quartile of the combined conservation buffer and CCB will be required to retain 40% of their profits. Banks then face a sliding scale of restrictions, whereby as a bank's capital ratio falls further from the target, it is required to conserve capital by paying out smaller dividends and bonuses to shareholders and employees. Specifically, these distribution restrictions increase to 60%, 80% and 100% as banks' capital ratios fall to the third, second and first quartiles respectively.

3 Impact of the tools on financial stability and growth

The CCB and SCR tools are both designed to enhance the resilience of the financial system. They can do this in two ways: first, via the *direct* effect in making the financial system better able to withstand shocks; and second, via the *indirect* effect on the amount of financial services supplied by the financial system through the cycle (either through the distribution or overall level of these services). In doing this, these tools may also have an impact on economic growth, both in the near term and, conceivably, over longer horizons. The key links in this chain are illustrated in Figure 2.⁽¹⁾

3.1 Direct impact on resilience

Capital acts as a cushion to absorb losses. When a bank's capital is insufficient and prospective losses become so large as to threaten solvency, it will find it hard to continue to fund itself in private markets. This was the situation facing a large number of financial institutions internationally during this crisis. The result was a sharp contraction in both intra-financial system lending and the supply of credit to the real economy, with adverse consequences for the entire financial system. Governments responded with tax-payer bail outs to back-stop the financial system. The sharp 'deleveraging' that followed the outbreak of this crisis has contributed to a severe recession and a protracted slowdown in the United Kingdom and elsewhere.

The CCB and SCR tools provide a means for the FPC to tackle risks that arise to the financial system. Had these tools been available and tightened prior to the current crisis (as Figure 2 illustrates), banks would have had three broad options for how to respond:

- First, if the market had permitted it, they could have offset the increase in capital requirements by *reducing any voluntary buffers* they held, leaving overall capital levels

unchanged. If this route had been taken, then the policy change would have had little effect on the resilience of the system;

- Second, they could have *raised capital*, either by cutting dividends and bonuses to retain a greater proportion of their earnings or by issuing new shares;
- Third, they could have *reduced their risk-weighted assets*. This can be achieved either by reducing exposures or by rebalancing them away from riskier assets.

If banks had built up equity capital, they would have been able to absorb larger shocks before solvency was threatened, mitigating the negative dynamics described above. In simple terms, with, say, 20% more capital, banks could have absorbed losses that were 20% greater providing all else, including their liquidity buffers, was held equal. The tool would therefore have made the financial system more resilient — a channel depicted by the arrows (in Figure 2) linking the tool to banks' capital ratios and resilience.

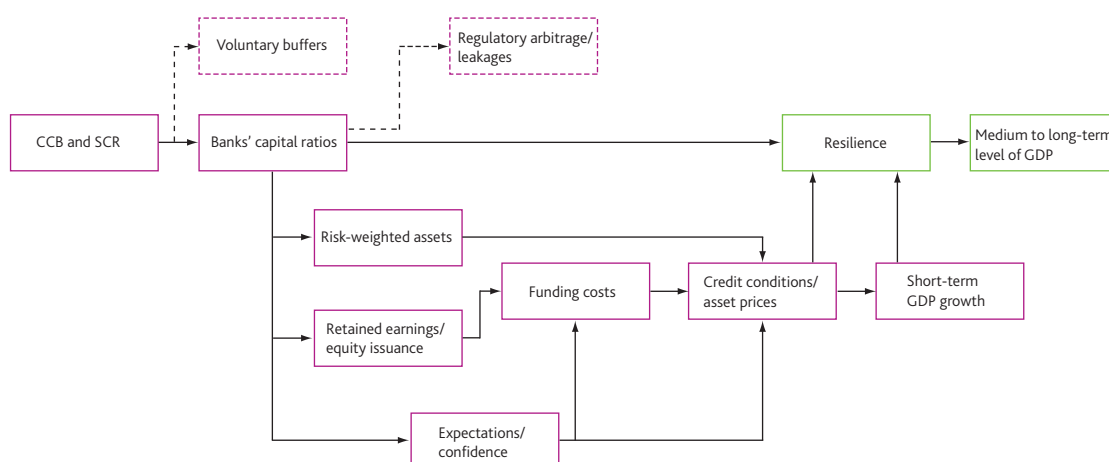
There may, however, be unintended consequences of using these tools:

- First, the CCB applies across the board to all UK exposures. Its use may therefore leave an apparently profitable boom in one part of the economy or financial system relatively untouched while reducing lending to other parts of the economy. To avoid this perverse outcome, SCRs are an important complement or alternative to the CCB. There is a risk though that applying SCRs to one sector may lead to banks increasing exposures in other systemically risky sectors that are not subject to SCRs;⁽²⁾

(1) See also Committee on the Global Financial System (2012).

(2) This need not be of concern if exposures in such sectors are appropriately diversified and priced.

Figure 2 The impact of the CCB and SCR on resilience and growth



- Second, the effectiveness of both tools is vulnerable to flaws in microprudential risk weights. In particular, they will have less effect in circumstances where microprudential risk weights understate true risks or where opportunities exist for banks to influence their measured risk-weighted assets.⁽¹⁾ This risk is made more acute by the fact that risk exposures are likely to build up most rapidly on assets where risk is underestimated as this is where the regulatory constraints on leverage are loosest;
- Third, both tools are likely to cause some lending to migrate to banks or other institutions to which the tools do not apply. The FPC will seek to monitor the extent of such leakages and, if it judges necessary, will make Recommendations to HM Treasury or the regulators to expand the scope of these tools. The FPC's tools are also likely to affect different banks in different ways and the impact will depend (among other things) on an individual bank's size, business model and corporate form.⁽²⁾ When making macroprudential policy decisions, the FPC must have regard to *'the principle that a burden or restriction which is imposed on a person, or the carrying on of an activity, should be proportionate to the benefits, considered in general terms, which are expected to result from the imposition of that burden or restriction'*.⁽³⁾

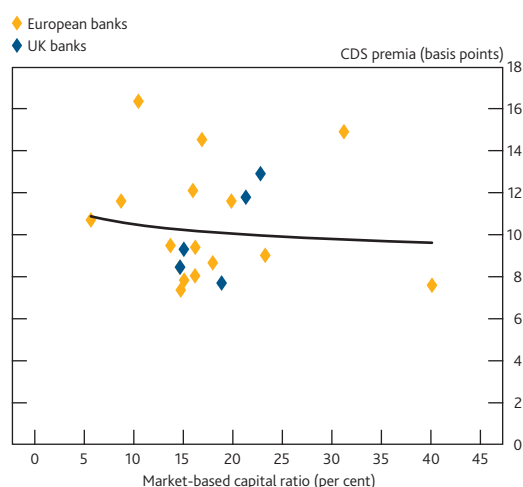
3.2 Indirect impact on resilience

In addition to those *direct* effects on resilience, the CCB and SCR may also alter the ease with which households and companies are able to borrow. This, in turn, may have *indirect* consequences for financial institutions' resilience. These effects are complex: there is limited historical experience from which to learn and it seems plausible that their impact will vary considerably depending upon prevailing economic conditions. Nonetheless, some general statements are possible.

Consider first a situation where market participants perceive, potentially mistakenly, that banks are solvent and risks to the stability of the banking system are small. In this case, banks can borrow cheaply at a rate that may be relatively insensitive to the amount of capital they have. As **Chart 1** shows, this was the situation preceding the current financial crisis, while acknowledging the potential mispricing of both of these indicators. Banks' cost of equity tends to exceed the rate at which they can borrow, however.⁽⁴⁾ So an increase in the CCB or SCRs in such circumstances is likely to increase banks' *overall* funding costs, as cheap debt will be replaced by more expensive equity. Banks may then pass on these higher costs by charging higher interest rates on their loans, reducing the amount of credit supplied to the economy.

This gives rise to an indirect channel through which these tools might bolster resilience. If capital buffers are increased in the midst of a credit boom, then the tighter credit conditions that

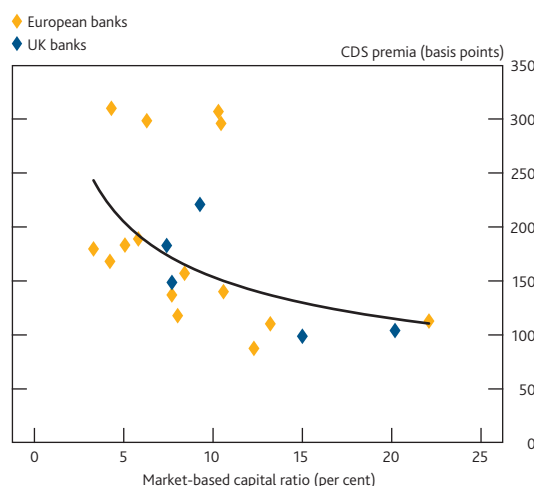
Chart 1 Relationship between market-based capital ratios and funding costs in December 2005^{(a)(b)(c)(d)}



Sources: Bank of England, Capital IQ, Markit Group Limited, published accounts and Bank calculations.

- Market-based capital ratios are banks' market capitalisation as a percentage of published risk-weighted assets.
- The sample shown is the largest 20 European banks by assets.
- Funding costs are proxied by five-year senior CDS premia. The 'line of best fit' shown above illustrates their relationship with market-based capital ratios.
- Where possible, Capital IQ data has been used to calculate the market-based capital ratio, but for some banks it was necessary to use published accounts data.

Chart 2 Relationship between market-based capital ratios and funding costs in November 2012^{(a)(b)(c)(d)}



Sources: Bank of England, Capital IQ, Markit Group Limited, published accounts and Bank calculations.

- Market-based capital ratios are banks' market capitalisation as a percentage of published risk-weighted assets.
- The sample shown is the largest 20 European banks by assets.
- Funding costs are proxied by five-year senior CDS premia. The 'line of best fit' shown above illustrates their relationship with market-based capital ratios.
- Where possible, Capital IQ data has been used to calculate the market-based capital ratio, but for some banks it was necessary to use published accounts data.

- The risk of this is more material for banks using internal model-based approaches to calculate regulatory capital; banks using a standardised regulatory approach will have less scope for such arbitrage.
- For instance, one possible impact of SCRs (if implemented via a floor) may be to reduce the differential in capital requirements between banks using model-based approaches and those using the standardised approach.
- As per the legislation (see section 9F of the Bank of England Act 1998).
- This reflects the preferential treatment of debt in the tax system, market perceptions that the debt-holders of large banks are unlikely to suffer losses because such banks will not be allowed to fail (the so-called 'too-big-to-fail' problem), and greater uncertainty over the future earnings that will accrue to shareholders compared to debt-holders who have more certainty over interest payments. These frictions may also make the cost of debt insensitive to banks' leverage and hence their solvency risk.

follow may help arrest the build-up of vulnerabilities created by the overextension of credit. Symmetrically, if previously accumulated capital buffers are reduced in the midst of a contraction, then that may help to loosen credit conditions if banks are constrained by their regulatory capital requirements, so boosting the economy and thereby helping to reduce borrower defaults. There is an important difference between the SCRs and the CCB in this regard. Changes in SCRs affect the *relative cost* to a bank of continuing to lend to the targeted sector. Changes by the FPC to the CCB rate applied to UK exposures, by contrast, affect capital requirements relating to all UK lending but not on foreign lending.

The effect of these tools on risk-taking behaviour will be more powerful if financial markets anticipate that the policy change will be reinforced by further policy changes in the future if excessive risk-taking continues. An FPC policy decision to increase either the CCB or SCRs may therefore lead banks collectively to reduce their risky exposures, enhancing the resilience of the financial system as a result. As in other areas of public policy, there could be an important role for expectations in shaping behaviour. This 'signalling channel' is depicted in **Figure 2** by the arrows running from capital ratios through to credit conditions, via the box marked 'expectations', and then on to resilience.

There are as yet no published estimates of the likely impact of changes in the CCB or SCRs on credit conditions. But some recent studies have analysed the quantitative impact of an increase in capital requirements on banks' lending behaviour (**Table B**). While the results differ according to the methodologies employed and whether permanent or temporary shocks are being analysed, most find that an

increase in regulatory capital requirements generates only a modest tightening in credit conditions. A 1 percentage point increase in capital requirements is estimated to lead to an increase in the interest rate on bank loans of between 4.5 and 25 basis points and a decline in the quantity of lending of between 0% and 3.6% relative to baseline, with one study finding a somewhat larger impact on bank loans. These effects operate with long and variable lags, such that it takes time for the full impact of a change in capital requirements to be felt on credit conditions.

These are the best quantitative estimates currently available to guide the FPC in setting the CCB and SCRs. But the uncertainty is sufficiently large that they need to be treated with caution. One reason for this is that the results pertain to a change in headline capital requirements, whereas the CCB and SCRs will apply to only a subset of banks' balance sheets — namely their overall UK lending or sectoral exposures. Another reason for caution is that two of the studies above assume a permanent one-off increase in capital requirements rather than a countercyclical regime, under which capital requirements are increased in response to emerging threats to stability and then reduced. More fundamentally, all such estimates reflect average relationships between banks' capital ratios and credit conditions over the past. It is well known that past relationships are often a poor guide to the future, particularly when there are large structural changes in the economy. The creation of the FPC might be one such structural change. To give one example of how this might affect the multipliers above, if financial markets come to expect the FPC to raise capital requirements in a sequence of steps when exuberant lending threatens financial stability, then the initial impact of the FPC's actions might be larger than past relationships would suggest. As time passes and evidence develops, improving understanding of the quantitative effects of these macroprudential tools will be an important topic for future research by academics and staff in policy institutions.

Table B Illustrative estimates of the impact of a 100 basis point increase in banks' headline capital requirements on credit conditions

	Loan rates (basis points)	Loan volumes (per cent)
Permanent change in required capital		
Macroeconomic Assessment Group (2010) ^(a)	17.3 [5.1, 25.0]	-1.4 [-0.7, -3.6]
Elliott (2009) ^(b)	[4.5, 19.0]	–
Temporary change in required capital		
Aiyar, Calomiris and Wieladek (2012) ^(c)	–	[-6.8, -9.0]
Francis and Osborne (2012) ^(d)	–	0.0

(a) The Macroeconomic Assessment Group (MAG) analysed the impact of the transition to Basel III across a range of alternative models, calibrated across a wide variety of jurisdictions (including the United Kingdom). The reported figures in the table refer to the median impact across a range of estimated models (see Annex 2.2 in MAG (2010)), with the maximum and minimum reported in square brackets. Estimation assumes implementation of permanently higher capital requirements over two years. Results are for the 18th quarter of the simulation. Monetary policy is held constant.

(b) Results based on a loan pricing equation calibrated for US banks linking capital requirements to lending rates. The maximum effect refers to the case where banks are able to pass through in full the costs of higher capital requirements to their customers. The minimum effect assumes a modest decline in banks' funding and administrative costs. Results are calculated from Tables 1 and 2 in Elliott (2009). The exercise assumes no response of monetary policy to the shock.

(c) Results based on an econometric analysis of the impact of the UK Financial Services Authority's microprudential Pillar 2 requirements over the period 1998–2007. Reported results show the cumulative impact, excluding the potential for leakages via foreign branch lending. Monetary policy is held constant.

(d) Taken from Francis and Osborne (2012), Table 5. Results based on an econometric analysis of the impact of microprudential Pillar 2 requirements imposed by the UK Financial Services Authority over the period 1996–2007. Results assume a 44% pass-through from regulatory capital requirements to banks' capital ratios. Monetary policy is held constant.

The relationship between capital requirements and credit conditions might vary across time and economic circumstances for other reasons too. For example, in a situation of acute uncertainty in which market participants are highly concerned about banks' vulnerabilities to shocks, banks' borrowing costs may be sensitive to their capital adequacy (see **Chart 2**). Banks may be reluctant to raise external capital unilaterally and may be insufficiently profitable to generate capital organically. But a decision to increase capital adequacy for all banks — if combined with a Recommendation to do this by boosting the *level* of capital rather than by reducing the level of assets — may solve this co-ordination problem and improve confidence to such an extent that overall funding costs fall. If the FPC is concerned not to inhibit the supply of lending to the real economy, adjusting to higher capital requirements via the level of capital (ie the numerator of the capital ratio) would be important to avoid increasing banks'

incentives to raise their capital ratios by slowing lending growth (ie the denominator of the capital ratio). If the impact on the level of capital is large enough, credit conditions might then loosen and resilience increase, a channel shown (in **Figure 2**) by the arrow marked 'confidence' linking capital ratios to funding costs and credit conditions. The recapitalisation of UK banks in 2008 and the US stress tests and consequent capital raising of 2009 may have had precisely such an effect (Box 1).

This is not an exhaustive set of scenarios. It is intended to make clear that the impact of the CCB and SCRs on credit conditions is likely to vary depending on expectations, the health of the financial system, and the state of the economic cycle.

3.3 Impact on the level of GDP: cycle and trend

The costs of financial crises can be extremely large and there is now mounting evidence that the effects on economic activity can be long-lasting, if not permanent.⁽¹⁾ That being so, if the CCB and SCR tools are successful in reducing the likelihood and severity of financial crises, even by modest amounts, their use is likely to have substantial positive benefits for the expected level of trend UK GDP over the medium term.⁽²⁾ This channel is shown by the arrow linking resilience to medium to long-term GDP growth in **Figure 2**.

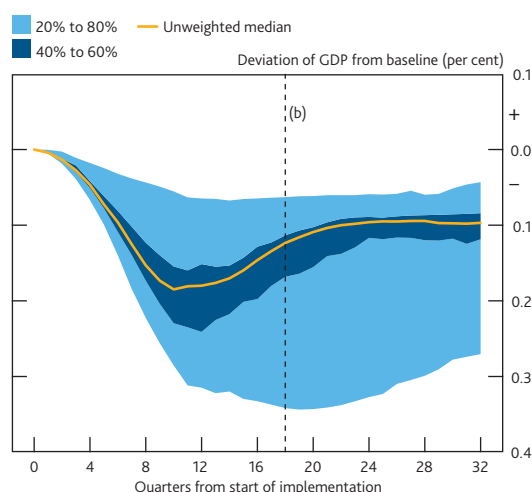
The CCB and SCR tools might also influence the cyclical pattern of economic growth in the short term. The relationships here are complex and there is limited historical experience with such measures from which to gauge them.⁽³⁾ And there is likely to be a range of possible scenarios and possible outcomes.

As described in Section 3.2, an increase in the CCB or SCRs in the upswing of the cycle would be expected to dampen credit conditions somewhat, raising interest rates on bank credit and reducing the availability of credit for some borrowers. This is likely to reduce overall spending, particularly in sectors that rely heavily on bank credit. GDP growth may slow in the short run as a result. Releasing the CCB or SCRs might have the opposite effect, loosening credit conditions, boosting overall spending and GDP growth in the short run. This channel is shown by the arrow in **Figure 2** linking credit conditions to short-term GDP growth.

The best estimates available point towards only a modest impact on economic growth through this channel. This is particularly so if the use of the CCB or SCRs changes the outlook for inflation such that monetary policy can be used to cushion the impact on growth. A study commissioned by the Financial Stability Board and the Basel Committee on Banking Supervision compares the impact of capital requirements on GDP growth across a wide set of models.⁽⁴⁾ It finds that GDP will contract by between 0.05% and 0.35% relative to baseline

in the short run following a 100 basis point increase in headline capital requirements; the largest average impact on GDP across these models is around -0.2% occurring after around ten quarters (**Chart 3**). These estimates include a simplified reaction of monetary policy in cushioning the impact on GDP growth of the tightening in credit conditions.

Chart 3 Estimated impact on GDP of a 100 basis point increase in capital requirements implemented over two years^(a)



Source: Macroeconomic Assessment Group (2010).

- (a) The shaded areas indicate the 20th–80th percentile and 40th–60th percentile ranges respectively. The orange line shows the unweighted median. The distribution of outcomes is computed across 89 models discussed in Macroeconomic Assessment Group (2010). The results do not include the impact of international spillovers.
(b) The vertical line indicates the 18th quarter.

These estimates may *understate* the impact of the CCB and SCR tools on growth for two reasons. First, they abstract from quantity rationing effects, whereby banks withdraw from providing credit to some borrowers at any price. Second, they assume a two-year adjustment period, which is longer than will be the case for the CCB tool. But they may also *overstate* the impact on growth. For instance, the estimates assume a permanent increase in capital requirements rather than a countercyclical regime, under which capital requirements are increased in response to emerging threats to stability and then reduced. And the shock under consideration is a change in headline capital requirements whereas the CCB and SCR tools used by the FPC will apply to only a subset of banks' balance sheets — namely their overall UK lending or sectoral exposures.

More fundamentally, there is no automatic link between credit conditions and short-run economic growth. Rather, the effects

- (1) See Cerra and Saxena (2008), International Monetary Fund (2009a, 2012), Reinhart and Rogoff (2009) and Schularick and Taylor (2012).
(2) This is consistent with the conclusion from a range of official sector studies, including the Basel Committee on Banking Supervision (2010a) and HM Treasury (2012).
(3) More fundamentally, and as previously mentioned in Section 3.2, historical relationships between bank balance sheets, credit and economic growth may be a poor guide to assessing the impact of these new macroprudential tools as banks are likely to change their behaviour in response to the regime change. This is a version of the so-called Lucas critique (Lucas (1976)).
(4) See Macroeconomic Assessment Group (2010).

Box 1

The impact of recent capital measures

What lessons are there from policy measures taken overseas to gauge the impact of the CCB on resilience, credit conditions and growth? While the CCB has not yet been used in its precise form, some closely related policies have been applied. This box considers two such case studies: (i) the Spanish dynamic provisioning regime, which in some ways is the closest analogue to the CCB that has been used in practice; and (ii) the US Supervisory Capital Assessment Program (SCAP) in 2009 and the EU's 'capital exercise' in 2011, both of which are examples of raising capital to restore confidence in the midst of a crisis.

Spanish dynamic provisioning

In 2000, the Banco de España required Spanish banks to have an extra buffer of provisions that could be used in bad times. The buffer was increased in line with banks' lending before being capped by the authorities and, at its height in 2004, amounted to around 1.25% of total loans. The Spanish authorities released the buffer in 2008 when the crisis hit, and by end-2010 it stood at below 0.5% of total loans.

This had little impact on lending during the boom, as customers borrowed instead from banks that were relatively less constrained by the policy. But it was more successful in allowing banks to absorb some losses and maintain lending during the crisis. One study estimates that a 1% pre-crisis provisions-to-loans buffer, when released in the downswing, increased credit by 10% and employment by 2.7% relative to what it would have otherwise been.⁽¹⁾ However, with hindsight, much higher provisions would have been needed to restrain credit and allow banks to absorb fully the losses from the crisis.

US Supervisory Capital Assessment Program and EU capital exercise

The US SCAP aimed to protect banks against potential tail risks in the face of heightened market uncertainty and allow them to maintain lending in case of an adverse shock. The US agencies assessed the capital shortfall of 19 banks relative to forward-looking macroeconomic stress scenarios. The results of the assessment, published in May 2009, highlighted a capital shortfall of around \$75 billion for ten of these banks.⁽²⁾ The majority of the shortfall was met over the next six months, primarily through increasing common equity.⁽³⁾

While it is difficult to draw firm conclusions, the SCAP did appear to improve market confidence in those banks faced with a shortfall. Equity prices and CDS spreads of those banks outperformed other banks (**Chart A**). The stock of lending by shortfall banks — stripping out write-downs on legacy assets — increased following the policy (solid blue line in **Chart B**),

albeit by a slightly smaller amount than lending by the non-shortfall banks (solid magenta line in **Chart B**).

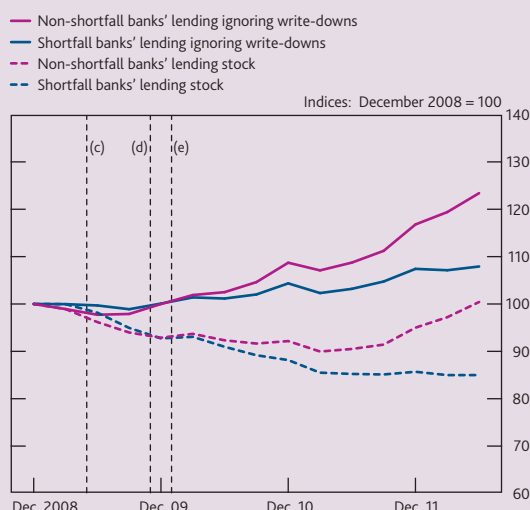
Chart A Market reactions to the US SCAP stress tests — difference between 'shortfall' and 'non-shortfall' banks^{(a)(b)}



Sources: Bloomberg, Markit Group Limited, UBS Delta and Bank calculations.

- (a) The differences are calculated as the index of 'shortfall' banks less that of 'non-shortfall' banks, for each of the CDS spreads and equity price series respectively. All of the underlying indices equal 100 on 6 March 2009.
- (b) The panel includes all 19 banks that took part in the SCAP where possible. Due to limited data availability, the equity price indices exclude GMAC and the CDS price indices exclude Regions Financial Corporation, Fifth Third Bank and Sun Trust Bank. PNC Financial Services Group CDS data are included from 31 March 2009.
- (c) First vertical dashed line: US agencies publish SCAP results, identifying banks with shortfalls (7 May 2009).
- (d) Second vertical dashed line: US agencies announce that banks have met their shortfalls (9 November 2009).

Chart B Real-economy lending by 'shortfall' and 'non-shortfall' banks in the US SCAP stress tests^{(a)(b)}



Sources: Federal Reserve National Information Centre and Bank calculations.

- (a) Total stock of loans and leases excluding those to financial institutions and non-US residents. For the series ignoring write-downs, the cumulative charge-offs on real-economy lending are added back into the stock of lending to neutralise the effect of charge-offs.
- (b) The panel includes all 19 banks that took part in the SCAP apart from Goldman Sachs and Morgan Stanley, due to limited data availability. 2008 Q4 and 2009 Q1 data for Ally Financial and March 2009 data for American Express have been estimated as the average of the year 2009.
- (c) First vertical dashed line: US agencies publish SCAP results, identifying banks with shortfalls (7 May 2009).
- (d) Second vertical dashed line: US agencies announce that banks have met their shortfalls (9 November 2009).
- (e) Third vertical dashed line: Lending data after 1 January 2010 have been adjusted to neutralise the effect of a change in the accounting rules, which required banks to take some securitisations back onto their balance sheet. This resulted in a higher reported lending stock for some banks, which did not correspond to real activity. These large increases in lending have been removed from the data.

A somewhat similar programme was implemented in the European Union in 2011, to help restore confidence in the banks in the midst of the sovereign debt crisis. In late 2011, EU banks were required to meet a 9% minimum core Tier 1 ratio by June 2012, after a sovereign stress, mainly by raising capital levels. The EBA announced a corresponding capital shortfall of about €76 billion for 27 EU banks. As in the case of the SCAP, the market reaction appeared to be positive: CDS spreads moved more favourably for banks that increased their capital than for those that did not. Thus far, shortfall banks have not reduced their real-economy lending, but it is too early to ascertain the full impact.

Conclusion

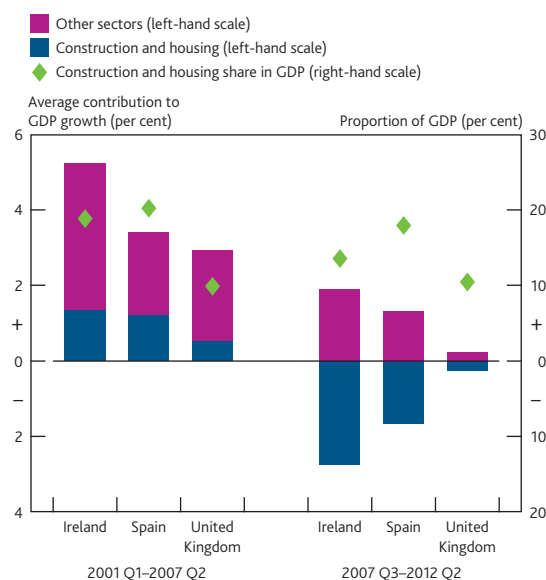
These experiences suggest that the impact of the CCB on resilience and credit conditions will depend on the

circumstances in which the tool is used. If used in a countercyclical manner, the CCB should increase resilience and help maintain lending in the downturn. But the lesson from Spain is that the tool may be ineffective in curbing exuberance in the upswing if buffers are small and applied unevenly across the financial system. An increase in capital requirements can also be used to support confidence during times of market stress, provided — as shown by the SCAP and EU experiences — banks are required to adjust by raising levels of nominal capital. Such actions do not necessarily have a negative impact on lending, although the evidence is not clear cut.

- (1) Jiménez *et al* (2012).
 (2) Board of Governors of the Federal Reserve System (2009a).
 (3) Board of Governors of the Federal Reserve System (2009b).

will depend on which sectors experience a change in credit conditions following the use of the CCB or SCR tools. These issues are highlighted by comparing the effect the credit boom had on growth in the United Kingdom prior to the current crisis with its effect in Spain and Ireland. The Spanish and Irish economies experienced extraordinary housing and construction booms between 1999 and 2007. As **Chart 4** illustrates, at the height of the boom, construction investment accounted for around 20% of the level of GDP in both countries and for a significant proportion of growth pre-crisis. Had the Spanish or Irish authorities raised capital buffers sufficiently to make their banking systems more resilient in the face of such imbalances, overall economic growth is likely to have been weaker in the short run. With the benefit of hindsight, it is clear though that such a slowdown in growth would have been small compared to the very severe effects of the subsequent credit crunch.

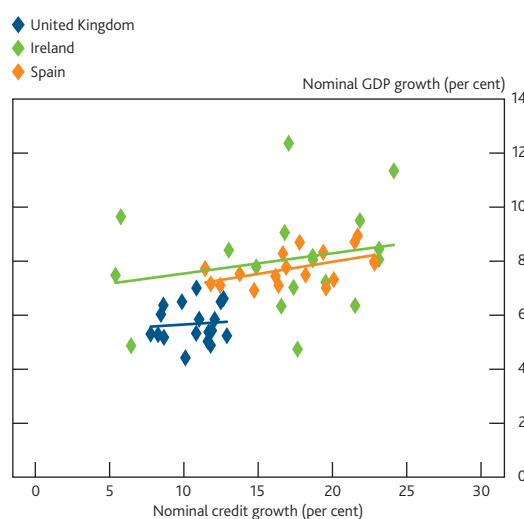
Chart 4 Contribution of construction growth to GDP



Sources: Eurostat and Bank calculations.

By contrast, the credit boom in the United Kingdom was largely associated with an increase in property prices and an unsustainable expansion in lending *within* the financial sector.⁽¹⁾ Many commentators consider the stimulus to economic growth from the pre-crisis credit boom to have been somewhat smaller in the United Kingdom as a result (**Chart 5**). It is likely, therefore, that the impact on growth may have been smaller than in Spain or Ireland had a tightening of either the CCB or SCRs cooled credit growth in these sectors.

Chart 5 Correlations between growth in credit and GDP, 2003–07^(a)



Sources: ECB, Eurostat and Bank calculations.

- (a) Percentage change in the stock of nominal credit, and nominal GDP compared to a year earlier. Data are quarterly, from 2003 Q1 to 2007 Q2. Credit covers all debt of the household, non-profit institutions and non-financial corporate sectors. This includes both loans and debt securities. Not seasonally adjusted.

A second difference is that the Monetary Policy Committee (MPC) in the United Kingdom had more flexibility than individual euro-zone countries to adjust interest rates to

(1) See Bank of England (2011).

influence the path of nominal demand so that inflation remained close to target. Had the CCB or SCRs been tightened in the United Kingdom prior to the current crisis, and had this weakened the outlook for aggregate demand and inflation, then it is plausible that the MPC might have mitigated some of the impact on growth through its setting of interest rates, shifting the composition of aggregate demand away from credit-intensive spending towards less credit-intensive spending.

4 Indicators for adjusting the tools

Many indicators, alongside supervisory input and market intelligence, will be useful for shaping the decisions of the FPC and helping it to explain those decisions publicly. No single set of indicators can ever provide a perfect guide to systemic risks, or to the appropriate policy responses due to the complexity of financial interlinkages, the tendency for the financial system to evolve over time and time lags before risks become apparent. And, in some cases, particular signals from the same indicator may have opposite implications depending on the underlying reasons for the movement in the indicator and the point in the financial cycle. Judgement will, therefore, play a material role in all FPC decisions and policy will not be mechanically tied to any specific set of indicators. To support its judgement, the FPC will monitor a wide and time-varying set of measures, depending on the emerging risks, including both market and supervisory intelligence, and 'stress tests' of banking sector resilience.

The FPC has, however, identified relatively short lists of core financial and economic indicators for the CCB and SCRs that it will routinely review in conjunction with analysis on the drivers of movements in them. These will provide some consistency to FPC decision-making and give a basis for explaining the Committee's decisions to an external audience, which should help to enhance the predictability of the regime and reinforce the signalling channel of macroprudential policy. In any particular set of circumstances, some of these indicators will be more important than others in helping the FPC to reach its judgements. But the greater the degree of imbalance as measured by the core indicators, the more homogeneous the picture that the different indicators convey, and the more consistent that picture is with market and supervisory intelligence, the more likely it is that the FPC will adjust the CCB or SCRs in response. The indicators will be considered alongside each other and market and supervisory intelligence to judge whether an aggregate or sectoral response is more appropriate. They will be published alongside the wider information set informing the FPC's decisions in its *Financial Stability Report* every six months.

For the CCB, one indicator is given particular prominence in the draft EU legislation — the credit-to-GDP gap, the difference between the ratio of household and corporate indebtedness to GDP and its long-term trend. Box 2 on pages 28–29 discusses its role in more detail and how the other indicators for the CCB will be seen as complementary to it, as envisaged in the Basel and draft CRD4/CRR texts. The remaining indicators, for both tools, have been helpful in identifying previous periods of financial instability, including the threats to resilience arising prior to and during the current financial crisis in the United Kingdom, and relate to the FPC's high-level views on the circumstances in which its powers over the CCB and SCRs might need to be deployed and deactivated.

The usefulness of these indicators may change as the FPC deploys them to help guide its decisions. If banks, businesses and households come to expect that policy actions will be partially informed by particular indicators, they may respond in a way which results in the historical relationships between those indicators and systemic risk weakening. More broadly, the indicators relate only to the use of the CCB or SCR powers — other indicators and analysis will, for example, be important for assessing structural threats from the distribution of risk across, and interconnections within, the financial system. The indicators will also evolve over time as the FPC learns from experience, as the financial system evolves, as data availability and quality improve and as new research is undertaken.⁽¹⁾ This is particularly the case for indicators speaking to the use of SCRs on financial sector exposures — an important dimension of financial stability analysis but one for which current indicators are all somewhat inadequate.

4.1 High-level considerations

Core indicators should highlight the need to adjust the CCB or SCRs to increase capital requirements above their normal microprudential level in a timely manner when threats to systemic stability are heightened, either at the aggregate level or from specific sectors. Such threats may stem from macroeconomic or financial risks affecting areas in which the financial system is heavily concentrated. But they often have their roots in a self-reinforcing cycle linking credit and asset prices, which lowers immediate defaults but encourages more risk-taking.⁽²⁾ Although such exuberance may appear across the economy as a whole, it sometimes arises first, or most powerfully, in specific sectors and may go hand in hand with rising household or corporate indebtedness. Risks may also be exacerbated by rising leverage in the financial system, perhaps due to a collective appetite to chase high returns (a so-called 'search for yield') or increased exposures within the financial system, by greater reliance on unstable sources of funding or by rising external indebtedness. And they may be amplified by either widespread or sector-specific relaxations in lending standards, which might also be reflective of wider conditions in financial markets. As a result, national balance sheets and the balance sheets of financial institutions, corporates and households may become overstretched, and increasingly vulnerable to even small increases in borrower default or falls in collateral values at exactly the time when low perceived risks could be depressing microprudential capital requirements.

At other times, it will be appropriate to adjust the CCB or SCRs to reduce capital requirements back towards their normal microprudential level. This will be the case when threats to

(1) Several international initiatives to improve financial sector data are likely to come to fruition over the next two years, including the introduction under CRD4 of common European capital reporting (COREP) and various G20-endorsed initiatives which target data gaps in respect of global systemic linkages between financial institutions (International Monetary Fund and Financial Stability Board (2009)).

(2) Minsky (1986), Bank of England (2009b, 2011), Geanakoplos (2010), Turner (2011), Tucker (2009, 2011) and King (2012).

resilience are judged to have receded and so the need for banks to have additional capital has passed. Such an action might be warranted if credit or other exposures become more sustainable, if sectoral imbalances correct, if the risk of external threats to the UK financial system diminishes, or if losses crystallise that can be absorbed within existing buffers to leave banks adequately capitalised.

In adjusting the CCB or SCRs, the FPC will take account of any circumstances in which the size of future losses — and hence threats to resilience — may be influenced by the setting of capital requirements. For example, efforts by banks to meet regulatory requirements by restricting lending could in some circumstances lead to a damaging collective contraction in the supply of credit, which weakens the economy and leads to more borrowers defaulting and ultimately more bank losses. By mitigating this risk, a timely reduction of such supplementary capital requirements may help to boost economic growth, and in so doing, help to maintain resilience. Consistent with this, the Basel III guidance for the CCB notes that the buffer could be *'released when the credit cycle turns so that the released capital can be used to help absorb losses and reduce the risk of the supply of credit being constrained by regulatory capital requirements'*.⁽¹⁾

A critical factor determining whether or not to reduce capital requirements in such circumstances would be the size of banks' (usable) capital buffers. If they are judged by the FPC, the microprudential regulators and bank investors to be sufficient to absorb banks' unexpected future losses⁽²⁾ and to provide sufficient capital adequacy even after buffers have been drawn down, then reducing capital requirements may help to maintain resilience through the indirect effects discussed above and support the FPC's secondary objective for growth and employment. But when it is judged that banks' ability to absorb future losses is insufficient and that there is a material risk that such losses could threaten the capital adequacy of the banking system, the direct decrease in resilience from a reduction in the CCB or SCRs would not support financial stability. Moreover, if banks find it hard or expensive to fund themselves at lower capital ratios, as was the situation facing a large number of banks internationally during this crisis, reducing the CCB or SCRs would have little effect on lending. In those circumstances, lending might be better supported through the alternative action of recommending that banks raise levels of capital to underpin investor confidence — though it would be important to consider other regulatory levers in parallel, including banks' liquidity requirements.

Decisions to reduce the CCB or SCRs may, therefore, be informed by assessing indicators of capital adequacy, including estimates of potential losses under stress (see below), market-based indicators of banks' resilience, credit conditions, and the outlook for growth and banks' profitability.

Taken together, these high-level considerations suggest that an appropriate set of indicators for the CCB and SCRs should include measures of balance sheet stretch, both within the financial system and amongst end-borrowers in the wider economy, and measures of terms and conditions in financial markets. They also highlight that the relative importance of different indicators is likely to vary depending on whether the FPC is considering an increase or reduction in capital requirements. **Tables C and D** on pages 38–40 list the FPC's current core indicators for the CCB and SCR tools respectively, provide working definitions for each indicator, and set out their latest values and historical benchmarks. These indicators are discussed in detail below and Box 3 on page 36 presents a case study assessing the performance of these indicators both prior to this crisis and in current conditions.

The indicators for the SCR tool are somewhat more granular in nature than those for the CCB tool, tending to focus on the broad sectors that the FPC might target. They may also act as a prompt for further analysis to determine whether risks are concentrated in particular subsectors, which cannot be covered by a short list of indicators. The FPC will also look beyond the aggregate and sector-level measures to examine whether changing patterns in the distribution of risks across banks, non-bank financial institutions, households or corporates, including those overseas, may signal rising risks, for example among a significant subset of institutions or borrowers. Since instability often follows periods of rapid change in the financial system, it will be important to consider significant changes in indicators alongside their absolute level.

The indicators may also be useful in judging whether or not policy has been effective. Success in this context means reducing the risk of a major disturbance to the financial system without having a significant adverse effect on the growth of the UK economy. The probability of a future systemic financial crisis cannot be readily observed. The success of the FPC's actions may, however, be partially assessed with reference to whether the indicators used to prompt and justify intervention evolve in ways that are more appropriate and sustainable. At the same time, it will also be important to consider whether other indicators have moved in an adverse way, given the risk of unintended consequences. For example, even if an increase in SCRs for a particular sector helped to curtail overextension in that sector, a shifting of risk to other sectors could potentially undermine the effect on system-wide resilience.

The role of projections and stress testing

The information in the indicators can also be used to inform the scenarios underlying stress-testing projections for system-wide financial sector profits, losses and balance sheet evolution, and so future capital and leverage ratios. Such projections can be made under both a central case, or

(1) See Basel Committee on Banking Supervision (2010c), page 3.

(2) That is, the losses banks may face in the event of an unlikely stress.

'baseline', scenario for the future evolution of economic and financial variables (for example, that which underlies the projections in the Bank of England's latest *Inflation Report*), and more adverse, or 'stress', scenarios that are likely to occur with lower probability. Top-down stress-test approaches place particular emphasis on system-wide effects, such as exposures to common risks and spillovers between different institutions, in contrast to microprudential stress tests which focus more closely on risks at individual institutions as, for example, conducted by the FSA (and, in future, the PRA) and the EBA.

The FPC sees attractions in stress testing as a tool for gauging risk to the financial system. It plans to consider the extent to which it will use top-down stress tests as part of its approach. As it develops its approach, working with the PRA, the FPC will need to decide how best to communicate the results of any stress tests. The FPC may use such exercises to indicate whether current financial resources are likely to provide a sufficient buffer against risks to the financial system, both in aggregate and in relation to particular sectors. This could highlight a need to increase the CCB or SCRs to lower the risk that particular stress scenarios might precipitate a financial crisis, or a need to loosen policy, perhaps because the external environment is stronger, risks have dissipated, or credit conditions are weak. The PRA will continue to use microprudential stress tests tailored to banks' particular risks to inform the setting of individual capital requirements, alongside a rounded judgement of business models, and the FPC will draw on such analysis as required when gauging its view of the resilience of the UK financial system.⁽¹⁾ But any stress tests conducted by the FPC and the PRA will be set in a way which aims to avoid capital being required twice against the same risk.

Stress tests vary in their methodology and complexity. A simple approach might just calculate the effect on bank capital from a high assumed loss rate across the system on a particular type of exposure. 'Reverse' stress tests, which aim to identify what might cause banks to fail, may be used to identify the key risks that might threaten the system at different points in time and could potentially be informed by what banks themselves judge would threaten their survival.⁽²⁾ More complex approaches still might attempt to model loss rates and consider amplification and feedback channels, such as contagion (the propagation of distress) among financial institutions; system-wide bank runs; and the link between banking sector resilience, credit conditions and the macroeconomy. Results then depend on the modelling choices made, some of which can be complex, and are subject to considerable uncertainty, especially since it is very difficult to model feedback channels quantitatively.⁽³⁾ More generally, all stress tests rely on suitably specified adverse scenarios, ideally also capturing risks emanating from outside the banking system. The FPC will be mindful that many of those applied by both regulators and banks prior to the current crisis

turned out to be insufficiently severe or too narrow, thus providing a false degree of assurance.⁽⁴⁾

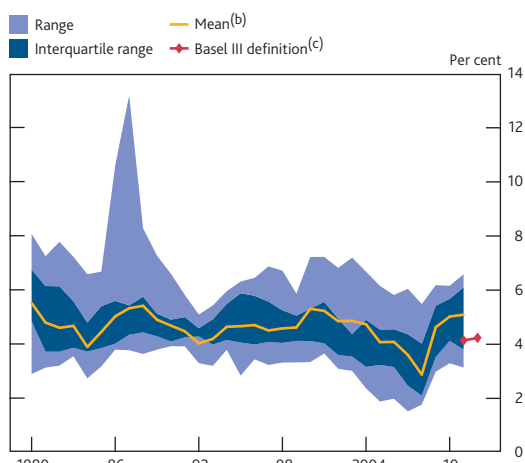
4.2 Core indicators for the countercyclical capital buffer⁽⁵⁾

Bank balance sheet stretch (indicators 1–8)

The aggregate **core Tier 1 capital ratio (1)** and **leverage ratios (2)** are natural indicators of banking system resilience, reflecting the amount of capital that the financial sector has available to absorb losses on its assets.⁽⁶⁾ Capital ratios are computed using measures of risk-weighted assets, where less weight is assigned to those assets that are deemed to be less risky, whereas leverage ratios assign all on balance sheet assets the same weight. A simple measure of the leverage ratio avoids any adjustments to the accounting definition of assets, some of which can be quite complex in nature. But some adjustments to assets may be helpful — for example, to capture both exposures held off balance sheet and the embedded leverage in derivatives, as well as to achieve comparability between banks subject to different accounting regimes. It is, therefore, important to consider the proposed international Basel III leverage ratio measure, which should capture these adjustments, alongside the simple leverage ratio measure. In addition, the relationship between risk-weighted assets and (unweighted) assets used for the core Tier 1 capital ratio and simple leverage ratio, as reflected in **average risk weights (3)**, also provides a gauge on the average riskiness of banks' assets.

A rapid build-up in leverage (ie a fall in leverage ratios) in major UK banks (**Chart 6**) was an important driver of the current financial crisis.⁽⁷⁾⁽⁸⁾ Risk-based core Tier 1 capital ratios

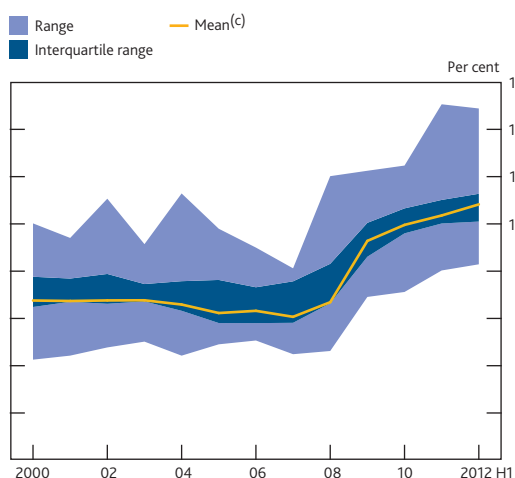
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- (1) On the PRA approach to stress testing and individual capital requirements, see Bank of England and Financial Services Authority (2012).
 - (2) The FSA currently requires banks to conduct reverse stress tests — see Financial Services Authority (2009b). The PRA intends to continue these requirements. As set out in Bank of England and Financial Services Authority (2012), the PRA will expect banks' senior management and boards to have an explicit understanding of the circumstances in which their bank might fail in order to develop appropriate management actions to allow it to withstand or, should it fail, mitigate the wider impact of any such failure.
 - (3) Stress-testing models remain under active development at the Bank of England and the FSA. See Burrows, Learmonth and McKeown (2012) and Financial Services Authority (2012).
 - (4) For example, based on information available in August 2008, International Monetary Fund (2008), page 5, concluded that 'stress tests suggest that the [Icelandic banking system] is resilient', just months before the subsequent collapse. See also Haldane (2009); and Borio, Drehmann and Tsatsaronis (2012).
 - (5) Many of the charts in this and the next subsection use shading to highlight episodes of financial stress in the United Kingdom: the secondary banking crisis from 1973 Q4 to 1975 Q4 (Reid (1982)); the small banks' crisis from 1990 Q3 to 1994 Q2 (Logan (2000)); and the current crisis from 2007 Q3.
 - (6) Note that banks' actual capital ratios may fluctuate relative to the CCB rate setting due to changes in voluntary buffers. Given that this indicator is closely related to the tools, it may, however, be particularly prone to behaving differently as the FPC starts to use the CCB and SCRs.
 - (7) Unless otherwise noted, 'major UK banks' as of 2012 refers to: Banco Santander, Bank of Ireland, Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group (LBG), National Australia Bank, Nationwide, Royal Bank of Scotland (RBS) and Virgin Money. For more details on the sample going backwards, see footnote (4) to **Tables C and D** on pages 38 and 40.
 - (8) Consistent with regulatory definitions, this Policy Statement defines leverage ratios by dividing the relevant measures of capital by assets (eg a leverage ratio of 4%) rather than the reverse (eg a leverage ratio of 25 times). But the discussion uses the standard English language interpretation of associating rising levels of leverage with greater indebtedness — under the definition used here, this is equivalent to a falling leverage ratio.

Chart 6 UK banks' leverage ratios^(a)

Sources: FSA regulatory returns, published accounts and Bank calculations.

- (a) The mean and ranges shown are based on the simple leverage ratio defined as the ratio of shareholders' claims to total assets based on banks' published accounts (note a discontinuity due to introduction of IFRS accounting standards in 2005, which tends to reduce leverage ratios thereafter). Data exclude Northern Rock/Virgin Money from 2008.
- (b) Weighted by total assets.
- (c) The 'Basel III leverage ratio', from end-2011 onwards, is calculated as aggregate peer group Tier 1 capital over aggregate leverage ratio exposure, according to the proposed Basel III definition. However, Tier 1 capital includes some 'grandfathered' instruments which will no longer be eligible after the full transition in 2019. The Basel III sample includes Barclays, HSBC, LBG, RBS, Nationwide, Santander UK and Co-operative Bank. Last data point is October 2012.

provided a relatively weaker signal in this instance, not changing materially during the upswing (**Chart 7**) as average risk weights fell. And, at the individual bank level, leverage ratios were a better predictor of banks that subsequently got into trouble in this crisis than risk-based capital ratios.⁽¹⁾ Banking sector leverage also rose prior to the Nordic crises in the late 1980s and early 1990s and ahead of a range of other crises.⁽²⁾ But it was less informative in signalling vulnerabilities prior to some other past episodes of banking sector distress in the United Kingdom or in the United States prior to the Latin American debt crisis of the 1980s.⁽³⁾

Chart 7 UK banks' core Tier 1 capital ratios^{(a)(b)}

Sources: Published accounts and Bank calculations.

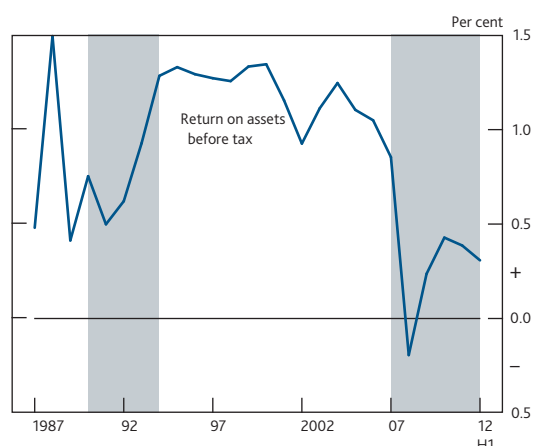
- (a) Major UK banks' core Tier 1 capital as a percentage of their risk-weighted assets. The series uses the major UK banks peer group as of 2012 H1 and their constituent predecessors. Data exclude Northern Rock/Virgin Money from 2008.
- (b) From 2008, the chart shows core Tier 1 ratios as published by banks, excluding hybrid capital instruments and making deductions from capital based on FSA definitions. Prior to 2008, that measure was not typically disclosed; the chart shows Bank calculations approximating it as previously published in the *Financial Stability Report*.
- (c) Weighted by risk-weighted assets.

If the FPC judges that prevailing or prospective capital ratios seem too low given its assessment of the risks, a possible response would be to increase the CCB rate applied to UK exposures. If, by contrast, capital ratios appeared adequate but leverage was growing, so that average risk weights were falling, further analysis would be necessary. Such developments could reflect relatively 'safe' balance sheet expansion — for instance, growth in mortgage lending at low LTV ratios — in which case policy action may not be required. They may also, however, reflect mis-measurement of risk weights or declining prudence in banks' risk management, signalling generalised over optimism about risks and a possible need to increase the CCB. At times, however, it may be simpler and more direct for the FPC to make a Recommendation that banks' leverage ratio standards are toughened relative to microprudential requirements. And if falling risk weights are due to developments in a particular sector, it may be more appropriate to apply the SCR tool (see Section 4.3).

The banking sector's aggregate pre-tax **return on assets (RoA) (4)** provides a simple, high-level view of the core profitability of the banking system. Since profits are the first line of defence against losses, weak profitability during periods of stress may indicate a reduced ability of the banking system to remain resilient in the face of threats, and thus a need to exercise caution in reducing the CCB rate applied to UK exposures. In expansions, large or prolonged movements in RoA could signal the emergence of underlying risks which would warrant further investigation to determine whether and how the CCB should be adjusted in response. For example, an increasing RoA may signal that banks are holding riskier assets, while a low and falling RoA, as seen in the United Kingdom from the late 1990s to 2007 (**Chart 8**), may signal that banks are taking on leverage to try to boost returns.

If banks' funding is too reliant on unstable sources, they may be highly vulnerable to system-wide bank runs. Unstable deposits are often those provided 'wholesale' by other financial institutions or capital markets, perhaps sourced from abroad, rather than retail deposits. Swings in the way banks finance themselves can also play a role in driving the broader credit cycle: for example, the growth of UK bank balance sheets prior to the current crisis was highly correlated with a rise in the proportion of funding sourced from short-term wholesale deposits.⁽⁴⁾ A high or rapidly increasing aggregate **loan to deposit ratio (5)** provides a simple measure of these risks, to which the FPC might respond by increasing the level of the CCB, though it may sometimes be simpler and more direct

- (1) See International Monetary Fund (2009b), Basel Committee on Banking Supervision (2010b) and Haldane and Madouros (2012).
- (2) See Box 3 of Bank of England (2009a) and Barrell *et al* (2010).
- (3) Tucker (2012b).
- (4) See Financial Services Authority (2009a). Hahn, Shin and Kwanho (2013) formulate a model of credit supply in which a high proportion of non-deposit funding can increase vulnerabilities and provide empirical support using data from emerging economies.

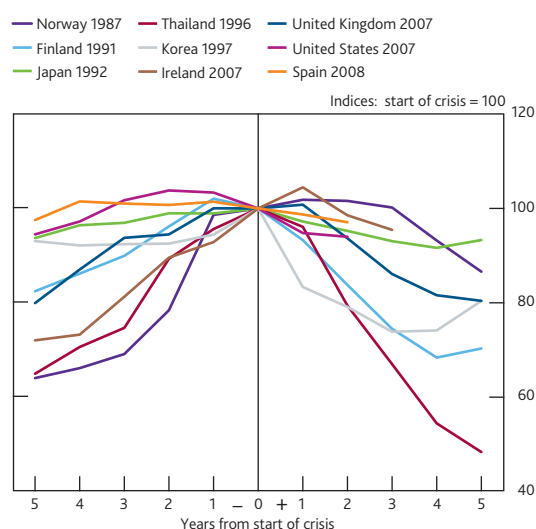
Chart 8 UK banks' return on assets before tax^(a)

Sources: Published accounts and Bank calculations.

(a) Calculated as major UK banks' net income (excluding tax) as a proportion of assets averaged over the current and previous year.

to make a Recommendation that banks' liquidity standards are toughened relative to microprudential requirements.⁽¹⁾

Rising loan to deposit ratios were evident in many countries prior to this crisis, and the indicator also performed well in signalling impending distress in some of the countries which suffered crises in East Asia in 1997–98 (Chart 9). At the same time, risks linked to the residency of the provider of funding, rather than the type of funding, point to the usefulness of national balance sheet indicators, as discussed further below. In addition, the loan to deposit ratio does not distinguish between the stability of different types of retail or wholesale funding. This highlights the importance of monitoring a range of measures linked to the stability of banks' funding, such as

Chart 9 Loan to deposit ratio before and after major crises^{(a)(b)}

Sources: World Bank, published accounts and Bank calculations.

(a) The years beside the country names give the dates of the first year of a banking crisis, based on Reinhart and Rogoff (2009).

(b) The UK measure is major UK banks' customer lending as a percentage of customer funding, where customer refers to all non-bank borrowers and depositors. Where disclosed, repurchase agreements are excluded from loans and deposits. The measure for all other countries is the 'Bank credit to bank deposits' series from the World Bank Global Financial Development database. In their measure of credit, the World Bank include the financial resources provided to the private sector by domestic money banks.

the simple growth in overall wholesale funding (see Section 4.3), the maturity of funding, and the ease with which assets may be liquidated in distress.

As Section 2 notes, the FPC can set a CCB rate to be applied to some foreign exposures. An **overseas exposure concentration indicator (6)**, highlighting system-wide banking sector exposures to foreign countries which are both significant relative to capital and growing rapidly, provides one simple means for the FPC to identify such vulnerabilities.⁽²⁾ At the first available data point at the end of 2005, this indicator would have flagged concerns over UK banks' exposures to several countries, including the United States and Spain, with Ireland flagged soon afterwards, reflecting the near doubling of UK banks' exposures in sterling terms between 2005 and 2007. Similar to market and supervisory intelligence, this indicator may be seen as a device for triggering deeper enquiries. In particular, on its own, it does not provide much insight into the riskiness of foreign exposures, so it is also important to consider measures of balance sheet stretch in those countries which are flagged. The indicator also fails to capture risks from indirect exposures via third countries — for example, UK banks were vulnerable to the Latin American debt crisis of the 1980s not only directly but also via their exposures to US banks that were suffering heavy losses. So where obvious risks in overseas countries (or groups of countries) are growing or crystallising, the FPC will assess UK banks' direct and indirect vulnerabilities, independent of the signal from this indicator.

Market-based metrics relating to bank debt (7) and bank equity (8) may provide insights on market participants' assessment of the health of banks. In relation to the former, spreads on senior unsecured debt and subordinated debt (including contingent capital instruments) relative to risk-free rates, and credit default swaps (CDS) on those instruments, can provide indicators of financial market participants' assessment of the likelihood of bank failure.⁽³⁾ While the FPC will consider all of these, measures relating to subordinated

- (1) One weakness of the FPC's current measure of the loan to deposit ratio is that it is not possible to distinguish between retail deposits from households and deposits placed by non-bank financial corporations on a consolidated basis. The FPC wishes to see improved data in this area.
- (2) This should not be confused with microprudential concentration risk at the level of the individual institution, for example when a single bank is heavily exposed to a particular country. Macroprudential concerns arise when the system is collectively overexposed to a particular country.
- (3) Senior unsecured debt spreads reflect the premium banks pay over risk-free rates to borrow from wholesale investors via unsecured bonds. Subordinated debt spreads are calculated as the difference between the yield on a risky bond (or contingent capital instrument that converts from debt to capital in certain circumstances) that sits between senior debt and capital in the credit hierarchy, and a risk-free bond of the same maturity. These are often interpreted as the premia paid to bond holders to compensate them for the risk of the underlying instruments defaulting. A CDS contract provides a contingent insurance-type payout to the holder of such protection if there is a default on the underlying referenced bond (which may be senior or subordinated), in exchange for a premium paid from the holder of protection to the seller. CDS premia may be used to gauge market perceptions of the probability of default, at least from the perspective of a so-called 'risk-neutral' investor, by equating the size of the known payments from the buyer to the seller with the uncertain payment from the seller to the buyer, where the latter is a combination of the expected payout in the case of default and the probability that this event occurs. If market participants are risk-averse, this approach may overstate the inferred probability of default.

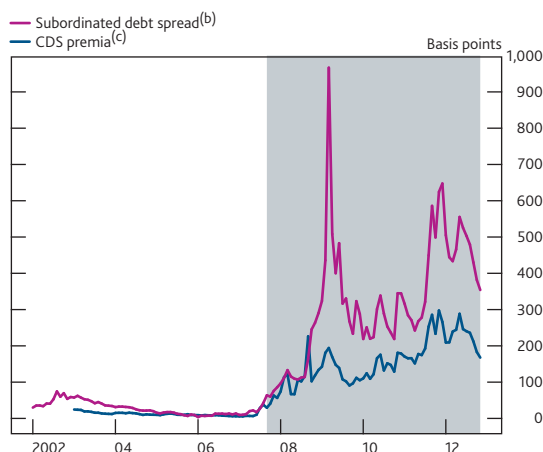
debt should provide a superior signal in principle because such instruments are more likely to incur losses than senior debt in the event of bank failure. This highlights the importance of considering **subordinated debt spreads**. But because CDS on senior debt are more widely traded than CDS on subordinated debt, they are the subject of closer attention in financial markets and their pricing may be more reliable, pointing towards the particular usefulness of the **CDS premia on senior debt**. The views of equity market investors may be gauged by considering the aggregate **price to book and market-based leverage ratios** of banks. The former measures the market value of equity relative to the book, or accounting, value of the difference between banks' assets and debt liabilities, thus reflecting, among other things, investor confidence in banks, their future earnings potential, and the accounting valuation of net assets.⁽¹⁾ The latter offers a market assessment of how well capitalised banks are relative to their assets given their future earnings prospects and risks. In the immediate run-up to this crisis, it proved a useful discriminator between banks that subsequently failed and those which survived.⁽²⁾

The interpretation of these indicators is likely to vary across the financial cycle. In some circumstances, they may be useful in gauging how the riskiness of banks is evolving during periods of stress. For example, a reduction in debt spreads or CDS premia, or a rise in price to book and market-based leverage ratios during a downturn may indicate that threats to resilience are receding, so that it may be appropriate to reduce the CCB back towards normal microprudential levels. Low price to book ratios may be useful in pointing towards the need to raise capital during periods of stress, though raising capital in these circumstances may be less commercially attractive than when price to book ratios are high. But, as market measures, all of these metrics can be subject to significant mispricing. They may simply mirror movements in broader market indices and reflect wider exuberance, as was the case immediately prior to this crisis when CDS premia and subordinated debt spreads were low and price to book and market-based leverage ratios were high (Charts 10 and 11). Conversely, they may reflect excessive pessimism at other points of the cycle, for example in a panic. Market-based indicators also provided relatively weak signals of impending distress prior to other crises, including, for example, the East Asian crisis of 1997–98, where sovereign spreads and rating agency credit assessments in early 1997 were more favourable, on average, in countries most affected by the subsequent crisis.⁽³⁾

Non-bank balance sheet stretch (indicators 9-13)

Box 2 discusses how rapid expansions in credit often precede crises and the role of the **credit-to-GDP (9)** gap and ratio of credit-to-GDP as potential indicators of the need to increase the CCB. But **nominal credit growth (10)** to the private non-financial sector has in the past tended to respond more quickly when the financial cycle turns, so may be a more

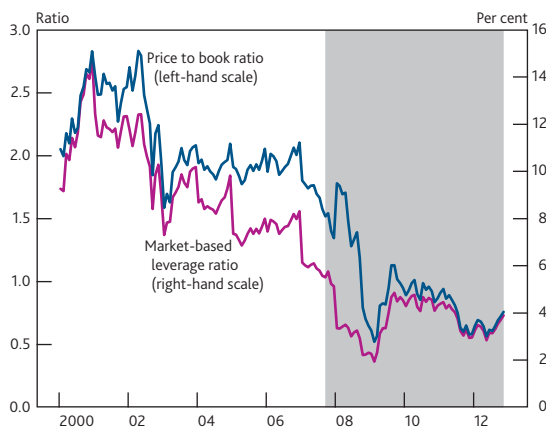
Chart 10 UK banks' senior CDS premia and subordinated debt spreads^(a)



Sources: Markit Group Limited, UBS Delta, published accounts and Bank calculations.

- (a) Average of major UK banks' five-year senior CDS premia and five-year euro-denominated subordinated debt spreads to swaps (including contingent capital instruments), weighted by end-year total assets.
- (b) Includes Nationwide from July 2003.
- (c) The sample includes the following financial groups: Banco Santander, Bank of Ireland, Barclays, HSBC, LBG and RBS.

Chart 11 UK banks' price to book and market-based leverage ratios^{(a)(b)}



Sources: Thomson Reuters Datastream, published accounts and Bank calculations.

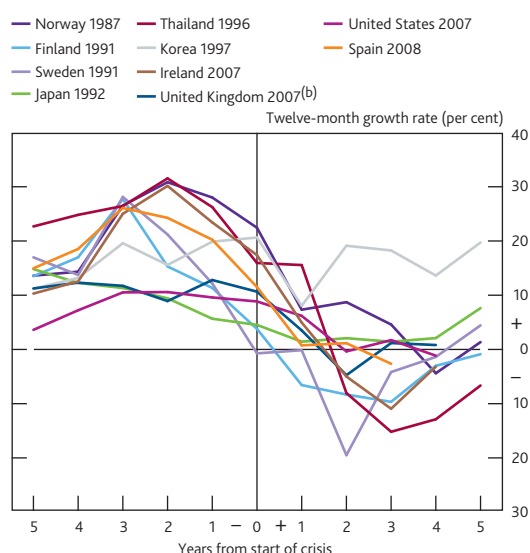
- (a) The price to book ratio relates the share price with the book, or accounting, value of shareholders' equity per share. Simple averages of the ratios in the peer group, weighted by end-year total assets, are shown. The market-based leverage ratio is defined as total peer group market capitalisation divided by total peer group assets (note a discontinuity due to introduction of IFRS accounting standards in 2005, which tends to reduce leverage ratios thereafter).
- (b) The sample comprises the major UK banks excluding Britannia, Co-operative Bank, and Nationwide. Northern Rock/Virgin Money are excluded from 2008.

timely indicator of the potential need to release the CCB. Strong nominal credit growth can also be a useful corroborative indicator of rising risks in the upswing, especially since it can speak directly to rising levels of indebtedness.⁽⁴⁾ It tends to precede many different crises (Chart 12 and Chart A in Box 2 on pages 28–29) — for example, private-sector credit

(1) See Box 2 of Bank of England (2012a).
 (2) Haldane and Madouros (2012). Consistent with the definition used for balance sheet leverage ratios, this Policy Statement defines market-based leverage ratios by dividing market capitalisation by assets rather than the reverse.
 (3) Berg, Borenstein and Pattillo (2005).
 (4) Koo (2008) and Reinhart and Rogoff (2009) discuss how rising levels of indebtedness may increase the potential for future instability. See Box 2 for further details. An important consideration in this regard is how credit moves relative to other nominal variables.

to residents in Ireland grew at an annual rate of over 20% between early 2004 and early 2008. But credit growth can be volatile. Hence, large imbalances in the stock of credit, as would be captured by credit-to-GDP measures, may be of greater concern than short periods of strong credit growth, which may sometimes cool down in an orderly fashion.⁽¹⁾

Chart 12 Nominal credit growth before and after major banking crises^(a)



Sources: IMF International Financial Statistics, ONS and Bank calculations.

(a) The years beside the country names give the dates of the first year of a banking crisis, based on Reinhart and Rogoff (2009).

(b) For the UK definition of credit please see Chart A in Box 2 on pages 28–29.

Credit measures provide indicators of the indebtedness of the UK private non-financial sector. But developments in the broader national balance sheet can also threaten financial stability.⁽²⁾ For example, excessive borrowing from abroad at the national level can expose a country to large and sudden capital outflows, creating vulnerabilities somewhat similar in nature to those generated by a high loan to deposit ratio in banks. In particular, foreign funding tends to be flightier than domestic debt both because foreign investors may be more likely to withdraw in periods of disturbance and because they may feel more comfortable investing at home during periods of global stress.⁽³⁾ In addition, excessive foreign financing can generate exchange rate risk if there is a mismatch in the currency denomination of the United Kingdom's claims and obligations. It may also play a role in driving domestic credit booms if external investors are searching for yield or otherwise have a high appetite for risk. Increasing capital requirements in such circumstances may, therefore, help to limit the potential fallout to the financial system from a sharp reduction in cross-border capital flows.

When assessing national balance sheets, it is important to consider both stocks of external assets and liabilities and the associated cross-border capital flows. Both net and gross measures matter.⁽⁴⁾ Net measures are useful for assessing the

sustainability of a country's spending patterns and risks to the exchange rate. Gross measures reveal the composition of assets and liabilities, and therefore patterns of financial intermediation and consequent vulnerabilities to a withdrawal of external funding.

In terms of stock measures, the economy's **net foreign asset position (11)**, reflecting the difference between gross external assets and liabilities, is important because a large negative position may reveal cumulative unsustainable patterns in spending that may eventually necessitate macroeconomic adjustment if a country is to be able to service its debts. This can be painful with deficit countries having to save more (relative to investment) and export more (relative to imports). Metrics of net external balance sheets do not, however, give a complete picture as they may mask material differences between the holders of external assets and liabilities or significant mismatch risks stemming from (unhedged) differences between the currency and maturity of external assets and liabilities.

It is, therefore, also important to consider **gross external liabilities (12)** relative to GDP (excluding derivatives) as well as gross external assets.⁽⁵⁾ Gross positions can transmit risks via the global financial network either from creditor to borrower countries or *vice versa*. The gross external liability position provides an overall picture of a country's reliance on external funding. Within that, high levels of debt financing, rather than, for example, foreign direct investment, may be of particular concern, especially if it is short-term and concentrated at banks and other financial institutions. But substantial gross external liabilities may be less problematic if they are balanced at the level of individual institutions by large gross external assets which could be readily used to meet prospective outflows. In the United Kingdom, the size of gross positions reflects, in part, 'entrepôt' financial activities in the City of London: in particular, a significant component of the resident banking system comprises foreign-owned banks whose main business is to intermediate global capital flows by borrowing and lending externally — for example, at end-2011 only around 30% of UK resident monetary financial institutions' (MFIs) external debt liabilities were accounted for by currency and deposits of UK-owned banks and building societies.⁽⁶⁾ That said, some foreign-owned banks located in

(1) See Drehmann, Borio and Tsatsaronis (2011).

(2) Senior and Westwood (2000) and Hoggarth, Mahadeva and Martin (2010).

(3) These patterns have been evident in a range of crises — see, for example, Hoggarth, Mahadeva and Martin (2010), Box 1 of Bank of England (2012b), Giannetti and Laeven (2012) and Hahm, Shin and Kwanho (2013).

(4) Cecchetti (2011) and Tucker (2012a).

(5) Although the growth rate in the notional value of derivatives on bank balance sheets is included as a distinct indicator in Section 4.3, derivative liabilities are excluded from this particular indicator given that they are rather different in nature to debt and equity capital, reflecting contingent liabilities that are dependent on underlying asset prices rather than actual current liabilities. Gross external assets may be derived directly from gross external liabilities and net foreign assets, adjusting appropriately for derivatives.

(6) This underestimates the share of external debt accounted for by UK-owned institutions, as data is not available to split securities held by non-residents between UK and foreign-owned MFIs.

Box 2

Credit-to-GDP indicators and the Basel III guidance

The Basel III agreement sets out a reference guide to foster a consistent approach to decision making on the CCB rate. It is based on the so-called credit-to-GDP gap indicator. This measures the amount of credit that has been extended to the household and corporate sectors divided by the level of GDP, with allowance made for potential shifts over time in the sustainable level, or trend, of that ratio.⁽¹⁾ The size of the credit gap is then translated into a guide for setting the CCB rate applied to exposures to a particular jurisdiction. The measure aims to capture whether credit in the economy is dangerously high and therefore warrants activating the CCB. Under the EU's draft CRD4/CRR, the FPC will be required to publish a guide broadly along these lines each quarter and explain its decisions on the CCB rate applied to UK exposures with reference to it. The ESRB, tasked with working out details, has yet to issue guidance on precisely how such a guide should be calculated.⁽²⁾

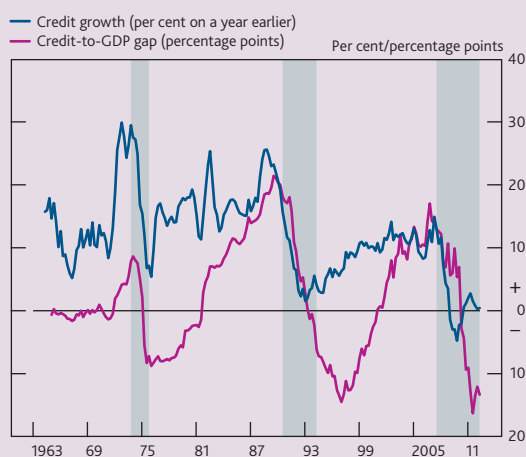
How well does the credit-to-GDP measure perform?

Credit booms tend to go hand in hand with rapid expansions in the balance sheets of banks and other leveraged financial institutions. Strong credit growth has characterised the build-up to many financial crises in history — this includes the Great Depression, the Nordic and Japanese crises of the late 1980s and early 1990s, many emerging market crises such as the East Asian crisis, and the current crisis in several developed countries.⁽³⁾

The credit-to-GDP gap as defined in Basel III has signalled emerging vulnerabilities in the United Kingdom prior to past crises (**Chart A**). Ahead of the current crisis, the reference guide would have pointed towards activating the CCB in 2002.⁽⁴⁾ It also suggests that the CCB should have been activated ahead of the secondary banking crisis in the 1970s and the small banks' crisis in the early 1990s. More generally, wider cross-country evidence over many different crises tends to support the conclusion that the credit-to-GDP gap is a useful leading indicator of crises.⁽⁵⁾

As the Basel III guidance notes, the measure may, however, be a poor indicator of the possible need to reduce the CCB in the face of deteriorating credit conditions as it typically continues to increase at the onset of a crisis. In particular, while GDP might decline rapidly, the stock of credit can be slow to fall, especially if companies draw on credit lines previously provided by financial institutions, highlighting the potential usefulness in looking at movements in its two components separately. The indicator may also be sensitive to the way the trend is computed which could limit its reliability. It may mask concerns arising from a sustained period of fast credit growth

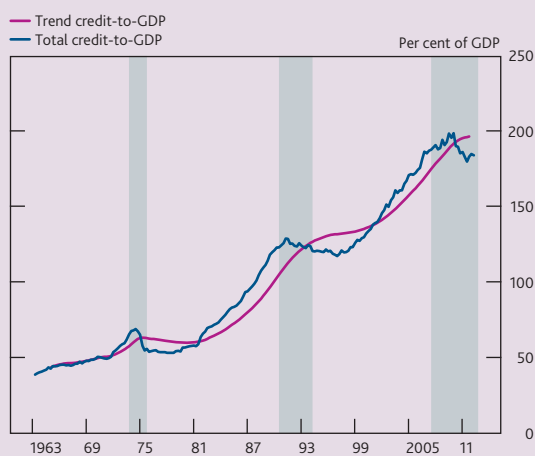
Chart A UK credit gap and credit growth^{(a)(b)(c)}



Sources: Bank of England, ONS 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. ONS data are not available before 1990. Before then, stable relationships between the ONS household and private non-financial corporation debt data and Bank of England household and private non-financial corporation lending data are assumed and the ONS household and private non-financial corporation debt series is assumed to grow at the same rate as the Bank of England household and private non-financial corporation lending series.
- (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.
- (c) Twelve-month growth rate of nominal credit.

Chart B UK credit-to-GDP ratio^(a)



Sources: Bank of England, ONS and Bank calculations.

- (a) Credit is defined as in **Chart A** and the credit-to-GDP trend is calculated as in **Chart A**.

that is potentially well in excess of nominal GDP growth because it will treat some of the expansion in credit as sustainable — for example, in **Chart B**, if the level of the credit-to-GDP ratio (blue line) had been exactly in line with the trend (magenta line) between the late 1990s and the current crisis, the credit-to-GDP gap indicator would have measured zero but the rise in the level of credit relative to GDP would have been of concern. Rising indebtedness may indicate the potential for future instability by making the economy more vulnerable to shocks and by increasing the deflationary effect of subsequent deleveraging. Indeed some empirical evidence suggests that aggregate leverage in the economy beyond a certain level may be harmful for stability.⁽⁶⁾

It is, therefore, important to complement the credit-to-GDP gap measure with other indicators — a point acknowledged in the Basel III guidance and in forthcoming EU legislation.⁽⁷⁾ It is in this spirit that the FPC will also consider credit-to-GDP levels in their own right (**Chart B**) and, more generally, has set out a complementary core set of indicators to sit alongside credit-to-GDP measures.

- (1) See Basel Committee on Banking Supervision (2010c). More specifically, the guide uses a broad definition of credit including all credit extended to households and private non-financial corporates (PNFCs) independent of its form and the identity of the supplier of funds. To calculate the credit-to-GDP gap, a smooth version of the credit-to-GDP ratio, ie its trend, is subtracted from the actual ratio. The trend is calculated using a backward-looking, one-sided Hodrick-Prescott filter, meaning that it can be calculated in real time. Edge and Meisenzahl (2011) argue that a trend derived from a two-sided Hodrick-Prescott filter would be closer to the 'true' trend, but this would not be available for policymakers in real time. They also look into the effect of data revisions on the credit-to-GDP gap. In the United Kingdom, data revisions tend not to have had a large impact on the measured gap.
- (2) Basel III suggests that a credit gap of 2 percentage points maps to a CCB rate of 0% and a credit gap of 10 percentage points to a CCB rate of 2.5%.
- (3) See Kindleberger (1989), Bank for International Settlements (2004), Koo (2008), Schularick and Taylor (2012) and Dell'Ariccia *et al* (2012).
- (4) While the broad credit series from the ONS is shown here in line with the Basel III suggestion, there are some concerns with the data on private non-financial corporations therein. A narrow measure based on Bank of England data provides a robustness check — it would have suggested activating the CCB in 2003.
- (5) See Borio and Lowe (2002), Alessi and Detken (2009) and Drehmann, Borio and Tsatsaronis (2011). Barrell and Karim (2012), however, find little evidence that the ratio of credit-to-GDP affects the incidence of crises in OECD countries, although they find some role in emerging market economies.
- (6) See Koo (2008) and Reinhart and Rogoff (2009). Arcand, Berkes and Panizza (2012) and Cecchetti and Kharroubi (2012) make a related point, linking leverage in the economy to output growth.
- (7) In particular, Recital 58 of the draft Council CRD4 text notes that the '[methodology on the basis of the ratio between credit and GDP] should serve as a common starting point for decisions on buffer rates by the relevant national authorities but should not give rise to an automatic buffer setting or bind the designated authority'.

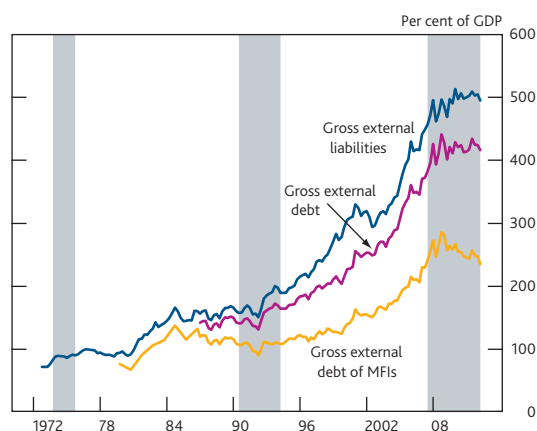
the United Kingdom are involved in lending to the UK real economy, with foreign branches having had a particular tendency to retrench on business lending during the current crisis. But since UK lending makes up only a relatively small fraction of their overall activity, the large gross external liabilities associated with these banks will probably exaggerate their direct relevance to the stable provision of financial services to the UK real economy. At the same time, gross external assets can pose a significant risk to creditor countries if the assets are particularly illiquid or risky and are financed by debt liabilities, or if there are significant foreign exchange mismatches between assets and liabilities. So if the United Kingdom exhibits a large build-up of gross external assets, it is important to consider what underlies it.

While stock measures can provide an important picture of the current position of the national balance sheet, flow measures are likely to be useful in identifying growing risks. These include measures of different types of gross capital flows, which are conceptually equivalent to the change in the relevant stock positions, adjusted for valuation effects stemming from movements in exchange rates and financial asset prices; and changes in net foreign assets, also adjusted for valuation effects, as measured by the **current account (13)**. Gross flows may help to capture a build-up in national funding risks, while the current account may be indicative of the extent to which domestic credit is being financed over and above domestic saving, and could reflect an economy which is borrowing and spending unsustainably.

Charts 13 and 14 show how national balance sheet indicators signalled vulnerabilities in the United Kingdom prior to the current crisis. Gross external liabilities rose particularly rapidly from about 2004, with a significant portion of this accounted

for by bank debt. And the United Kingdom's net foreign asset position deteriorated from the mid-1990s onwards, reflecting a persistent current account deficit. Adverse developments in national balance sheets have also been seen in other countries prior to crises. For example, some combination of large and persistent current account deficits (**Chart 15**) and high or rising external indebtedness were observed prior to the Latin American debt crisis of the 1980s, the East Asian crisis of 1997–98, and the more recent crises in the United States and some euro-area economies.⁽¹⁾ And the importance of monitoring gross external assets is highlighted by Germany's recent experience — while running a current account surplus,

Chart 13 UK gross external liabilities and debt^(a)

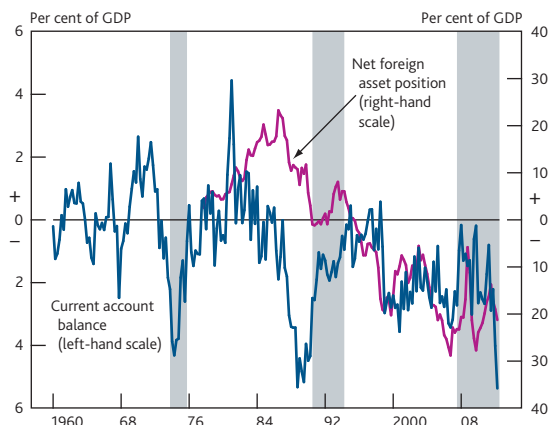


Sources: ONS and Bank calculations.

(a) Excluding derivatives. Non-debt liabilities are equity liabilities in the form of either foreign direct or portfolio investment. Ratios computed using a four-quarter moving sum of GDP. MFIs are monetary financial institutions, and cover banks and building societies resident in the United Kingdom.

- (1) More generally across a wide sample of countries, Reinhart and Reinhart (2008) and Barrell *et al* (2010) find that current account deficits are an important leading indicator of financial crises.

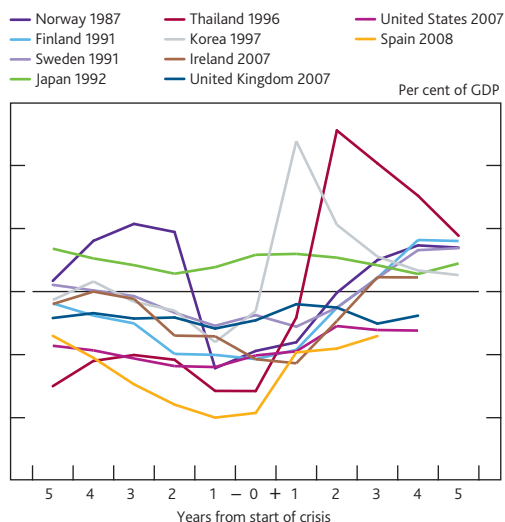
Chart 14 UK current account balance^(a) and net foreign asset position^(b)



Sources: ONS and Bank calculations.

(a) As per cent of quarterly GDP.
(b) As per cent of annual GDP (four-quarter moving sum).

Chart 15 Current account balances before and after major crises^(a)



Sources: IMF *World Economic Outlook*, October 2012, ONS and Bank calculations.

(a) The years beside the country names give the dates of the first year of a banking crisis, based on Reinhart and Rogoff (2009).

German banks built up exposure to the US sub-prime market in the early to mid-2000s, subsequently suffering significant losses on those assets. Some of these exposures were booked in German affiliates outside Germany, including in the United States, highlighting the importance of also looking at foreign exposures on a group consolidated basis, including the local as well as cross-border claims on foreign countries of domestically owned banks.

The shape of the United Kingdom's national balance sheet may sometimes be driven by developments outside the scope of the FPC, being influenced by changes in exchange rates and sometimes signalling incipient inflationary pressures. Also, even when the net foreign asset and current account positions look benign, domestic factors can still lead to banking system

distress. For example, Japan experienced a prolonged banking crisis throughout the 1990s despite running a persistent current account surplus both beforehand and contemporaneously (Chart 15).

In addition, all external balance sheet indicators are prone to significant measurement error and data revisions. That highlights the importance of developing better data in this area, and a need to exercise caution in interpreting movements in the series.

Conditions and terms in markets (indicators 14-17)

Exuberance often arises in the financial system when lenders and market participants switch into riskier activities in an effort to chase high returns. Given the presence of absolute return targets, including return on assets or return on equity, this may be more likely when the return on relatively safe assets, as might be reflected by the level of the **long-term real interest rate** (14) (ie the long-term interest rate adjusted for expected inflation), is low.⁽¹⁾ For example, low and falling long-term real interest rates prior to this crisis (Chart 16) — reflecting high global desired saving relative to investment, a shortage of safe assets and the possible effects of persistently accommodative monetary policy on expected real interest rates and term premia — may have played a role in driving the subsequent 'search for yield'.⁽²⁾ In such conditions, the FPC might therefore increase the CCB to build resilience. But the long-term real interest rate can move for many reasons, not all of which may generate financial stability risks. The FPC will need to assess the underlying reasons for such movements when considering the appropriate policy response.

Chart 16 UK long-term real interest rate^(a)



Sources: Bank of England and Bank calculations.

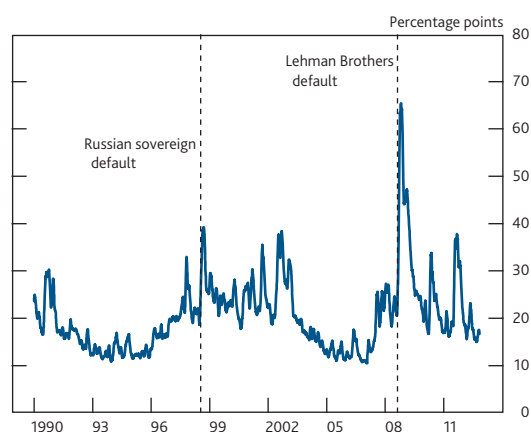
(a) Five-year real interest rates five years forward, derived from the Bank's index-linked government liabilities curve.

(1) For example, Borgy, Clerc and Renne (2009) find that a decrease in the long-term real interest rate increases the likelihood of asset price booms.
(2) Astley *et al* (2009), Bernanke *et al* (2011), King (2011), Hanson and Stein (2012) and Tucker (2012a).

Broad conditions in global capital markets can be indicative of overall levels of risk appetite and uncertainty in the financial system. These may be reflected both in metrics relating to equity markets, such as the **VIX (15)**, which captures expectations of stock market volatility; and those relating to debt markets, such as measures of **global spreads (16)** over risk-free rates, for example on corporate bonds or on collateralised and securitised debt. These measures are likely to be related, with compressed global debt spreads likely to reflect, and potentially be driven by, low levels of volatility and uncertainty. In such conditions, risk may be priced too cheaply, through a search for yield and compression of term and liquidity premia.⁽¹⁾ Self-reinforcing dynamics may emerge if flows into risky assets push down measured risk or temporarily improve liquidity, thereby prompting further asset reallocation. It may, therefore, be appropriate to increase the CCB in such circumstances since banks may subsequently be exposed to a dislocation in financial markets when the exuberance dissipates. By contrast, if expected volatility falls during a downturn in the financial cycle, this may point to a reduction in the risk of adverse outcomes and receding threats to banking system resilience and could, therefore, be a signal to reduce the CCB. The appropriate policy following a sharp reversal in risk appetite and rise in volatility following a period of exuberance may be harder to judge. It may signal a sharp tightening of credit conditions, which could suggest a need to reduce the CCB. But it would also be important to consider how such developments might affect the risk of direct losses to banks and uncertainty around that, as discussed in Section 4.1.

Charts 17 and 18 suggest that global risk appetite rose in the early to mid-2000s alongside investor expectations of a more benign economic environment, before subsequently reversing with the onset of distress in 2007. The connection between conditions in wider financial markets and threats to the banking system may, however, vary over time. These indicators need to be considered alongside measures of

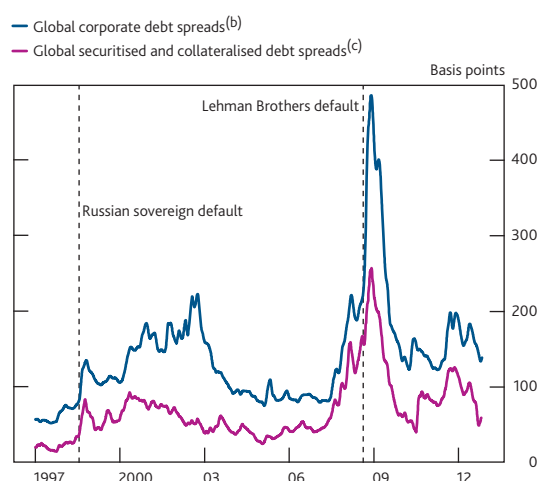
Chart 17 VIX^(a)



Sources: Bloomberg and Bank calculations.

(a) One-month moving average. The VIX is a measure of market expectations of 30-day volatility as conveyed by S&P 500 stock index options prices.

Chart 18 Global debt spreads^(a)



Sources: Bank of America Merrill Lynch, Bloomberg and Bank calculations.

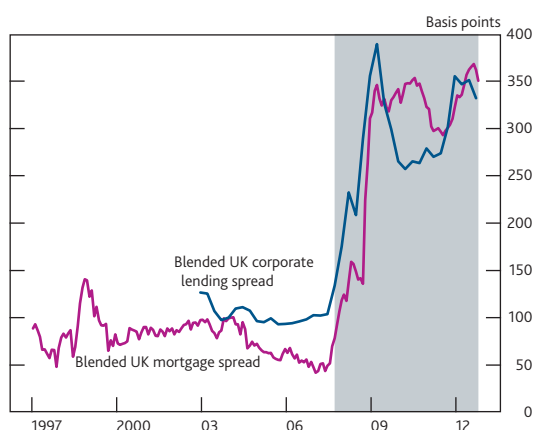
- (a) Option adjusted spreads, which are the number of basis points the matched-maturity government spot curve is shifted in order to match a bond's present value of discounted cash flows. One-month moving averages.
- (b) Global corporate debt spreads refers to the global broad market industrial spread. 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.
- (c) Global securitised and collateralised debt spreads refers to the global broad market collateralised spread. This tracks the performance of investment grade securitised and collateralised debt issued in major currencies, including mortgage-backed, asset-backed, commercial mortgage-backed, covered bond, Pfandbrief and US mortgage pass-through securities publicly issued in the major domestic and eurobond markets.

balance sheet stretch both within the banking system and outside it, and in light of the scale of direct and potential indirect exposure of banks to global capital markets.

Spreads on new lending (17) in the United Kingdom (ie the cost of borrowing relative to risk-free rates) provide a timely gauge of conditions in domestic loan markets. Rising lending spreads during periods of stress may highlight the potential need to reduce the CCB to try to mitigate a sharp contraction in credit, provided that such an action is consistent with the FPC's resilience objective. In expansions, considering spreads alongside changes in the quantity of credit may help to identify whether credit growth is largely driven by an increase in supply by financial institutions or by strong demand from households and businesses. The former may point to rising threats to financial stability and is likely to be suggestive of a need to increase the CCB; the latter may indicate overoptimistic assumptions about future income growth, with further analysis needed to identify whether this poses a risk to the financial system. For example, prior to this crisis, low and falling lending spreads in the corporate and household sectors (**Chart 19**) alongside rapid growth in the quantity of credit were indicative of a supply driven expansion; whereas the somewhat higher spreads during the previous credit expansion in the late 1980s, especially in the household sector, may have pointed towards a greater balance between supply and demand factors.⁽²⁾

(1) See Bank of England (2004) for a discussion of such developments prior to the current crisis.

(2) See Breedon and Joyce (1992) and Anderson (2004).

Chart 19 Indicative spreads on new UK lending^{(a)(b)}

Sources: Bank of America Merrill Lynch, Bank of England, Bloomberg, Council of Mortgage Lenders (CML), British Bankers' Association, De Montfort University and Bank calculations.

- (a) The mortgage spread is a weighted average of quoted mortgage rates over safe rates, using 90% LTV two-year fixed rate mortgages and 70% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products until August 2009, after which spreads are taken to OIS of matching maturity. Spreads are taken to Bank Rate for the tracker product.
- (b) The corporate lending spread is a weighted average of UK investment grade company bond spreads to gilts (adjusted for any embedded option features such as convertibility into equity), SME lending rates to Bank Rate and CRE lending rates to Bank Rate.

It should, however, be noted that lending spreads are affected by the degree of competition, which varies across different products in the United Kingdom, and a range of other factors which may not be linked to the financial cycle. In addition, data limitations and differences across types of borrower make it difficult to construct overall measures of loan spreads, particularly for the corporate sector, so it is important to analyse whether particular market segments are driving observed movements. In this regard, other information, such as the Bank of England's *Credit Conditions Survey*, is likely to provide useful intelligence on overall conditions in loan markets.

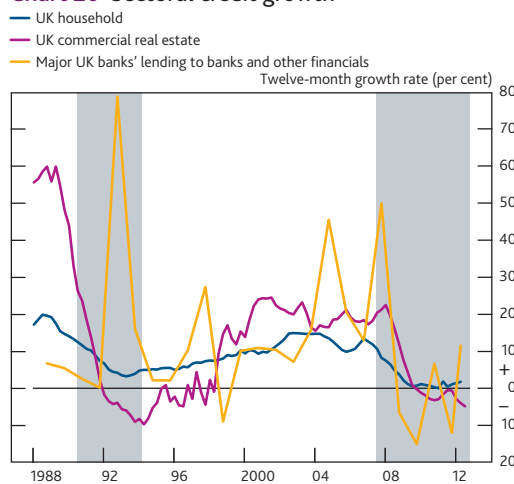
4.3 Core indicators for sectoral capital requirements

Bank balance sheet stretch (indicators 1-5)

The aggregate **core Tier 1 capital ratio (1)** and **leverage ratios (2)** can help the FPC to judge whether to adjust SCRs, as well as the CCB. As discussed in Section 4.2, the relationship between these indicators, as captured in average risk weights, is also informative in its own right. In principle, average risk weights in each of the three broad sectors to which the SCR tool may be applied are, therefore, natural indicators of sectoral risks on banks' balance sheets. While falling risk weights in a particular sector could reflect relatively 'safe' balance sheet expansion, they might also signal exuberance which would point towards a need to increase the SCR for that sector. The FPC will, therefore, consider the evolution of **average risk weights on mortgages (3)** and plans to extend this metric to commercial property and financial sector exposures when data availability improves.⁽¹⁾

A key reason for adjusting SCRs is to enhance resilience in response to material concentrations of risk on financial institution balance sheets. Collectively, UK banks will always be heavily exposed to the three sectors over which the

Government is proposing that the FPC has powers of Direction. But rapid growth in exposures could signal growing vulnerabilities either across a sector or within a particular part of it. For residential and commercial property lending, economy-wide measures of credit growth in those sectors, discussed further below, are likely to be highly correlated with growth in banking sector exposures. But risks to banks from connections with other financial sector players, or 'counterparties', arise from both lending and borrowing relationships, and from other activities such as trading and risk management, and including derivative transactions. If financial sector counterparties get into difficulty, they may not only precipitate direct losses to banks but could also contribute to funding pressures on them, as was the case when US money market mutual funds reduced their lending to the core banking system during the current crisis. This suggests that bank balance sheet measures of **the growth rates of intra-financial system lending and borrowing, and in the notional value of derivatives (4)** (supplemented with information and market intelligence on the counterparty risk created by derivative transactions) may help to gauge changing systemic risks from connections both among banks and between the banking sector and the rest of the financial system.⁽²⁾ For example, growth in intra-financial system lending was particularly pronounced in the United Kingdom prior to the current crisis and played a strong role in the subsequent collapse (**Chart 20**).

Chart 20 Sectoral credit growth^(a)

Sources: Bank of England, ONS, published accounts and Bank calculations.

- (a) Twelve-month nominal growth rate of credit. Household series includes all liabilities of the household and not for profit sector. Commercial real estate series includes UK-resident banks' and building societies' claims on the sector (including lending for development of buildings). Intra-financial series, derived from published accounts, includes lending to other banks and other financial corporations. The series is not adjusted for mergers/acquisitions. This contributes to large growth rates in some periods — eg 1992 (Midland/HSBC) and 2007 (RBS/ABN Amro) — as they can result in step changes in the size and interconnectedness of the major UK bank peer group.

- (1) Some data gaps will be filled when the United Kingdom implements COREP, the EU-wide harmonised supervisory capital reporting framework, when CRD4 comes into force.
- (2) The notional value of a derivative is the face amount that is used to calculate payments made on it. The intra-financial lending and borrowing, and notional derivatives series discussed in this Policy Statement are estimated based on published accounts disclosures. These disclosures are not currently sufficient to ensure that all intra-financial activity is included in these series, nor is it possible to be certain that no real-economy activity is included. Additional data collections would be required to improve the data in this area.

In relation to vulnerabilities created by concentrations of risk in foreign countries, the FPC will consider an extended version of the CCB **overseas exposure concentration indicator (5)** to highlight system-wide sectoral exposures to foreign countries which are both significant relative to capital and growing rapidly.⁽¹⁾ For example, this would have flagged concerns over UK banks' exposures to the US non-bank private sector in early 2006, and possibly earlier and specifically in the household sector had the relevant data been available at the time. Such a signal could then have facilitated a more thorough investigation of the underlying drivers of the vulnerability, which may have revealed sub-prime lending as a particular concern. The indicator should be viewed with the same caveats as the equivalent CCB indicator — for example, it would not have captured UK banks' indirect exposures to sub-prime mortgages, via their exposures to US banks and securities houses that were suffering heavy losses and via effects operating through international financial markets.

Non-bank balance sheet stretch (indicators 6-9)

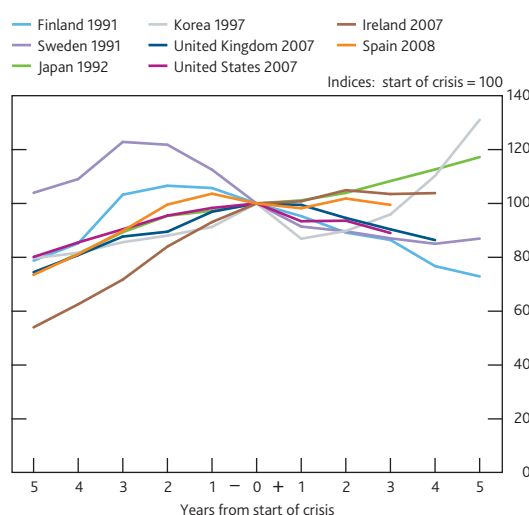
Section 4.2 discusses the role of credit expansions and contractions in the financial cycle. But such developments have often been concentrated in particular sectors. For example, commercial property lending was especially exuberant in the United Kingdom prior to this crisis, while lending to the UK real economy, especially to small and medium enterprises, has been particularly weak since the onset of stress (**Chart 20**). The Japanese crisis of the 1990s was preceded by rapid growth in lending across a number of sectors, including to consumers, the real estate industry and small and medium-sized enterprises, all of which reversed rapidly during the crisis. And in advance of the Nordic crises in the late 1980s and early 1990s, there was a boom in credit to the real economy, particularly in the household and commercial property sectors.⁽²⁾ This experience points towards the usefulness of **sectoral nominal credit growth (6)** as an indicator of both the potential need to raise SCRs during upswings and lower them during downswings.

Growth in real-economy credit and intra-financial sector connectivity may, however, be of greater concern when it is persistent and when borrowers or counterparties are heavily indebted. So indicators of balance sheet stretch in different sectors will be a useful complement. In particular, high indebtedness relative to the ability of households, businesses and financial institutions to generate income may pose systemic risks to the financial system, which could emerge if the economy enters a downturn and borrowers are no longer able to repay their debts or financial sector counterparties get into difficulty. This highlights the importance of considering: **household debt to income ratios (7)** in relation to SCRs on residential mortgage lending; the extent of **corporate gearing (8)** in relation to SCRs on commercial property lending, as measured by private non-financial corporations' debt to operating surplus ratio; and the **indebtedness of non-bank financial institutions (NBFIs) (9)** relative to GDP

(excluding insurance companies and pension funds) in relation to SCRs on financial sector exposures.⁽³⁾ It should, however, be noted that rising indebtedness may be less of a concern if financed by long-term investors using their own wealth rather than by leveraged financial institutions because any losses which then arise are less likely to be amplified. And, with all of these indicators, it may be difficult to disentangle slow-moving trends in indebtedness from cyclical swings. Although slow changes could be a cause for concern because fragility can increase even if indebtedness grows gradually, they might reflect non-threatening developments in the financial system.

The household debt to income ratio increased sharply in advance of a wide range of crises internationally, playing, for example, a key role in this financial crisis in the United States and Ireland (**Chart 21**).⁽⁴⁾ In the United Kingdom, the household debt to income ratio rose sharply prior to both the current crisis and the small banks' crisis of the early 1990s (**Chart 22**). UK banks have, however, experienced relatively limited losses on their household exposures to date during this crisis, in contrast to the early 1990s where widespread repossessions precipitated large losses at some financial institutions,⁽⁵⁾ although this also reflects the unusually

Chart 21 Household debt to income ratios around major crises^(a)



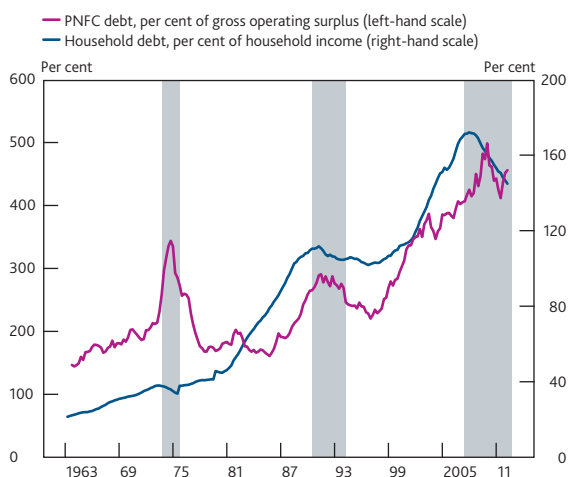
Sources: Bank of Finland, Bank of Japan, Bank of Korea, Economic and Social Research Institute (Japan), OECD, ONS, the Riksbank, Statistics Finland and Bank calculations.

(a) The ratio of the stock of household debt to household income. The definition of debt and income varies slightly from country to country, depending on data availability. The years beside the country names give the dates of the first year of a banking crisis, based on Reinhart and Rogoff (2009).

- (1) Overseas sectoral exposures cannot currently be broken down further than at the non-bank private sector level. The intention is to divide them into households and corporates when new data become available in 2014.
- (2) See Bank for International Settlements (2004); and, on Japan, Ichinose (1999) and Box 2 in Bank of England (2012b).
- (3) If measured relative to trend, these measures would be similar to sectoral versions of the credit-to-GDP gap indicator for the CCB. A related indicator which also captures interest payments would be a sector's debt service ratio. Drehmann and Juselius (2012) have found this to be a promising measure for signalling growing vulnerabilities.
- (4) On the US experience, see Mian and Sufi (2009, 2011).
- (5) See Bank of England (2012a).

accommodative stance of monetary policy. On the corporate side, gearing was also high in both the United Kingdom (Chart 22) and Ireland prior to this crisis. And very high levels of corporate indebtedness were evident in Japan in the late 1980s, playing a major role in the subsequent collapse.

Chart 22 UK household debt to income and corporate debt to profit ratios^(a)



Sources: Bank of England, ONS and Bank calculations.

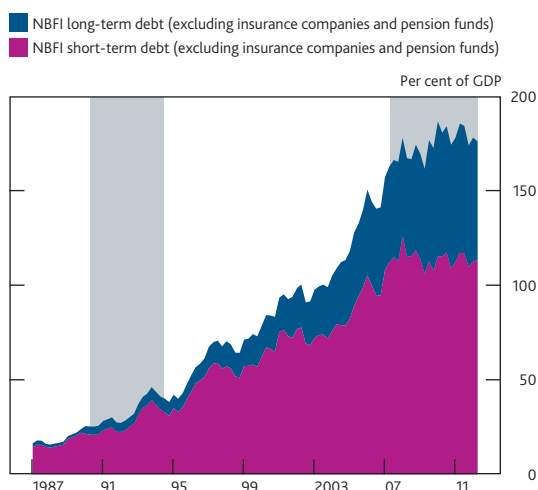
(a) Gross debt as a percentage of a four-quarter moving sum of disposable income and gross operating surplus of the respective sector. ONS data on household and private non-financial corporate (PNFC) debt are used from 1989 due to limited data availability. Before then, a stable relationship is assumed between the ONS debt data and the Bank of England lending data. The household disposable income and corporate gross operating surplus series are adjusted for financial intermediation services indirectly measured (FISIM).

Financial institutions accounted for some two thirds of the increase in the UK debt to GDP ratio between 2003 and 2007. In addition to banks, rising financial sector indebtedness was evident across a wide range of other financial institutions, instruments and structures replicating the core features of commercial banks but subject to less stringent regulation (the so-called 'shadow banking' sector). Such NBFIs may be highly vulnerable to shocks if they take on too much debt, particularly in the face of a high or increasing mismatch between short-term debt and longer-term assets, which increases the risk of bank runs.⁽¹⁾ And they can threaten the core banking system via both direct connections and indirect effects operating through disruption to wider financial markets, highlighting the need for frequent analysis and market intelligence to understand the nature of these connections and how they vary across different NBFIs.

The indebtedness of UK NBFIs, excluding insurance companies and pension funds, and the proportion of that debt which is short term (Chart 23), provides one source of high-level information on changing systemic risks emanating from the shadow banking sector.⁽²⁾ The indicator is, however, an imperfect measure. Its UK focus reflects current data constraints but broader, global developments in shadow banking are also likely to be a key area of attention for the FPC as UK banks are highly integrated into the global financial network. Given the diversity of shadow banks, and NBFIs more

generally, it will also be important to look beyond movements in the headline indicator to consider which particular types of activity or institution might be driving changes in the size and nature of indebtedness. To facilitate this, the FPC will seek to develop further indicators in this area and wishes to see improved 'flow of funds' data that track financial flows around the system.

Chart 23 UK NBFi debt (excluding insurance companies and pension funds)^(a)



Sources: ONS and Bank calculations.

(a) The non-bank financial intermediary and financial auxiliary (NBFi) sector includes all financial corporations apart from monetary financial institutions (ie deposit taking institutions). This indicator additionally excludes insurance companies and pension funds.

Conditions and terms in markets (indicators 10-12)

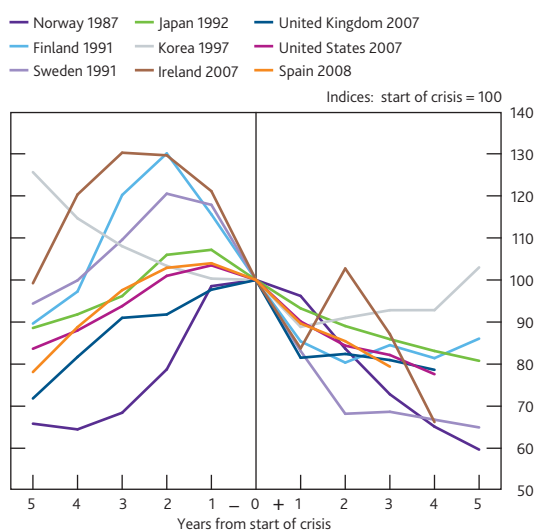
Strong growth in bank lending may be of particular concern when accompanied by exuberance in property markets. Rapidly rising **residential and commercial property prices (10)** have signalled impending stress across many countries, often peaking 1–2 years in advance of crises (Chart 24). Recent experience in the United States, Spain and Ireland has illustrated how corrections in credit-funded housing booms can have significant adverse implications for the wider economy.⁽³⁾ And, over past decades in the United Kingdom, peaks in the deviation of house prices relative to income, rent or the long-term trend of prices have all tended to precede crises. The same is true of commercial property prices (Chart 25).

Property price measures may, therefore, be useful in gauging the need to increase SCRs on mortgage and commercial property lending and also the need to reduce them, given that they may adjust rapidly with the onset of stress. At the same time, such measures can often appear elevated for long periods, so it may be difficult to use them to identify the appropriate time to increase SCRs. It is also difficult to identify

(1) These risks typically arise less in the case of insurance companies or pension funds, explaining their exclusion from the indicator.

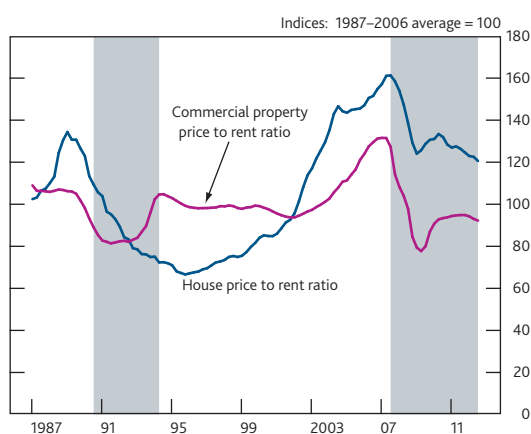
(2) Financial Stability Board (2012a, 2012b) discuss the risks from shadow banking and a range of possible indicators which may be used for monitoring the sector.

(3) See also Barrell *et al* (2010) and Drehmann, Borio and Tsatsaronis (2011).

Chart 24 House price to rent ratios around major crises^(a)

Sources: Halifax, Nationwide, OECD Economic Outlook database, ONS and Bank calculations.

(a) The years beside the country names give the dates of the first year of a banking crisis, based on Reinhart and Rogoff (2009).

Chart 25 UK real estate indicators^{(a)(b)}

Sources: Halifax, Investment Property Databank (IPD), Nationwide, ONS and Bank calculations.

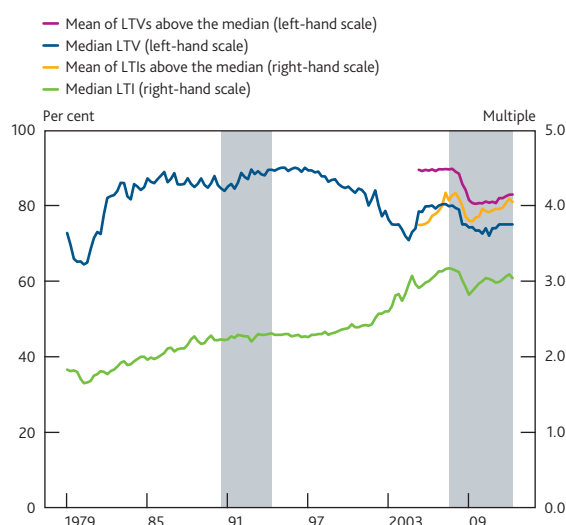
(a) The residential house price to rent index is the ratio between an average of the Halifax and Nationwide house price indices and RPI housing rent.
 (b) The commercial property price to rent index is the ratio between the IPD All Property Capital Growth Index and IPD All Property Rental Value Index. This series has been corrected from the original hard copy after the discovery of an error.

what might represent an appropriate 'equilibrium' level or trend. So, while the core indicator set uses price to rent ratios to gauge the sustainability of property prices, it may be particularly informative in this case to consider a range of complementary indicators of property prices.

Swings in property markets often go hand in hand with changes in mortgage availability.⁽¹⁾ Although the provision of some individual mortgages with high LTV or LTI ratios may be appropriate, excessive average LTV ratios have been a feature of the build-up to several financial crises. For example, risky mortgages played a major role in contributing to the US property boom prior to this crisis, with higher LTV ratios also subsequently associated with higher default rates.⁽²⁾

Tracking movements in **LTV and LTI ratios on new mortgages (11)** may, therefore, provide a guide as to whether

SCRs on residential mortgage lending, including at the more granular level of high LTV or high LTI lending, might need to be adjusted. There is, however, less evidence of LTV ratios on new mortgages rising materially in the United Kingdom prior to this crisis or the early 1990s crisis, though LTI ratios were a better indicator of impending distress (**Chart 26**) and a coincidence of high LTVs and high LTIs may generate particular concerns. Since it is the upper end of the distribution of LTVs and LTIs that tends to create financial stability risks, the indicators selected are based on the average LTV and LTI in the top half of the distribution.

Chart 26 UK loan to value and loan to income ratios on new mortgages^(a)

Sources: CML, FSA Product Sales Database and Bank calculations.

(a) Excludes remortgages.

As discussed in Section 4.2, **spreads on new lending (12)** provide a timely gauge of credit conditions in lending markets. They may be used as indicators for the SCR tool in a very similar way as for the CCB tool, but also taking account of the distinction between mortgage and corporate lending spreads. In relation to corporate credit conditions, information on spreads may be usefully supplemented by wider information on lending terms, including the extent of covenant restrictions and LTV ratios on commercial real estate (CRE) lending.⁽³⁾

Similar considerations highlight the importance of considering the terms, conditions and pricing of lending and financing transactions in wholesale financial markets when setting SCRs on financial sector exposures. For example, margin requirements on secured lending transactions between financial institutions, which have some similarities to an LTV ratio, fell prior to the current crisis as conditions became

(1) For example, Crowe *et al* (2011) find a relationship between high LTV ratios and high house price growth.

(2) Geanakoplos (2010).

(3) Such information might include supervisory intelligence, such as the FSA's recent review of CRE markets, and survey data, such as contained in the De Montfort University's semi-annual Commercial Property Lending Report.

Box 3

Indicators and the current crisis: a case study

Taken as a whole, how well does the proposed indicator set perform in pointing to the need to have increased the CCB rate applied to UK exposures and SCRs in the United Kingdom prior to this crisis? And what do they suggest currently? As discussed in the main text, most of the core indicators pointed towards rising threats prior to the crisis — indeed, **Tables C and D** on pages 38–40 highlight several sharp differences from historical benchmarks by 2006. But it should also be acknowledged that these indicators have been identified with the benefit of hindsight. And while some of the indicators were showing warning signs in 2004 and 2005, with rising exposures to US households also evident, the overall picture was relatively less clear-cut. Coupled with publication lags for some data series, this highlights the risk that the indicators might not signal vulnerabilities sufficiently in advance of crises, emphasising the importance of applying judgement. In addition, while flagging higher-level concerns, intra-financial sector lending growth and the concentration indicator would not have directly identified some of the more granular subsectors that contributed to the crisis, such as particular types of financial sector exposure or US sub-prime. And movements in capital ratios, market-based measures of bank debt and LTV ratios on new mortgages failed to suggest rising vulnerabilities altogether (see **Charts 7, 10 and 26** respectively).

Compared with some of these measures, other indicators would have been more helpful in signalling increasing threats to resilience. For example, at the sectoral level, the easing of covenant restrictions on corporate lending or the fall in the quality of collateral required on wholesale secured lending between financial institutions may have pointed towards

exuberance in those sectors.⁽¹⁾ Market intelligence had also identified some of the early indications of exuberance and rapid innovation in financial markets that subsequently contributed to the crisis. This included observations that investors and financial institutions were willing to take greater risks to preserve or increase financial returns in a search for yield, including by increasing leverage and buying potentially illiquid assets; and of vulnerabilities in the credit derivatives market, some of which were linked to efforts by investment banks to enhance the return on some of these securities.⁽²⁾

Tables C and D also present current values of the core indicators, illustrating how they can appear to suggest conflicting policy stances. This emphasises the particular difficulties in setting macroprudential policy in the current environment and reiterates the importance of applying judgement, and assessing alternative indicators, rather than mechanically relying on the core indicators to guide policy. For example, weak credit growth at aggregate and sectoral levels, the negative credit-to-GDP gap and elevated spreads on new lending might signal a potential need for policy loosening. But such action would reduce banks' ability to absorb losses arising from other sources in the future at a time when there are heightened sovereign and banking sector risks in some euro-area countries; banks' profitability is expected to remain weak; and investor confidence in banks, as judged, for example, by elevated CDS premia, remains low.⁽³⁾ Importantly, current policy challenges are also a reflection of the fact that the CCB and SCR tools were not in place to be increased before this crisis, and microprudential capital requirements were at a lower level than those mandated under Basel III.

(1) Bank of England (2005) discussed the easing of corporate credit conditions.

(2) See Rule (2001) and Bank of England (2004).

(3) See Bank of England (2012b).

buoyant before spiking sharply with the emergence of concerns over sub-prime and complex securities.⁽¹⁾ At present, there are limited regular information sources on such measures but the FPC wishes to see better data in this area and relevant indicators may be added to the core set as data availability and quality improve. In the meantime, the FPC will consider other sources of information on developments in this area, including market intelligence and surveys.⁽²⁾

5 Conclusion

Effective macroprudential policy tools are important to the FPC's ability to meet its objectives. The Government has consulted on its proposals to make the FPC responsible for policy decisions on the CCB in the United Kingdom and to give

the FPC Direction power over SCRs. This draft Policy Statement sets out how the FPC envisages each tool working, discusses their likely prospective impact on financial stability and economic growth, and explains the circumstances in which the FPC might expect to adjust the setting of each tool.

The draft Policy Statement has been prepared by the interim FPC in advance of the creation of the statutory FPC. It is a draft of the Policy Statement that the statutory FPC will produce to meet the requirement placed on it by the legislation to prepare and maintain general statements of policy for its Direction-making powers. Publication of the statement in draft is designed to assist Parliament's scrutiny of draft secondary legislation. As experience of operating the regime grows, the Policy Statement will be reviewed and updated by the FPC from time to time.

(1) Committee on the Global Financial System (2010) and Geanakoplos (2010). When the cash lent on repo trades is lower than the current market value of the security used as collateral, the discount is referred to as the haircut. Haircuts therefore act as the inverse of leverage. Conversely, the term 'margin' is used to describe the level of overcollateralisation required. If a firm lends £95 in cash against collateral of £100, the discount of 5% on the collateral is referred to as the haircut. The equivalent margin would be 5.26% ($5/95 \times 100$).

(2) A key improvement will be the Bank of England's forthcoming *Bank Liabilities Survey* that will provide information on financing conditions in wholesale funding and wider capital markets. On margins, the International Swaps and Derivatives Association publishes an annual survey on margins in over-the-counter (OTC) derivatives markets, and the International Capital Markets Association conducted a study of haircuts and initial margins in the repo market in February 2012. But such surveys and studies currently only provide a partial view on margins/haircuts in relevant markets. Several initiatives aim to improve data in this area (see Financial Stability Board (2012a, 2012b)). The Bank will also have access to data on margins applied to OTC derivatives cleared by those CCPs that fall under its new oversight responsibilities, as well as the collateral haircuts applied by those CCPs.

Table C Core indicator set for the countercyclical capital buffer⁽¹⁾

Indicator	Average, 1987–2006 ⁽²⁾	Average 2006 ⁽³⁾	Maximum since 1987 ⁽²⁾	Minimum since 1987 ⁽²⁾	Latest value
Bank balance sheet stretch⁽⁴⁾					
1 Core Tier 1 capital ratio ⁽⁵⁾	6.6%	6.3%	10.8%	6.1%	10.8% (2012 H1)
2 Leverage ratio ⁽⁶⁾					
Simple	4.7%	4.1%	5.4%	2.9%	5.1% (2011)
Basel III	n.a.	n.a.	n.a.	n.a.	4.2% (Oct. 2012)
3 Average risk weights ⁽⁷⁾	53.6%	46.2%	65.4%	35.2%	35.2% (2012 H1)
4 Return on assets before tax ⁽⁸⁾	1.0%	1.0%	1.5%	-0.2%	0.3% (2012 H1)
5 Loan to deposit ratio ⁽⁹⁾	114.0%	132.4%	133.4%	96.0%	106.4% (2012 H1)
6 Overseas concentration indicator: countries to which UK banks have 'large' and 'rapidly growing' total exposures ⁽¹⁰⁾		In 2006 Q4: BR, CH, CN, ES, FR, IE, IN, LU, NL			In 2012 Q2: DE, JP, NL
7 Bank debt measures					
CDS premia ⁽¹¹⁾	12 bps	8 bps	298 bps	6 bps	168 bps (Nov. 2012)
Subordinated spreads ⁽¹²⁾	29 bps	10 bps	967 bps	4 bps	354 bps (Nov. 2012)
8 Bank equity measures					
Price to book ratio ⁽¹³⁾	2.14	1.97	2.83	0.52	0.76 (Nov. 2012)
Market-based leverage ratio ⁽¹⁴⁾	9.6%	7.8%	14.8%	1.9%	3.9% (Nov. 2012)
Non-bank balance sheet stretch					
9 Credit-to-GDP ⁽¹⁵⁾					
Ratio	131.8%	179.1%	198.4%	93.8%	183.7% (2012 Q2)
Gap	4.2%	13.0%	21.4%	-16.3%	-13.3% (2012 Q2)
10 Private non-financial sector credit growth ⁽¹⁶⁾	10.8%	10.1%	25.6%	-4.7%	0.4% (2012 Q2)
11 Net foreign asset position to GDP ⁽¹⁷⁾	-4.7%	-26.4%	21.6%	-28.8%	-22.5% (2012 Q2)
12 Gross external liabilities to GDP ⁽¹⁸⁾	245.2%	419.6%	513.2%	146.1%	494.8% (2012 Q2)
<i>of which debt to GDP</i>	205.5%	351.0%	441.2%	130.8%	416.0% (2012 Q2)
<i>of which bank debt to GDP</i>	134.6%	210.6%	285.8%	90.5%	235.4% (2012 Q2)
13 Current account balance to GDP ⁽¹⁹⁾	-2.0%	-2.9%	0.6%	-5.4%	-5.4% (2012 Q2)
Conditions and terms in markets					
14 Long-term real interest rate ⁽²⁰⁾	3.09%	1.25%	5.14%	0.02%	0.04% (Nov. 2012)
15 VIX ⁽²¹⁾	19.1	12.8	65.4	10.6	16.7 (Nov. 2012)
16 Global spreads ⁽²²⁾					
Corporate bond spreads ⁽²³⁾	115 bps	87 bps	486 bps	52 bps	139 bps (Nov. 2012)
Collateralised and securitised debt spreads ⁽²⁴⁾	50 bps	46 bps	257 bps	15 bps	63 bps (Nov. 2012)
17 Spreads on new UK lending					
Mortgage lending ⁽²⁵⁾	81 bps	56 bps	368 bps	42 bps	351 bps (Oct. 2012)
Corporate lending ⁽²⁶⁾	103 bps	98 bps	389 bps	93 bps	332 bps (2012 Q3)

(1) A spreadsheet of the series shown in this table is available at www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx.

(2) If the series starts after 1987, the average between the start date and 2006 and the maximum/minimum since the start date are used.

(3) 2006 was the last complete non-crisis year.

(4) Unless otherwise stated, indicators are based on the major UK bank peer group defined as: Abbey National (until 2003); Alliance & Leicester (until 2007); Bank of Ireland (from 2005); Bank of Scotland (until 2000); Barclays; Bradford & Bingley (from 2001 until 2007); Britannia (from 2005 until 2008); Co-operative Bank (from 2005); Halifax (until 2000); HBOS (from 2001 until 2008); HSBC (from 1992); Lloyds TSB/Lloyds Banking Group; Midland (until 1991); National Australia Bank (from 2005); Nationwide; National Westminster (until 1999); Northern Rock (until 2011); Royal Bank of Scotland; Santander (from 2004); TSB (until 1994); Virgin Money (from 2012) and Woolwich (from 1990 until 1997). Accounting changes, eg the introduction of IFRS in 2005 result in discontinuities in some series. Restated figures are used where available.

(5) Major UK banks' aggregate end-year core Tier 1 capital as a percentage of their aggregate end-year risk-weighted assets. The series starts in 2000 and uses the major UK banks peer group as of 2012 H1 and their constituent predecessors. Data exclude Northern Rock/Virgin Money from 2008. From 2008, core Tier 1 ratios are as published by banks, excluding hybrid capital instruments and making deductions from capital based on FSA definitions. Prior to 2008, that measure was not typically disclosed and Bank calculations approximating it as previously published in the FSR are used. Sources: Published accounts and Bank calculations.

(6) A simple leverage ratio calculated as aggregate end-year peer group equity (shareholders' claims) over aggregate end-year peer group assets (note a discontinuity due to the introduction from 2005 of IFRS accounting standards, which tends to reduce reported leverage ratios thereafter) and, in addition from 2011, a series corresponding to the proposed Basel III definition from FSA regulatory returns (aggregate peer group Tier 1 capital over aggregate leverage ratio exposure). Tier 1 capital includes some 'grandfathered' instruments which will no longer be eligible after the full transition to Basel III in 2019. Note that the simple series excludes Northern Rock/Virgin Money from 2008, and the Basel III series consists of Barclays, HSBC, Lloyds Banking Group, RBS, Nationwide, Santander UK and Co-operative Bank. Sources: FSA regulatory returns, published accounts and Bank calculations.

(7) Calculated dividing aggregate end-year peer group risk-weighted assets by aggregate end-year peer group assets. Series begins 1992. Sources: Published accounts and Bank calculations.

(8) Calculated as major UK banks' annual net income (excluding tax) as a proportion of total assets, averaged over the current and previous year. 2012 H1 value is annualised. Sources: Published accounts and Bank calculations.

(9) Major UK banks' end-year customer lending as a percentage of end-year customer funding, where customer refers to all non-bank borrowers and depositors. Repurchase agreements are excluded from loans and deposits where disclosed. One weakness of the current measure is that it is not possible to distinguish between retail deposits from households and deposits placed by non-bank financial corporations on a consolidated basis. Additional data collections would be required to improve the data in this area. The series begins in 2000. Sources: Published accounts and Bank calculations.

(10) This indicator counts the number of countries where UK-owned monetary financial institutions' overall exposures are greater than 10% of UK-owned monetary financial institutions' tangible equity on an ultimate risk basis and have grown by 10% or more as a proportion of UK-owned monetary financial institutions' tangible equity during the previous year. Foreign exposures as defined in BIS consolidated banking statistics. Tangible equity figures for 2005–07 are estimated. Series begins in 2005 Q4. Countries flagged in 2006 Q4 were Brazil (BR), Switzerland (CH), People's Republic of China (CN), Spain (ES), France (FR), Ireland (IE), India (IN), Luxembourg (LU) and the Netherlands (NL). Countries flagged in 2012 Q2 were Germany (DE), Japan (JP) and the Netherlands (NL). Sources: Bank of England, published accounts and Bank calculations.

(11) Average of major UK banks' five-year senior CDS premia, weighted by total assets. Series starts in 2003. Includes Nationwide from July 2003. Sources: Markit Group Limited, published accounts and Bank calculations.

(12) Average of UK banks' five-year euro-denominated subordinated debt spreads to swaps, weighted by total assets. Includes contingent capital instruments. Sample includes the following financial groups: Banco Santander, Bank of Ireland, Barclays, HSBC, LBG and RBS. Series starts in 2002. Sources: UBS Delta, published accounts and Bank calculations.

(13) Relates the share price with the book, or accounting, value of shareholders' equity per share. Simple averages of the ratios in the peer group, weighted by end-year total assets. The sample comprises the major UK banks excluding Britannia, Co-operative Bank and Nationwide. Northern Rock and Virgin Money are excluded from 2008. Series starts in 2000. Sources: Thomson Reuters Datastream, published accounts and Bank calculations.

(14) Total peer group market capitalisation divided by total peer group assets (note a discontinuity due to introduction of IFRS accounting standards in 2005, which tends to reduce leverage ratios thereafter). The sample comprises the major UK banks excluding Britannia, Co-operative Bank, and Nationwide. Northern Rock/Virgin Money are excluded from 2008. Series starts in 2000. Sources: Thomson Reuters Datastream, published accounts and Bank calculations.

(15) Credit is defined 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. ONS data are not available before 1990. Before then, stable relationships between the ONS household and private non-financial corporation debt data and Bank of England household and private non-financial corporation lending data are assumed and the ONS household and private non-financial corporation debt series is assumed to grow at the same rate as the Bank of England household and private non-financial corporation lending series. 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. Sources: Bank of England, ONS and Bank calculations.

(16) Twelve-month growth rate of nominal credit. Credit is defined as above. Sources: Bank of England, ONS and Bank calculations.

(17) As per cent of annual GDP (four-quarter moving sum). Sources: ONS and Bank calculations.

- (18) Excluding derivatives. Non-debt liabilities are equity liabilities in the form of either foreign direct or portfolio investment. Ratios computed using a four-quarter moving sum of GDP. MFIs are monetary financial institutions, and cover banks and building societies resident in the United Kingdom. Sources: ONS and Bank calculations.
- (19) As per cent of quarterly GDP. Sources: ONS and Bank calculations.
- (20) Five-year real interest rates five years forward, derived from the Bank's index-linked government liabilities curve. Source: Bank of England.
- (21) The VIX is a measure of market expectations of 30-day volatility as conveyed by S&P 500 stock index options prices. Series starts in 1990. One-month moving averages. Sources: Bloomberg and Bank calculations.
- (22) Option adjusted spreads, which are 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 averages.
- (23) Global corporate bond 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. The series starts in 1997. Sources: Bank of America Merrill Lynch, Bloomberg and Bank calculations.
- (24) Global securitised and collateralised debt spreads refers to the global broad market collateralised spread. This tracks the performance of investment-grade securitised and collateralised debt, including mortgage backed, asset backed, commercial mortgage backed, covered bond, pfandbrief and US mortgage pass-through securities publicly issued in the major domestic and eurobond markets. Qualifying currencies are US dollars, Australian dollars, Canadian dollars, euros, Japanese yen, sterling; subject to minimum size requirements. The series starts in 1997. Sources: Bank of America Merrill Lynch, Bloomberg and Bank calculations.
- (25) The UK mortgage spread is a weighted average of quoted mortgage rates over safe rates, using 90% LTV two-year fixed rate mortgages and 70% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products until August 2009, after which spreads are taken to OIS of matching maturity. Spreads are taken to Bank Rate for the tracker product. Series starts in 1997. Sources: Bank of England, CML and Bank calculations.
- (26) The UK corporate lending spread is a weighted average of: SME lending rates over Bank Rate; CRE lending rates over Bank Rate; and, as a proxy for the rate at which banks lend to large, non-CRE corporates, UK investment grade company bond spreads over maturity-matched government bond yields (adjusted for any embedded option features such as convertibility into equity). Series starts in 2002 Q4. Sources: Bank of England, Bank of America Merrill Lynch, BBA, Bloomberg, De Monfort University and Bank calculations.

Table D Core indicator set for sectoral capital requirements⁽¹⁾

Indicator	Average, 1987–2006 ⁽²⁾	Average 2006 ⁽³⁾	Maximum since 1987 ⁽²⁾	Minimum since 1987 ⁽²⁾	Latest value
Bank balance sheet stretch⁽⁴⁾					
1 Core Tier 1 capital ratio ⁽⁵⁾	6.6%	6.3%	10.8%	6.1%	10.8% (2012 H1)
2 Leverage ratio ⁽⁶⁾					
Simple	4.7%	4.1%	5.4%	2.9%	5.1% (2011)
Basel III	n.a.	n.a.	n.a.	n.a.	4.2% (Oct. 2012)
3 Average mortgage risk weights ⁽⁷⁾	n.a.	n.a.	22.5%	18.9%	22.5% (2012 H1)
4 Balance sheet interconnectedness ⁽⁸⁾					
Intra-financial lending growth ⁽⁹⁾	13.9%	12.9%	78.7%	-15.0%	11.5% (2012 H1)
Intra-financial borrowing growth ⁽¹⁰⁾	14.6%	14.0%	37.3%	-18.4%	-4.9% (2012 H1)
Derivatives growth (notional) ⁽¹¹⁾	37.7%	34.2%	67.5%	-18.0%	-5.3% (2011)
5 Overseas concentration indicator: countries to which UK banks have 'large' and 'rapidly growing' non-bank private sector exposures ⁽¹²⁾		In 2006 Q4: ES, FR, IE, JP, NL			In 2012 Q2: none
Non-bank balance sheet stretch					
6 Credit growth					
Household ⁽¹³⁾	10.1%	11.6%	19.9%	0.0%	1.8% (2012 Q2)
Commercial real estate ⁽¹⁴⁾	15.3%	18.4%	59.8%	-9.7%	-4.8% (2012 Q3)
7 Household debt to income ratio ⁽¹⁵⁾	115.1%	160.6%	172.1%	88.0%	144.9% (2012 Q2)
8 PNFC debt to profit ratio ⁽¹⁶⁾	285.4%	391.3%	498.6%	189.2%	456.1% (2012 Q2)
9 NBFi debt to GDP ratio (excluding insurance companies and pension funds) ⁽¹⁷⁾	64.2%	144.1%	186.5%	15.8%	176.0% (2012 Q2)
of which short-term	49.7%	98.6%	125.8%	14.2%	113.3% (2012 Q2)
Conditions and terms in markets					
10 Real estate price to rent indices					
Residential ⁽¹⁸⁾	100.0	151.0	161.3	66.6	120.6 (2012 Q3)
Commercial ⁽¹⁹⁾	100.0	128.1	131.6	77.7	92.2 (2012 Q3)
11 Residential mortgage terms					
Loan to value ratio ⁽²⁰⁾	n.a.	89.4%	89.7%	80.4%	82.9% (2012 Q2)
Loan to income ratio ⁽²⁰⁾	n.a.	3.9	4.2	3.7	4.0 (2012 Q2)
12 Spreads on new lending					
Mortgage lending ⁽²¹⁾	81 bps	56 bps	368 bps	42 bps	351 bps (Oct. 2012)
Corporate lending ⁽²²⁾	103 bps	98 bps	389 bps	93 bps	332 bps (2012 Q3)

(1) A spreadsheet of the series shown in this table is available at www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx.

(2) If the series starts after 1987, the average between the start date and 2006 and the maximum/minimum since the start date are used.

(3) 2006 was the last complete non-crisis year.

(4) Unless otherwise stated, indicators are based on the major UK bank peer group defined as: Abbey National (until 2003); Alliance & Leicester (until 2007); Bank of Ireland (from 2005); Barclays; Bank of Scotland (until 2000); Bradford & Bingley (from 2001 until 2007); Britannia (from 2005 until 2008); Co-operative Bank (from 2005); Halifax (until 2000); HBOS (from 2001 until 2008); HSBC (from 1992); Lloyds TSB/Lloyds Banking Group; Midland (until 1991); National Australia Bank (from 2005); Nationwide; National Westminster (until 1999); Northern Rock (until 2011); Royal Bank of Scotland; Santander (from 2004); TSB (until 1994); Virgin Money (from 2012) and Woolwich (from 1990 until 1997). Accounting changes, eg the introduction of IFRS in 2005 result in discontinuities in some series. Restated figures are used where available.

(5) Major UK banks' aggregate end-year core Tier 1 capital as a percentage of their aggregate end-year risk-weighted assets. The series starts in 2000 and uses the major UK banks peer group as of 2012 H1 and their constituent predecessors. Data exclude Northern Rock/Virgin Money from 2008. From 2008, core Tier 1 ratios are as published by banks, excluding hybrid capital instruments and making deductions from capital based on FSA definitions. Prior to 2008, that measure was not typically disclosed and Bank calculations approximating it as previously published in the FSR are used. Sources: Published accounts and Bank calculations.

(6) A simple leverage ratio calculated as aggregate end-year peer group equity (shareholders' claims) over aggregate end-year peer group assets (note a discontinuity due to the introduction from 2005 of IFRS accounting standards, which tends to reduce reported leverage ratios thereafter) and, in addition from 2011, a series corresponding to the proposed Basel III definition from FSA regulatory returns (aggregate peer group Tier 1 capital over aggregate leverage ratio exposure). Tier 1 capital includes some 'grandfathered' instruments which will no longer be eligible after the full transition to Basel III in 2019. Note that the simple series excludes Northern Rock/Virgin Money from 2008, and the Basel III series consists of Barclays, HSBC, Lloyds Banking Group, RBS, Nationwide, Santander UK and Co-operative Bank. Sources: FSA regulatory returns, published accounts and Bank calculations.

(7) Sample excludes Bank of Ireland; Britannia; National Australia Bank; Northern Rock; and Virgin Money. Average risk weights for residential mortgages calculated as total risk-weighted assets divided by total exposure value for all banks in the sample. Calculated on a consolidated basis, except for Barclays before 2011 H2 where only solo data were available. Series starts in 2008. Sources: FSA regulatory returns and Bank calculations.

(8) The disclosures the series are based on are not currently sufficient to ensure that all intra-financial activity is included in these series, nor is it possible to be certain that no real-economy activity is included. Additional data collections would be required to improve the data in this area. The intra-financial lending and borrowing growth series are not adjusted for mergers/acquisitions. This contributes to large growth rates in some periods — eg 1992 (Midland/HSBC) and 2007 (RBS/ABN Amro) — as they can result in step changes in the size and interconnectedness of the major UK bank peer group.

(9) Lending to other banks and other financial corporations, annual series. Sources: published accounts and Bank calculations.

(10) Wholesale borrowing, composed of deposits from banks and non-subordinated securities in issue. One weakness of the current measure is that it is not possible to distinguish between retail deposits from households and deposits placed by financial corporations on a consolidated basis. Sources: Published accounts and Bank calculations.

(11) Based on notional value of derivatives (some of which may support real-economy activity). The sample includes Barclays, HSBC and RBS who account for a significant share of UK banks' holdings of derivatives, though the sample could be adjusted in future should market shares change. Series starts in 2002. Sources: Published accounts and Bank calculations.

(12) This indicator counts the number of countries where UK-owned monetary financial institutions' non-bank private sector exposures are greater than 10% of UK-owned monetary financial institutions' tangible equity on an ultimate risk basis and have grown by 10% or more as a proportion of UK-owned monetary financial institutions' tangible equity during the previous year. Foreign exposures as defined in BIS consolidated banking statistics. Overseas sectoral exposures cannot currently be broken down further than at the non-bank private sector level. The intention is to divide them into households and corporates when new data become available, which is expected to be in 2014. Tangible equity figures for 2005–07 are estimated. Series begins in 2005 Q4. Countries flagged in 2006 Q4 were Spain (ES), France (FR), Ireland (IE), Japan (JP) and the Netherlands (NL). Sources: Bank of England, published accounts and Bank calculations.

(13) Twelve-month nominal growth rate of total household and not-for-profit sector liabilities. Series starts in 1988. Sources: ONS and Bank calculations.

(14) Twelve-month nominal growth rate of UK-resident banks' and building societies' claims on the commercial real estate sector. Includes lending for development of buildings. Series starts in 1988. Sources: Bank of England and Bank calculations.

(15) Gross debt as a percentage of a four-quarter moving sum of disposable income. Includes all liabilities of the household sector. ONS data on household debt are used from 1989 due to limited data availability. Before then, a stable relationship is assumed between the ONS debt data and the Bank of England lending data. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM). Sources: Bank of England, ONS and Bank calculations.

(16) Gross debt as a percentage of a four-quarter moving sum of gross operating surplus. Gross debt is measured as loans and debt securities excluding derivatives, direct investment loans and loans secured on dwellings. ONS data on private non-financial corporate (PNFC) debt are used from 1989 due to limited data availability. Before then, a stable relationship is assumed between the ONS debt data and the Bank of England lending data. The corporate gross operating surplus series is adjusted for financial intermediation services indirectly measured (FISIM). Sources: Bank of England, ONS and Bank calculations.

(17) Gross debt as a percentage of four-quarter moving sum of nominal GDP. Includes all liabilities of non-bank financial institutions (NBFi), excluding insurance companies and pension funds. Sources: ONS and Bank calculations.

(18) The residential house price to rent index is the ratio between an average of the Halifax and Nationwide house price indices and RPI housing rent. Sources: Halifax, Nationwide, ONS and Bank calculations.

(19) The commercial property price to rent index is the ratio between the IPD All Property Capital Growth Index and the IPD All Property Rental Value Index. This series has been corrected from the original hard copy after the discovery of an error. Sources: Investment Property Databank and Bank calculations.

(20) Average loan to value/loan to income ratio on new advances above the median excluding remortgages. Series start in 2005. Sources: FSA Product Sales Database and Bank calculations.

(21) The UK mortgage spread is a weighted average of quoted mortgage rates over safe rates, using 90% LTV two-year fixed rate mortgages and 70% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products until August 2009, after which spreads are taken to OIS of matching maturity. Spreads are taken to Bank Rate for the tracker product. Series starts in 1997. Sources: Bank of England, CML and Bank calculations.

(22) The UK corporate lending spread is a weighted average of: SME lending rates over Bank Rate; CRE lending rates over Bank Rate; and, as a proxy for the rate at which banks lend to large, non-CRE corporates, UK investment grade company bond spreads over maturity-matched government bond yields (adjusted for any embedded option features such as convertibility into equity). Series starts in 2002 Q4. Sources: Bank of England, Bank of America Merrill Lynch, BBA, Bloomberg, De Monfort University and Bank calculations.

References

- Aiyar, S, Calomiris, C and Wieladek, T (2012), 'Does macropru leak? Evidence from a UK policy experiment', *Bank of England Working Paper No. 445*.
- Alessi, L and Detken, C (2009), 'Real time early warning indicators for costly asset price boom/bust cycles: a role for global liquidity', *ECB Working Paper No. 1039*.
- Anderson, S (2004), *The CML mortgage market manifesto: taking the past into the future*, London: Council of Mortgage Lenders.
- Arcand, J, Berkes, E and Panizza, U (2012), 'Too much finance', *IMF Working Paper WP/12/161*.
- Astley, M, Giese, J, Hume, M and Kubelec, C (2009), 'Global imbalances and the financial crisis', *Bank of England Quarterly Bulletin*, Vol. 49, No. 3, pages 178–90.
- Bank for International Settlements (2004), 'Bank failures in mature economies', *Working Paper No. 13*.
- Bank of England (2004), *Financial Stability Review*, December.
- Bank of England (2005), *Financial Stability Review*, June.
- Bank of England (2009a), *Financial Stability Report*, June.
- Bank of England (2009b), 'The role of macroprudential policy: a discussion paper', November.
- Bank of England (2011), 'Instruments of macroprudential policy: a discussion paper', December.
- Bank of England (2012a), *Financial Stability Report*, June.
- Bank of England (2012b), *Financial Stability Report*, November.
- Bank of England and Financial Services Authority (2012), 'The PRA's approach to banking supervision', PRA approach documents, October.
- Barrell, R, Davis, E P, Karim, D and Liadze, I (2010), 'Bank regulation, property prices and early warning systems for banking crises in OECD countries', *Journal of Banking and Finance*, Vol. 34, No. 9, pages 2,255–64.
- Barrell, R and Karim, D (2012), 'Macro prudential policy and credit; the right question but the wrong answer', *mimeo*.
- Basel Committee on Banking Supervision (2009), *Enhancements to the Basel II framework*, July.
- Basel Committee on Banking Supervision (2010a), *An assessment of the long-term economic impact of stronger capital and liquidity requirements*, August.
- Basel Committee on Banking Supervision (2010b), *Calibrating regulatory minimum capital requirements and capital buffers: a top-down approach*, October.
- Basel Committee on Banking Supervision (2010c), *Guidance for national authorities operating the countercyclical capital buffer*, December.
- Berg, A, Borensztein, E and Pattillo, C (2005), 'Assessing early warning systems: how have they worked in practice?', *IMF Staff Papers*, Vol. 52, No. 3, pages 462–502.
- Bernanke, B, Bertaut, C, DeMarco, L and Kamin, S (2011), 'International capital flows and the returns to safe assets in the United States, 2003–2007', *International Finance Discussion Paper No. 1014*, Board of Governors of the Federal Reserve System.
- Board of Governors of the Federal Reserve System (2009a), 'The supervisory capital assessment program: overview of results', Washington: Board of Governors, 7 May.
- Board of Governors of the Federal Reserve System (2009b), Press Release regarding the Supervisory Capital Assessment Program (SCAP), 9 November.
- Borgy, V, Clerc, V and Renne, J-P (2009), 'Asset-price boom-bust cycles and credit: what is the scope of macroprudential regulation?', *Banque de France Working Paper No. 263*.
- Borio, C, Drehmann, M and Tsatsaronis, K (2012), 'Stress-testing macro stress testing: does it live up to expectations?', *BIS Working Paper No. 369*.
- Borio, C and Lowe, P (2002), 'Assessing the risk of banking crises', *BIS Quarterly Review*, pages 43–54.
- Breedon, F and Joyce, M (1992), 'House prices, arrears and possessions', *Bank of England Quarterly Bulletin*, May, pages 173–79.
- Burrows, O, Learmonth, D and McKeown, J (2012), 'RAMSI: a top-down stress-testing model', *Bank of England Financial Stability Paper No. 17*.
- Cecchetti, S (2011), 'Global imbalances: current accounts and financial flows', remarks prepared for the Myron Scholes Global Markets Forum, 27 September 2011.
- Cecchetti, S and Kharroubi, E (2012), 'Reassessing the impact of finance on growth', *BIS Working Paper No. 381*.
- Cerra, V and Saxena, S (2008), 'Growth dynamics: the myth of economic recovery', *American Economic Review*, Vol. 98, No. 1, pages 439–57.
- Committee on the Global Financial System (2010), 'The role of margin requirements and haircuts in procyclicality', *CGFS Publications No. 36*.
- Committee on the Global Financial System (2012), 'Operationalising the selection and application of macroprudential instruments', *CGFS Publications No. 48*.

Council of the European Union (2012a), 'Council general approach on the proposal for a directive of the European Parliament and of the Council on the access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms and amending Directive 2002/87/EC of the European Parliament and of the Council on the supplementary supervision of credit institutions, insurance undertakings and investment firms in a financial conglomerate', 2011/0203 (COD), available at <http://register.consilium.europa.eu/pdf/en/12/st10/st10100.en12.pdf>.

Council of the European Union (2012b), 'Council general approach on the proposal for a regulation of the European Parliament and of the Council on prudential requirements for credit institutions and investment firms', 2011/0202 (COD), available at <http://register.consilium.europa.eu/pdf/en/12/st10/st10099.en12.pdf>.

Crowe, C, Rabanal, P, Igan, D and Dell'Ariccia, G (2011), 'How to deal with real estate booms: lessons from country experiences', *IMF Working Paper No. 11/91*.

Dell'Ariccia, G, Igan, D, Laeven, L, Tong, H, Bakker, B and Vandenbussche, J (2012), 'Policies for macrofinancial stability: how to deal with credit booms', *IMF Staff Discussion Notes No. 12/06*.

Drehmann, M, Borio, C and Tsatsaronis, K (2011), 'Anchoring countercyclical capital buffers: the role of credit aggregates', *International Journal of Central Banking*, Vol. 7, No. 4, pages 189–240.

Drehmann, M and Juselius, M (2012), 'Do debt service costs affect macroeconomic and financial stability?', *BIS Quarterly Review*, September, pages 21–35.

Edge, R and Meisenzahl, R (2011), 'The unreliability of credit-to-GDP ratio gaps in real-time and the implications for countercyclical capital buffers', *International Journal of Central Banking*, Vol. 7, No. 4, pages 261–98.

Elliott, D (2009), 'Quantifying the effects on lending of increased capital requirements', *Pew Financial Reform Project Briefing Papers*, No. 7.

European Parliament (2012a), 'Draft European Parliament legislative resolution on the proposal for a directive of the European Parliament and of the Council on the access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms and amending Directive 2002/87/EC of the European Parliament and of the Council on the supplementary supervision of credit institutions, insurance undertakings and investment firms in a financial conglomerate', 2011/0203 (COD). Available at www.europarl.europa.eu/sides/getDoc.do?type=REPORT&mode=XML&reference=A7-2012-0170+0+DOC+PDF+V0//EN.

European Parliament (2012b), 'Draft European Parliament legislative resolution on the proposal for a regulation of the European Parliament and of the Council on prudential requirements for credit institutions and investment firms', 2011/0202 (COD). Available at www.europarl.europa.eu/sides/getDoc.do?type=REPORT&mode=XML&reference=A7-2012-171&language=EN.

Financial Services Authority (2009a), *The Turner review: a regulatory response to the global banking crisis*, March.

Financial Services Authority (2009b), 'Stress and scenario testing', *Policy Statement PS09/20*, December.

Financial Services Authority (2012), *Business Plan 2012/13*, March.

Financial Stability Board (2012a), *Strengthening oversight and regulation of shadow banking: a policy framework for strengthening oversight and regulation of shadow banking entities*, 18 November.

Financial Stability Board (2012b), *Global shadow banking monitoring report 2012*, 18 November.

Francis, W and Osborne, M (2012), 'Capital requirements and bank behavior in the UK: are there lessons for international capital standards?', *Journal of Banking and Finance*, Vol. 36, No. 3, pages 803–16.

Geanakoplos, J (2010), 'Solving the present crisis and managing the leverage cycle', *Federal Reserve Bank of New York Economic Policy Review*, August, pages 101–31.

Giannetti, M and Laeven, L (2012), 'Flight home, flight abroad and international credit cycles', *American Economic Review*, Vol. 102, No. 3, pages 219–24.

Hahm, J, Shin, H and Kwanho, S (2013), 'Non-core bank liabilities and financial vulnerability', *Journal of Money, Credit and Banking*, forthcoming.

Haldane, A (2009), 'Why banks failed the stress test', available at www.bankofengland.co.uk/publications/Documents/speeches/2009/speech374.pdf.

Haldane, A and Madouros, V (2012), 'The dog and the frisbee', available at www.bankofengland.co.uk/publications/Documents/speeches/2012/speech596.pdf.

Hanson, S and Stein, J (2012), 'Monetary policy and long-term real rates', *Finance and Economics Discussion Series*, Federal Reserve Board.

HM Treasury (2012), *The Financial Services Bill: the Financial Policy Committee's macro-prudential tools*, September.

Hoggarth, G, Mahadeva, L and Martin, J (2010), 'Understanding international bank capital flows during the recent financial crisis', *Bank of England Financial Stability Paper No. 8*.

Ichinose, A (1999), 'The bubble and monetary policy in Japan: 1984–89', *Okayama Economic Review*, Vol. 31, No. 3, pages 1–33.

International Monetary Fund (2008), *Iceland: Financial Stability Assessment — update*, December.

International Monetary Fund (2009a), *World Economic Outlook: Crisis and Recovery*, April.

International Monetary Fund (2009b), *Global Financial Stability Report*, April.

International Monetary Fund (2012), *Global Financial Stability Report*, April.

International Monetary Fund and Financial Stability Board (2009), *The financial crisis and information gaps: report to the G20 Finance Ministers and Central Bank Governors*, October.

Jiménez, G, Ongena, S, Peydró, J and Saurina, J (2012), 'Macroprudential policy, countercyclical bank capital buffers and credit supply: evidence from the Spanish dynamic provisioning experiments', *Barcelona GSE Working Paper No. 628*.

Kindleberger, C (1989), *Manias, panics and crashes: a history of financial crises*, New York, Basic Books.

King, M (2011), 'Global imbalances: the perspective of the Bank of England', *Financial Stability Review No. 15*, Banque de France, February, pages 1–8.

King, M (2012), 'The 2012 BBC Today Programme Lecture', available at www.bankofengland.co.uk/publications/Documents/speeches/2012/speech567.pdf.

Koo, R (2008), *The holy grail of macroeconomics: lessons from Japan's great recession*, Wiley.

Logan, A (2000), 'The early 1990s small banks' crisis: leading indicators', *Bank of England Financial Stability Review*, December, pages 130–45.

Lucas, R (1976), 'Econometric policy evaluation: a critique', in Brunner, K and Meltzer, A (eds), *The Phillips curve and labour markets*, Carnegie-Rochester Conference Series on Public Policy, No. 1, New York: American Elsevier, pages 19–46.

Macroeconomic Assessment Group (2010), *Assessing the macroeconomic impact of the transition to stronger capital and liquidity requirements: Interim Report*, Bank for International Settlements, August.

Mian, A and Sufi, A (2009), 'The consequences of mortgage credit expansion: evidence from the US mortgage default crisis', *Quarterly Journal of Economics*, Vol. 124, No. 4, pages 1,449–96.

Mian, A and Sufi, A (2011), 'House prices, home equity-based borrowing and the US household leverage crisis', *American Economic Review*, Vol. 101, No. 5, pages 2,132–56.

Minsky, H (1986), *Stabilizing an unstable economy*, Yale University Press.

Reid, M (1982), *The secondary banking crisis, 1973–1975*, Macmillan Press.

Reinhart, C and Reinhart, V (2008), 'Capital flow bonanzas: an encompassing view of the past and present', *NBER Working Paper No. 14321*.

Reinhart, C and Rogoff, K (2009), *This time is different: eight centuries of financial folly*, Princeton University Press.

Rule, D (2001), 'The credit derivatives market: its development and possible implications for financial stability', *Bank of England Financial Stability Review*, June, pages 117–40.

Schularick, M and Taylor, A M (2012), 'Credit booms gone bust: monetary policy, leverage cycles, and financial crises, 1870–2008', *American Economic Review*, Vol. 102, No. 2, pages 1,029–61.

Senior, S and Westwood, R (2000), 'The external balance sheet of the United Kingdom: implications for financial stability?', *Bank of England Quarterly Bulletin*, November, pages 351–64.

Tucker, P (2009), 'The debate on financial system resilience: macroprudential instruments', available at www.bankofengland.co.uk/publications/Documents/speeches/2009/speech407.pdf.

Tucker, P (2011), 'Macroprudential policy: building financial stability institutions', available at www.bankofengland.co.uk/publications/Documents/speeches/2011/speech492.pdf.

Tucker, P (2012a), 'National balance sheets and macro policy: lessons from the past', available at www.bankofengland.co.uk/publications/Documents/speeches/2012/speech547.pdf.

Tucker, P (2012b), 'Competition, the pressure for returns, and stability', available at www.bankofengland.co.uk/publications/Documents/speeches/2012/speech611.pdf.

Turner, A (2011), 'Debt and deleveraging: long-term and short-term challenges', available at www.fsa.gov.uk/library/communication/speeches/2011/1121_at.shtml.

Glossary

BBA – British Bankers’ Association.	LTV – loan to value.
BIS – Bank for International Settlements.	MAG – Macroeconomic Assessment Group.
CCB – countercyclical capital buffer.	MFI – monetary financial institution.
CCP – central counterparty.	MPC – Monetary Policy Committee.
CDS – credit default swap.	NBFI – non-bank financial institution.
CGFS – Committee on the Global Financial System.	OECD – Organisation for Economic Co-operation and Development.
CML – Council of Mortgage Lenders.	OIS – overnight index swap.
COREP – common European capital reporting.	ONS – Office for National Statistics.
CRD4/CRR – Capital Requirements Directive and Regulation.	OTC – over the counter.
CRE – commercial real estate.	PNFC – private non-financial corporation.
EBA – European Banking Authority.	PRA – Prudential Regulation Authority.
ECB – European Central Bank.	RBS – Royal Bank of Scotland.
EEA – European Economic Area.	RoA – return on assets.
ESRB – European Systemic Risk Board.	RPI – retail prices index.
EU – European Union.	S&P – Standard & Poor’s.
FCA – Financial Conduct Authority.	SCAP – Supervisory Capital Assessment Program.
FISIM – Financial Intermediation Services Indirectly Measured.	SCR – sectoral capital requirement.
FPC – Financial Policy Committee.	SME – small and medium-sized enterprise.
FSA – Financial Services Authority.	
FSR – <i>Financial Stability Report</i> .	
G20 – The Group of Twenty Finance Ministers and Central Bank Governors.	
GDP – gross domestic product.	
GMAC – General Motors Acceptance Corporation.	
HBOS – Halifax Bank of Scotland.	
HMT – Her Majesty’s Treasury.	
HSBC – Hong Kong and Shanghai Banking Corporation.	
IFRS – International Financial Reporting Standard.	
IMF – International Monetary Fund.	
IPD – Investment Property Databank.	
LBG – Lloyds Banking Group.	
Libor – London interbank offered rate.	
LTI – loan to income.	