

Financial Stability Report

June 2017 | Issue No. 41



BANK OF ENGLAND





BANK OF ENGLAND

Financial Stability Report

Presented to Parliament pursuant to Section 9W(10) of the Bank of England Act 1998 as amended by the Financial Services Act 2012.

June 2017



BANK OF ENGLAND

Financial Stability Report

June 2017 | Issue No. 41

The primary responsibility of the Financial Policy Committee (FPC), a committee of the Bank of England, is to contribute to the Bank of England's objective for maintaining financial stability. It does this primarily by identifying, monitoring and taking action to remove or reduce systemic risks, with a view to protecting and enhancing the resilience of the UK financial system. Subject to that, it supports the economic policy of Her Majesty's Government, including its objectives for growth and employment.

This *Financial Stability Report* sets out the FPC's view of the outlook for UK financial stability, including its assessment of the resilience of the UK financial system and the current main risks to financial stability, and the action it is taking to remove or reduce those risks. It also reports on the activities of the Committee over the reporting period and on the extent to which the Committee's previous policy actions have succeeded in meeting the Committee's objectives. The *Report* meets the requirement set out in legislation for the Committee to prepare and publish a *Financial Stability Report* twice per calendar year.

In addition, the Committee has a number of duties, under the Bank of England Act 1998. In exercising certain powers under this Act, the Committee is required to set out an explanation of its reasons for deciding to use its powers in the way they are being exercised and why it considers that to be compatible with its duties.

The Financial Policy Committee:

Mark Carney, Governor

Jon Cunliffe, Deputy Governor responsible for financial stability

Ben Broadbent, Deputy Governor responsible for monetary policy

Sam Woods, Deputy Governor responsible for prudential regulation

Andrew Bailey, Chief Executive of the Financial Conduct Authority

Alex Brazier, Executive Director for Financial Stability Strategy and Risk

Anil Kashyap

Donald Kohn

Richard Sharp

Martin Taylor

Charles Roxburgh attends as the Treasury member in a non-voting capacity.

This document was delivered to the printers on 26 June 2017 and, unless otherwise stated, uses data available as at 16 June 2017. This page was revised on 11 April 2018.

The *Financial Stability Report* is available in PDF at www.bankofengland.co.uk.

Contents

Foreword

Executive summary i

Box 1 The FPC's 2017 Q2 UK countercyclical capital buffer rate decision	vi
Box 2 Possible financial stability implications of the United Kingdom's withdrawal from the European Union	vii

Part A: Main risks to financial stability

The FPC's approach to addressing risks from the UK mortgage market	1
Box 3 PRA Supervisory Statement on underwriting standards for buy-to-let mortgages	11
Box 4 Powers of Direction over LTV limits	12
Box 5 The affordability test Recommendation	13
UK consumer credit	14
Box 6 Overview of the UK consumer credit market	18
Global environment	20
Asset valuations	23

Part B: Resilience of the UK financial system

Banking sector resilience	27
Box 7 Building cyber resilience in the UK financial system	32
Market-based finance	34
Box 8 The UK High-Value Payment System	39
The FPC's medium-term priorities	41
<hr/>	
Annex 1: Previous macroprudential policy decisions	42
Annex 2: Core indicators	45
Index of charts and tables	49
Glossary and other information	51

Executive summary

The Financial Policy Committee (FPC) aims to ensure the UK financial system is resilient to the wide range of risks it faces.

The FPC assesses the overall risks from the domestic environment to be at a standard level: most financial stability indicators are neither particularly elevated nor subdued.

As is often the case in a standard environment, there are pockets of risk that warrant vigilance. Consumer credit has increased rapidly. Lending conditions in the mortgage market are becoming easier. Lenders may be placing undue weight on the recent performance of loans in benign conditions.

Exit negotiations between the United Kingdom and the European Union have begun. There are a range of possible outcomes for, and paths to, the United Kingdom's withdrawal from the EU.

Some possible global risks have not crystallised, though financial vulnerabilities in China remain pronounced. Measures of market volatility and the valuation of some assets — such as corporate bonds and UK commercial real estate — do not appear to reflect fully the downside risks that are implied by very low long-term interest rates.

To ensure that the financial system has the resilience it needs, the FPC is:

- **Increasing the UK countercyclical capital buffer rate to 0.5%, from 0%.** Absent a material change in the outlook, and consistent with its stated policy for a standard risk environment and of moving gradually, the FPC expects to increase the rate to 1% at its November meeting.
- **Bringing forward the assessment of stressed losses on consumer credit lending** in the Bank's 2017 annual stress test. This will inform the FPC's assessment at its next meeting of any additional resilience required in aggregate against this lending. The FPC further supports the intentions of the Prudential Regulation Authority and Financial Conduct Authority to publish, in July, their expectations of lenders in the consumer credit market.
- **Clarifying its existing insurance measures in the mortgage market**, designed to prevent excessive growth in the number of highly indebted households. This will promote consistency across lenders in their application of tests to assess whether new mortgage borrowers can afford repayments.
- Consistent with its previous commitment, **restoring the level of resilience delivered by its leverage ratio standard** to the level it delivered in July 2016 before the FPC excluded central bank reserves from the leverage ratio exposure measure. The FPC intends to set the minimum leverage requirement at 3.25% of non-reserve exposures, subject to consultation.
- **Overseeing contingency planning to mitigate risks to financial stability as the United Kingdom withdraws from the European Union.**
- Building on the programme of cyber resilience testing it instigated in 2013, by **setting out the essential elements of the regulatory framework for maintaining cyber resilience.** It will now monitor that each element is being fulfilled by the relevant UK authorities.

The Financial Policy Committee (FPC) assesses the overall risks from the domestic environment to be at a standard level: most financial stability indicators are neither particularly elevated nor subdued.

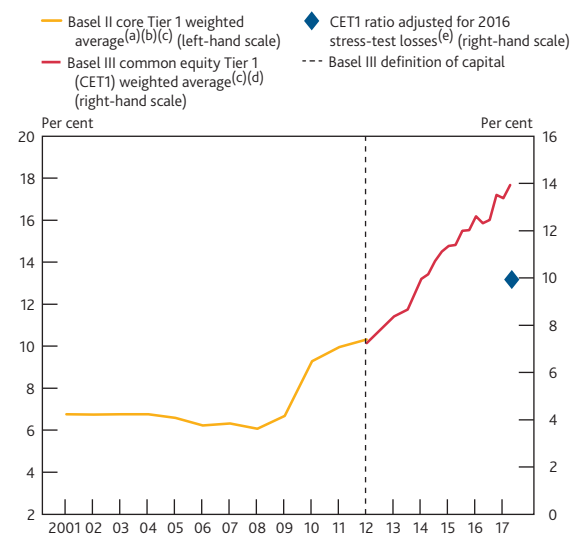
As is often the case in a standard environment, there are pockets of risk that warrant vigilance. Consumer credit has increased rapidly. Lending conditions in the mortgage market are becoming easier. Lenders may be placing undue weight on the recent performance of loans in benign conditions.

The FPC is increasing the UK countercyclical capital buffer (CCyB) rate to 0.5%, from 0% (see Box 1). Absent a material change in the outlook, and consistent with its stated policy for a standard risk environment and of moving gradually, the FPC expects to increase the rate to 1% at its November meeting.

- The action will supplement banks' already substantial ability to absorb losses (Chart A).

Chart A Major UK banks have continued to strengthen their capital positions

Major UK banks' capital ratios



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

- (a) Major UK banks' core Tier 1 capital as a percentage of their risk-weighted assets. Major UK banks are Banco Santander, Bank of Ireland, Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, National Australia Bank, Nationwide, RBS and Virgin Money. Data exclude Northern Rock/Virgin Money from 2008.
- (b) Between 2008 and 2011, 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 Report.
- (c) Weighted by risk-weighted assets.
- (d) From 2012, the 'Basel III common equity Tier 1 capital ratio' is calculated as common equity Tier 1 capital over risk-weighted assets, according to the CRD IV definition as implemented in the United Kingdom. The Basel III peer group includes Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK.
- (e) CET1 ratio less the aggregate percentage point fall projected under the Bank of England's 2016 annual cyclical stress scenario for the six largest UK banks.

- At its November meeting, the FPC will have the full set of results from the 2017 stress test of major UK banks.

- In line with its published policy, the FPC stands ready to cut the UK CCyB rate, as it did in July 2016, if a risk materialises that could lead to a material tightening of lending conditions. Banks' capital buffers exist to be used as necessary to allow banks to support the real economy in a downturn.

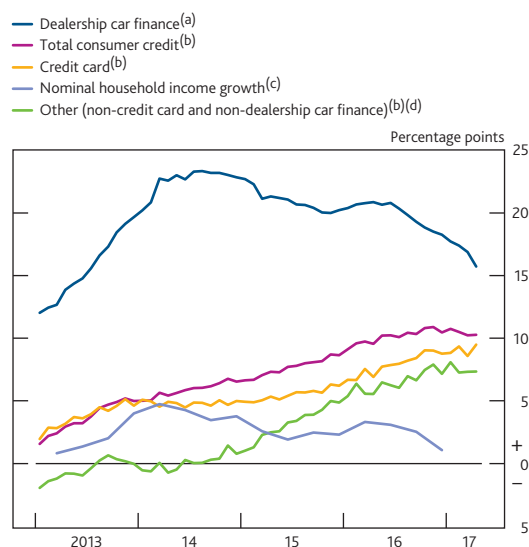
The FPC supports the intentions of the Prudential Regulation Authority (PRA) and Financial Conduct Authority (FCA) to publish, in July, their expectations of lenders in the consumer credit market. Firms remain the first line of defence. Effective governance at firms should ensure that risks are priced and managed appropriately and benign conditions do not lead to complacency by lenders.

The Bank's annual stress test assesses banks' resilience to risks in consumer credit. Given the rapid growth in consumer credit over the past twelve months, the FPC is bringing forward the assessment of stressed losses on consumer credit lending in the Bank's 2017 annual stress test. This will inform the FPC's assessment at its next meeting of any additional resilience required in aggregate against this lending.

- Consumer credit grew by 10.3% in the twelve months to April 2017 (Chart B) — markedly faster than nominal household income growth. Credit card debt, personal loans and motor finance all grew rapidly.

Chart B Consumer credit has been growing much faster than household incomes

Annual growth rates of consumer credit products and household income



Sources: Bank of England, ONS and Bank calculations.

- (a) Identified dealership car finance lending by UK monetary financial institutions (MFIs) and other lenders.
- (b) Sterling net lending by UK MFIs and other lenders to UK individuals (excluding student loans). Non seasonally adjusted.
- (c) Percentage change on a year earlier of quarterly nominal disposable household income. Seasonally adjusted.
- (d) Other is estimated as total consumer credit lending minus dealership car finance and credit card lending.

- Loss rates on consumer credit lending are low at present. Partly as a result, banks' net interest margins on new lending have fallen and major lenders are using lower risk weights to calculate the capital they need to hold. The current environment is also likely to have improved the credit scores of borrowers.
- Other things equal, these developments mean lenders have less capacity to absorb losses, either with income or capital buffers. In this context, a review by the PRA has found evidence of weaknesses in some aspects of underwriting and a reduction in resilience.
- The short maturity of consumer credit means that the credit quality of the stock of lending can deteriorate quickly. Lenders expect to continue to grow their portfolios this year, at the same time as real household income growth is expected to remain particularly weak.

The FPC has clarified its existing insurance measures in the mortgage market, designed to prevent excessive growth in the number of highly indebted households. Lenders should test affordability at their mortgage reversion rate — typically their standard variable rate — plus 3 percentage points. This will promote consistency across lenders in their application of tests to assess whether new mortgage borrowers can afford repayments.

- Historically, the build-up of mortgage debt has been a significant risk to financial and economic stability. Because highly indebted borrowers need to cut spending sharply in a downturn, recessions become deeper. And looser underwriting standards expose banks to bigger losses.
- The FPC put policies in place to guard against these risks in 2014. These Recommendations were: a limit on lending at loan to income multiples at 4.5 or above; and guidance to lenders to assess whether new borrowers would be able to afford their repayments if interest rates were to rise.
- Following a review (see The FPC's approach to addressing risks from the UK mortgage market chapter), the FPC expects its measures to remain in place for the foreseeable future.
- Mortgage lending at high loan to income ratios is increasing and the spreads and fees on mortgage lending have fallen. If lenders were to weaken underwriting standards to maintain mortgage growth, the FPC's measures would limit growth in the number of highly indebted households. This would have material benefits for economic and financial stability by mitigating the further cutbacks in spending that highly indebted households make in downturns.

Consistent with its previous commitment, the FPC is restoring the level of resilience delivered by its leverage ratio standard to the level it delivered in July 2016, before the FPC excluded central bank reserves from the leverage ratio exposure measure. The FPC therefore intends to set the minimum leverage requirement at 3.25% of non-reserve exposures, subject to consultation.

- In July 2016, the FPC excluded central bank reserves from the measure of banks' exposures used to assess their leverage. This change reflected the special nature of central bank reserves and was designed to avoid a situation in which the Committee's leverage standards impeded the transmission of monetary policy.
- The FPC committed last year that it would make an offsetting adjustment to ensure that the amount of capital needed to meet the UK leverage ratio standard would not decline. The FPC did not intend for there to be a permanent loosening of the standard.
- By raising the minimum leverage standard from 3% to 3.25%, the FPC intends to ensure that the original standard of resilience is restored, while also preserving the benefits of excluding central bank reserves from the exposure measure.

Exit negotiations between the United Kingdom and the European Union have begun. There are a range of possible outcomes for, and paths to, the United Kingdom's withdrawal from the EU. The FPC will oversee contingency planning to mitigate risks to financial stability as the withdrawal process evolves (see Box 2).

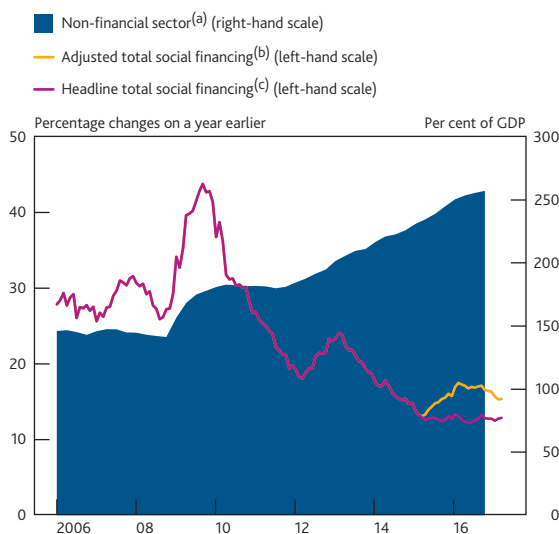
Irrespective of the particular form of the United Kingdom's future relationship with the European Union, and consistent with its statutory responsibility, the FPC will remain committed to the implementation of robust prudential standards in the UK financial system. This will require a level of resilience to be maintained that is at least as great as that currently planned, which itself exceeds that required by international baseline standards.

- The United Kingdom's position as the leading internationally active financial centre, with a financial centre that is, by asset size, around ten times GDP, means that the FPC's statutory responsibility of protecting and enhancing the resilience of the UK financial system is particularly important for both the domestic and global economies.
- Absent consistent implementation of standards internationally and appropriate supervisory co-operation, the FPC would need to assess how best to protect the resilience of the UK financial system.

Some possible global risks have not crystallised, though financial vulnerabilities in China remain pronounced. Measures of market volatility and the valuation of some assets — such as corporate bonds and UK commercial real estate — do not appear to reflect fully the downside risks that are implied by very low long-term interest rates. Banks' ability to withstand these risks is being tested in the 2017 stress test scenario.

- Euro-area sovereign bond spreads have fallen as some political uncertainties have been resolved. Further progress has been made in strengthening European bank capital positions, and a domestically significant bank in Spain was resolved in an orderly fashion.
- In China, capital outflows have stabilised, but economic growth continues to be accompanied by rapid credit expansion (Chart C).

Chart C Credit continues to grow rapidly in China
China non-financial sector debt and growth of total social financing



Sources: BIS total credit statistics, CEIC and Bank calculations.

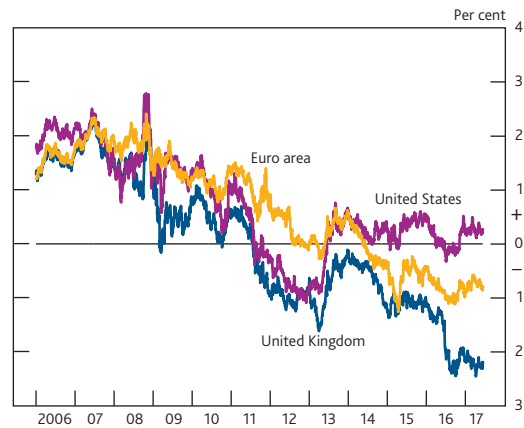
- (a) Non-financial sector debt data are to 2016 Q4. Includes lending by all sectors at market value as a percentage of GDP, adjusted for breaks.
 (b) Total social financing adjusted for net issuance of local government bonds.
 (c) The People's Bank of China stock of total social financing used from December 2014 onwards. Prior to this the stock of total social financing is estimated using monthly 'newly increased' total social financing flows.

- Measures of uncertainty implied by options prices are low (see Asset valuations chapter). Often in periods of low volatility, risks are building and later become apparent.
- In the United Kingdom, ten-year real government bond yields are at around -2% (Chart D). Long-term real rates are low across the G7. These levels are consistent with pessimistic growth expectations and high perceived tail risks.

- Some asset valuations, particularly for some corporate bonds and UK commercial real estate assets, appear to factor in a low level of long-term market interest rates but do not appear to be consistent with the pessimistic and uncertain outlook embodied in those rates (Chart E).

Chart D Advanced-economy risk-free real interest rates remain close to historically low levels

International ten-year real government bond yields^(a)

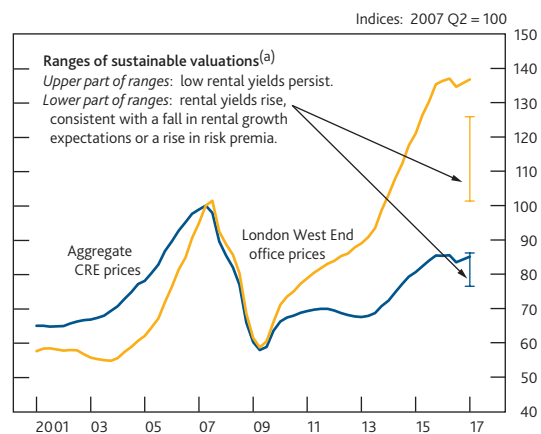


Sources: Bloomberg and Bank calculations.

- (a) Zero-coupon bond yields derived using inflation swap rates. UK real rates are defined relative to RPI inflation, whereas US and euro-area real rates are defined relative to CPI and HICP inflation respectively.

Chart E UK commercial real estate prices look stretched based on ranges of sustainable valuations

Commercial real estate prices in the United Kingdom and ranges of sustainable valuations



Sources: Bloomberg, Investment Property Forum, MSCI Inc. and Bank calculations.

- (a) Sustainable valuations are estimated using an investment valuation approach and are based on an assumption that property is held for five years. The sustainable value of a property is the sum of discounted rental and sale proceeds. The rental proceeds are discounted using a 5-year gilt yield plus a risk premium, and the sale proceeds are discounted using a 20-year, 5-year forward gilt yield plus a risk premium. Expected rental value at the time of sale is based on Investment Property Forum Consensus forecasts. The range of sustainable valuations represents varying assumptions about the rental yield at the time of sale: either rental yields remain at their current levels (at the upper end), or rental yields revert to their 15-year historical average (at the lower end). For more details, see Crosby, N and Hughes, C (2011), 'The basis of valuations for secured commercial property lending in the UK', *Journal of European Real Estate Research*, Vol. 4, No. 3, pages 225–42.

- These asset prices are therefore vulnerable to a repricing, whether through an increase in long-term interest rates or an adjustment of growth expectations, or both. The impact of this could be amplified given reduced liquidity in some markets.

Progress has been made in building resilience to cyber attack, but the risk continues to build and evolve. Regulators are nearing completion of a first round of cyber resilience testing for all firms at the core of the UK financial system, in line with the Recommendation from the FPC in 2015.

- The FPC's concern is to mitigate systemic risk — the risk of material disruption to the economy.
- With 31 out of 34 firms at the core of the UK financial system, including banks representing more than 80% of the outstanding stock of PRA-regulated banks' lending to the UK real economy, so far having completed penetration testing and having action plans in place, the FPC is satisfied that its 2015 Recommendation has been met.
- Consistent with that, the FPC is also setting out the essential elements of the regulatory framework for maintaining cyber resilience and will now monitor that each element is being fulfilled by the relevant UK authorities.
- Alongside the Bank, PRA and FCA, the FPC will now consider its tolerance for the disruption to important economic functions of the financial system in the event of cyber attack.

The FPC has updated its medium-term priorities (see The FPC's medium-term priorities chapter).

- The FPC's primary responsibility is to identify, monitor and take action to remove or reduce systemic risks, with a view to protecting and enhancing the resilience of the UK financial system. It aims to ensure the financial system does not cause problems for the rest of the economy and, if and when problems arise in the economy, the financial system can absorb rather than amplify them.
- To help to meet its objectives, alongside its ongoing assessment of the risk environment, the FPC is prioritising three initiatives over the next two to three years:
 - Finalising, and refining if necessary, post-crisis bank capital and liquidity reforms.
 - Completing post-crisis reforms to market-based finance in the United Kingdom, and improving the assessment of systemic risks across the financial system.
 - Preparing for the United Kingdom's withdrawal from the European Union.

Part A of this *Report* sets out in detail the Committee's analysis of the major risks and action it is taking in the light of those risks. Part B summarises the Committee's analysis of the resilience of the financial system.

Box 1 The FPC's 2017 Q2 UK countercyclical capital buffer rate decision

The FPC is increasing the UK countercyclical capital buffer (CCyB) rate from 0% to 0.5%, with binding effect from 27 June 2018. Absent a material change in the outlook, and consistent with its stated policy for a standard risk environment and of moving gradually, the FPC expects to increase the rate to 1% at its November meeting, with binding effect a year after that. At that point, it will have the full set of results from the 2017 stress test of major UK banks.

The increase to 0.5% will raise regulatory buffers of common equity Tier 1 capital by £5.7 billion. This will provide a buffer of capital that can be released quickly in the event of an adverse shock occurring that threatens to tighten lending conditions. The increase in the CCyB rate will also lead to a proportional increase in major UK banks' leverage requirements via the countercyclical leverage buffer (CCLB).

The Committee's decision to increase the UK CCyB rate to 0.5% — with an expectation of a further increase to 1% in November — reflects its assessment of the current risk environment and its intention to vary the buffer in gradual steps.

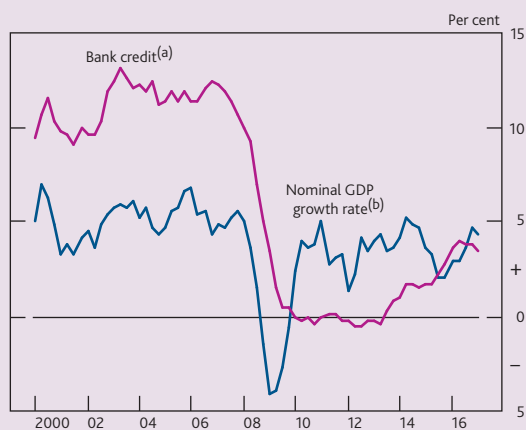
In its published strategy for setting the CCyB, the FPC signalled that it expects to set a UK CCyB rate in the region of 1% in a standard risk environment. The FPC assesses the overall risks from the domestic environment to be at a standard level: most financial stability indicators are neither particularly elevated nor subdued. Domestic credit has grown broadly in line with nominal GDP over the past two years (Chart A). Within the overall risk environment, some indicators are more benign. For example, despite high levels of indebtedness, private sector debt-servicing costs are low, supported by the low level of interest rates. In contrast, risk levels in some sectors are more elevated, notably so in the consumer credit market (see UK consumer credit chapter). Global risks — which could influence the risks on UK exposures indirectly via their potential effects on UK economic growth — are also judged to be material, as are risks from some asset valuations.

The FPC's measured approach is likely to decrease the risk that banks adjust by tightening credit conditions, thereby minimising the cost to the economy of making the banking system more resilient.

In line with its published policy, the FPC stands ready to cut the UK CCyB rate, as it did in July 2016, if a risk materialises that could lead to a material tightening of lending conditions.

Chart A Credit directly financed by the banking system has grown broadly in line with nominal GDP over the past two years

Growth in credit to households and firms compared with nominal GDP growth



Sources: ONS and Bank calculations.

- (a) Quarterly twelve-month growth rate of monetary financial institutions' sterling net lending to private non-financial corporations and households (in per cent) seasonally adjusted.
(b) Twelve-month growth rate of nominal GDP.

The cut in the CCyB rate in July 2016 was a response to greater uncertainty around the UK economic outlook and an increased possibility that material domestic risks could crystallise in the near term. The FPC's action served to ensure banks did not hoard capital and restrict lending in those conditions. Banks' capital buffers exist to be used as necessary to allow banks to support the real economy in a downturn.

Under EU law, the UK CCyB rate applies automatically (up to a 2.5% limit, and currently subject to a transition timetable) to the UK exposures of firms incorporated in other European Economic Area (EEA) states. The FPC expects it to apply also to internationally active banks in jurisdictions outside the EEA that have implemented the Basel III regulatory standards. Consistent with this, recent CCyB actions by Czech Republic, Hong Kong and Norway have been reciprocated.

Box 2

Possible financial stability implications of the United Kingdom's withdrawal from the European Union

In March 2017, the UK Government notified the European Council of the United Kingdom's intention to withdraw from the European Union. This initiated, under Article 50 of the Treaty on European Union, a two-year period for the United Kingdom and the European Union to negotiate and conclude a withdrawal agreement. The exit negotiations have now begun.

As the FPC stated in September 2016, irrespective of the particular form of the United Kingdom's future relationship with the European Union, and consistent with its statutory responsibility, the FPC will remain committed to the implementation of robust prudential standards in the UK financial system. This will require a level of resilience to be maintained that is at least as great as that currently planned and which itself exceeds that required by international baseline standards.⁽¹⁾

In addition, consistent with its statutory duty, **the FPC will continue to identify and monitor UK financial stability risks, so that preparations can be made and action taken to mitigate them.**

There are a range of possible outcomes for the United Kingdom's future relationship with the European Union and possible paths to that relationship. Consistent with its remit, the FPC is focused on scenarios that, even if they may be the least likely to occur, could have most impact on UK financial stability. This includes a scenario in which there is no agreement in place at the point of exit. Such scenarios are where contingency planning and preparation will be most valuable.

The Bank, FCA and PRA are working closely with regulated firms and financial market infrastructures (FMIs) to ensure they have comprehensive contingency plans in place. The FPC will oversee contingency planning to mitigate risks to financial stability as the withdrawal process unfolds.

Through this work, the FPC is aiming to promote an orderly adjustment to the new relationship between the United Kingdom and the European Union.

Without contingency plans that can be executed in the available time, effects on financial stability could arise both through direct effects on the provision of financial services, and indirectly, through macroeconomic shocks that could test the resilience of the financial system.

(1) Direct effects on the provision of financial services

A very large part of the United Kingdom's legal and regulatory framework for financial services is directly or indirectly derived from EU law. **The United Kingdom's financial services law must therefore become domestic at the point of withdrawal.** The Government plans to execute this through the Repeal Bill. Once enacted, this will ensure there is no legal or regulatory vacuum in respect of financial services when the United Kingdom leaves the European Union.

The European Union's framework for financial services establishes the right of financial companies within the European Economic Area (EEA) to provide services across national borders and to establish local branches in other Member States without local authorisation.

This promotes substantial cross-border provision of a wide range of financial services. Around £40 billion of UK financial services revenues relate to EU clients and markets.⁽²⁾ These cross-border connections have resulted in more efficient financial services for businesses and households across the European Union.

There is no generally applicable institutional framework for cross-border provision of financial services outside the European Union. Globally, liberalisation of trade in services lags far behind liberalisation of trade in goods. So without a new bespoke agreement, UK firms could no longer provide services to EEA clients (and *vice versa*) in the same manner as they do today, or in some cases not at all. This creates two broad risks. First, services could be dislocated as clients and providers adjust. Second, the fragmentation of service provision could increase costs and risks.

In the United Kingdom, the **flow of new banking and insurance services to UK customers could be disrupted** if EEA firms are unable to operate in the United Kingdom in the same manner as they do today. Around 10% of the outstanding stock of loans to private non-financial corporations in the United Kingdom is extended by UK branches of EEA banks.⁽³⁾

Around 7% of **general insurance contracts undertaken in the United Kingdom** and 3% of life insurance contracts are written by EEA insurers.⁽⁴⁾ As well as disrupting new business from these providers, fragmentation could require the existing contracts to be transferred to a UK-authorised firm in order to address any legal uncertainties as to the status of, and ability to perform, such contracts.

(1) www.bankofengland.co.uk/publications/Pages/news/2016/033.aspx.

(2) Source: Oliver Wyman, 2016.

(3) Source: Bank of England calculations.

(4) Sources: Firms' published accounts, regulatory data and Bank calculations. Based on premiums relating to insurance contracts.

There could also be material dislocation of some services supplied from the United Kingdom to the European Union. EU clients would need to source substitute services from banks and FMI established in the EEA or other countries recognised by the European Commission as 'equivalent'. This is particularly relevant to new debt and equity issuance and derivatives business. These dislocations could also disrupt the provision of services to UK clients who rely on EU counterparties.

UK-located banks underwrite around half of the debt and equity issued by EU companies.⁽¹⁾ EU companies could need to find alternative providers of this service to sustain their capital market issuance.

UK-located banks are counterparty to over half of the over-the-counter (OTC) interest rate derivatives traded by EU companies and banks.⁽²⁾ To support EU-based derivatives trading, substantial operational capacity may need to be established in the European Union and additional capital and balance sheet capacity would probably be needed.

Central counterparties (CCPs) located in the United Kingdom provide services to EU clients in a range of markets. The United Kingdom houses some of the world's largest CCPs. For example, LCH handles over 90% of cleared interest rate swaps globally.

In addition to the potential disruption to new clearing business for EU firms, if EU firms are unable to move their existing derivatives contracts to EU authorised or recognised CCPs, they would face capital charges that are up to ten times higher. Moreover, to move a large stock of existing trades will pose substantial and complex operational and legal challenges.

In addition to the dislocation of services, **fragmentation of market-based finance could result in higher costs and greater risks for both EU and UK companies and households.**

Separation of derivatives clearing would reduce the benefits of central clearing. It would impair the ability to diversify risks across borders and, by increasing costs, reduce incentives for firms to hedge risks. Industry estimates suggest that a single basis point increase in cost resulting from splitting clearing of interest rate swaps could cost EU firms €22 billion per year across all of their business.

Delegation of asset management across borders is a well-established practice. For example, 40% of the assets managed in the United Kingdom are managed for overseas clients; around half of this activity is on behalf of clients outside Europe.⁽³⁾ UK-located asset managers account for 37% of all assets managed in Europe.⁽⁴⁾ If asset management

were to fragment between the United Kingdom and Europe, material economies of scale and scope that are currently achieved by pooling of funds and their management would be reduced.

Together, these effects could **increase the reliance of both the UK and EU economies on their banking systems and reduce the diversification and resilience of finance.**

(2) Macroeconomic shocks that could test the resilience of the financial system

To maintain consistent provision of financial services to the UK economy, the financial system must be able to absorb the impacts on their balance sheets of any adverse economic shocks that could arise in some scenarios for the United Kingdom's withdrawal from the European Union.

The Bank of England's regular stress testing aims to ensure that the banking system has the strength to withstand, and continue to lend in, a broad and severe economic and market shock.

The United Kingdom's withdrawal from the European Union has the potential to affect the economy through supply, demand and exchange rate channels.⁽⁵⁾

The supply side of the economy could be disrupted by abrupt increases in the costs of, or obstacles to, cross-border trade. **Demand** could be impacted by the abrupt introduction of restrictions on exports of financial and other services and tariffs on trade in goods with the European Union. A reduction in economic activity in high tax-paying sectors could affect public finances and spending.

In some scenarios, heightened uncertainty could also reinforce the existing risk of a fall in appetite of foreign investors for UK assets. The United Kingdom relies on inflows of overseas capital to finance its current account deficit — the excess of investment over domestic saving. That deficit, which stood at 4.4% of GDP in 2016, is financed largely through direct investment and portfolio investment in the form of long-term debt and equity (**Chart A**).

A material reduction in the appetite of foreign investors to provide finance to the United Kingdom would tighten financing conditions for UK borrowers and reduce asset prices

(1) Based on Bank analysis of UK-located investment banks' revenues in 2015 for M&A and debt/equity issuance activities, using multiple sources.

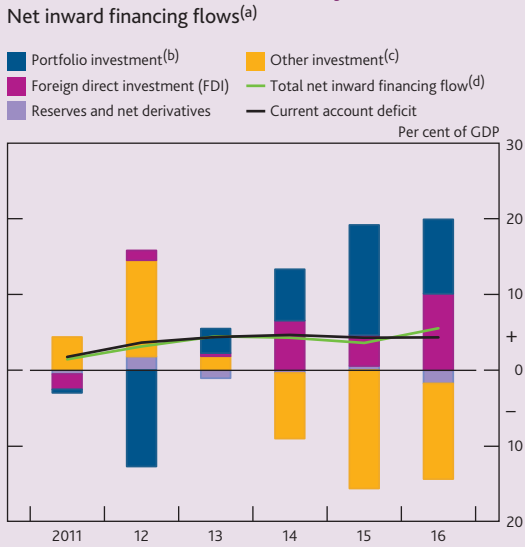
(2) Based on Bank calculations and multiple sources, including Bank for International Settlements triennial survey data (2016) which show UK-based dealers account for 82% of European trading in OTC single currency interest rate derivatives.

(3) Sources: Investment Association Annual Survey (2015–2016) and Bank calculations.

(4) Source: Investment Association Annual Survey (2015–2016).

(5) See the May 2017 *Inflation Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2017/may.pdf.

Chart A The United Kingdom has relied on material inflows of portfolio investment and FDI to finance its current account deficit in recent years



Sources: ONS and Bank calculations.

- (a) This is the change in UK foreign liabilities, less the change in UK foreign assets, for each category of investment. These data are presented as annual series using four-quarter averages.
- (b) Portfolio investment consists of debt securities (including government debt), equities and investment fund shares.
- (c) Other investment consists mostly of loans and deposits.
- (d) The total net inward financing flow is equal in magnitude to the current account deficit (plus errors and omissions).

and investment. The effect could be most pronounced in markets that have recently had greater reliance on access to overseas capital, such as commercial real estate (CRE). Around half of the investment in UK CRE since 2015 has been financed by overseas investors (**Chart B**).

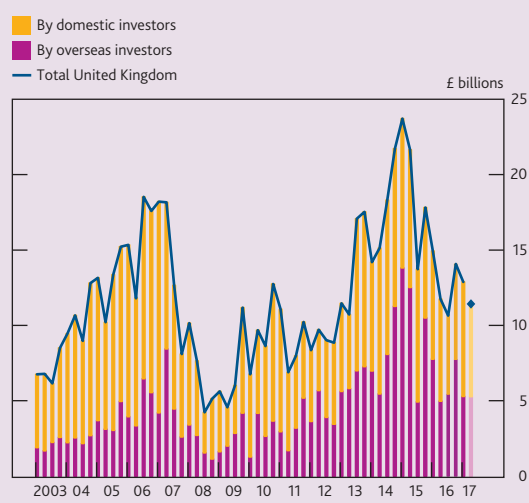
All else equal, economic shocks like these would probably depress the **exchange rate, putting upward pressure on inflation**. The combination of shocks could therefore possibly create a more challenging trade-off for monetary policy. The Monetary Policy Committee would have to make careful judgements about the net effect of these influences on demand, supply and inflation.

In these circumstances, the maintenance of financial stability would require banks to be able to withstand, and continue lending in, an environment of higher loan impairments, increased risk of default on other assets, and lower asset prices and collateral values.

Mitigating risks to financial stability

The FPC will continue to assess the resilience of the UK financial system to adverse economic shocks that could arise. The FPC will use the information from its regular stress testing of major UK banks and building societies. These test banks' resilience to a range of relevant scenarios, including a snap back of interest rates, sharp adjustment in UK property markets, and severe stress in the euro area.

Chart B Overseas investors have accounted for around half of total investment in UK CRE since 2015



Sources: The Property Archive and Bank calculations.

(a) Final data points are the sum of three months to May 2017.

The FPC will continue to assess the suitability of firms' contingency plans for emerging risks, in the context of progress on agreements and the continuity of the domestic regulatory framework. This will draw on reviews by the Bank, PRA and FCA of firms' plans, including responses from banks, insurers and designated investment firms to the PRA's April 2017 letter requesting that they summarise their contingency plans for the full range of possible scenarios following the United Kingdom's withdrawal from the European Union.

The FPC's approach to addressing risks from the UK mortgage market

Summary

Buying a house is the biggest investment that many people will make in their lives, and it is typically financed by debt.

In the United Kingdom, mortgages are households' largest liability and lenders' largest loan exposure.

The FPC's concern is with risks to the resilience of both borrowers and lenders that arise from high levels of household debt. While a significant factor contributing to high levels of house prices relative to incomes in the United Kingdom has been the relatively limited growth in the stock of housing, the main drivers of housing supply are not under the control of the Bank of England or the FPC. Consumer protection, meanwhile, remains the responsibility of the FCA.

Historically, the build-up of mortgage debt has been a key source of risk to financial and economic stability:

- Highly indebted households are more vulnerable to unexpected falls in their incomes or increases in their mortgage repayments.
- In an economic downturn, they do all they can to pay their mortgages, but — as a result — may have to cut spending sharply, making the downturn worse.
- In doing so, they also increase the risk of losses to lenders, not just on mortgages, but on other lending too.

Build-ups of mortgage debt can be self-reinforcing. Lenders' underwriting standards can turn quickly from responsible to reckless:

- Housing is the main source of collateral in the real economy, so higher house prices tend to lead to higher levels of mortgage lending, feeding back into higher valuations.
- In an upturn, when risks are perceived to be low, lenders' underwriting standards can loosen quickly, as they seek to maintain or build market share. This increases the supply of credit further.

To insure against these risks, in June 2014 the FPC introduced a policy package, designed to prevent a significant increase in the number of highly indebted households and a marked loosening in underwriting standards. The two FPC Recommendations were to:

- limit the proportion of mortgages extended at high loan to income ratios; and
- promote minimum standards for how lenders test affordability for borrowers.

These measures were not expected to restrain housing market activity unless lenders' underwriting standards eased. They were put in place as insurance and complement the annual stress tests of major lenders, which test that lenders can withstand sharp economic downturns, including large falls in house prices, while also continuing to lend.

The FPC views its Recommendations as likely to remain in place for the foreseeable future. It judges that their benefits would increase if they became more binding relative to lenders' underwriting standards. The FPC will continue to review their calibration on a regular basis.

The FPC has clarified its affordability test Recommendation to ensure consistency in its application across lenders. The Committee has recommended that:

- When assessing affordability, mortgage lenders should apply an interest rate stress test that assesses whether borrowers could still afford their mortgages if, at any point over the first five years of the loan, their mortgage rate were to be 3 percentage points higher than the reversion rate specified in the mortgage contract at origination.

This Recommendation can alternatively be interpreted as introducing a 'safety margin' between current mortgage payments and current income, also ensuring that the household sector as a whole is better able to withstand adverse shocks to income and employment.

The housing market can be a key source of risk to financial stability

Housing accounts for nearly half of the total assets of UK households. And around two thirds of house purchases are financed by mortgage debt.

Housing has been at the heart of many financial crises. Since the 1950s, there has been a material rise in mortgage debt across advanced economies, driving a major expansion of the balance sheet of the financial sector. More than two thirds of the 46 systemic banking crises for which house price data are

available were preceded by housing boom-bust cycles.⁽¹⁾ Mortgage booms have also tended to be followed by periods of considerably slower economic growth than non-mortgage credit booms, irrespective of whether a financial crisis occurred or not.⁽²⁾

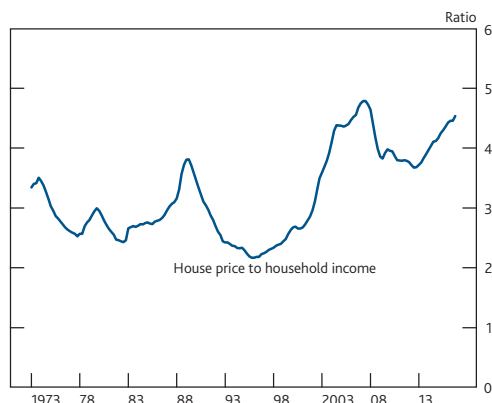
Mortgages are the largest liability of UK households. They can be a source of risk for borrowers' resilience and broader economic activity.

Over the past 20 years, house prices have risen significantly relative to incomes, so households have to borrow more to buy a house. The resulting high levels of household debt expose the UK economy to the risk of sharp cuts in consumption in the face of shocks to income or interest rates.

A significant factor contributing to high levels of house prices relative to incomes in the United Kingdom (**Chart A.1**)⁽³⁾ has been the relatively limited growth in the stock of housing. The absolute level of house prices may further reflect a protracted decline in interest rates.

Chart A.1 UK house prices have risen significantly relative to households' incomes

UK house price to household income ratio^{(a)(b)}



Sources: Department for Communities and Local Government, Halifax, Nationwide, ONS and Bank calculations.

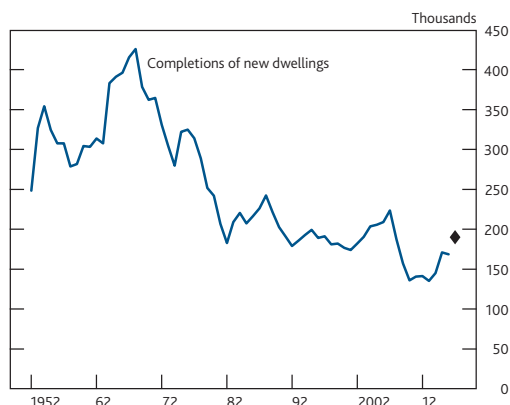
(a) The ratio is calculated as average UK house price divided by the four-quarter moving sum of gross disposable income of the UK household and non-profit sector per household. Aggregate household disposable income is adjusted for financial intermediation services indirectly measured (FISIM) and changes in pension entitlements.

(b) House price is an average of the Halifax and Nationwide indices.

Over the past 50 years, the number of new houses built each year in the United Kingdom has more than halved, from a peak of 426,000 in 1968 (**Chart A.2**). Since 1982, this number has averaged less than 190,000, while the UK population has increased by around 265,000 per year.⁽⁴⁾ Partly as a result, the cost of renting a property — as well as buying it — can be high relative to household incomes in parts of the country. In the 2016 NMG survey, around one third of respondents who lived in rented accommodation reported that their rental payments were 30% or more of their pre-tax incomes. The main drivers of housing supply are not under the control of the Bank of England or the FPC, and are partly related to the planning system.⁽⁵⁾

Chart A.2 Over the past 50 years, the number of houses built each year has more than halved

Completions of new dwellings in the United Kingdom^(a)



Sources: Department for Communities and Local Government and Bank calculations.

(a) Total number of permanent dwellings completed in the United Kingdom per calendar year. Includes completions from private enterprises, housing associations and local authorities. Data for 2016 Q4 and 2017 Q1 assume that completions of new dwellings in the United Kingdom as a whole have grown in line with those in England. The diamond shows the 2017 Q1 outturn on an annualised basis for 2017. Data are seasonally adjusted.

Long-term real interest rates have been declining across advanced economies for several decades. Global structural factors — such as demographics — are likely to have been the primary driver of these falls, which have contributed to a rise in the level of house prices.⁽⁶⁾ In recent months, annual house price inflation has weakened; in May 2017 house prices rose at the slowest annual rate since May 2013.⁽⁷⁾ But while respondents to the RICS survey in May 2017 expected the slowdown to continue in the near term, they expected prices to rise over the next year.

Building up a deposit to buy a house has become more difficult. The average house price for first-time buyers increased from around £50,000 in 1997 to over £200,000 in 2016. Over the same period, the size of a typical deposit for a first-time buyer increased from less than £5,000 to over £30,000. The Wealth and Assets Survey⁽⁸⁾ suggests that only

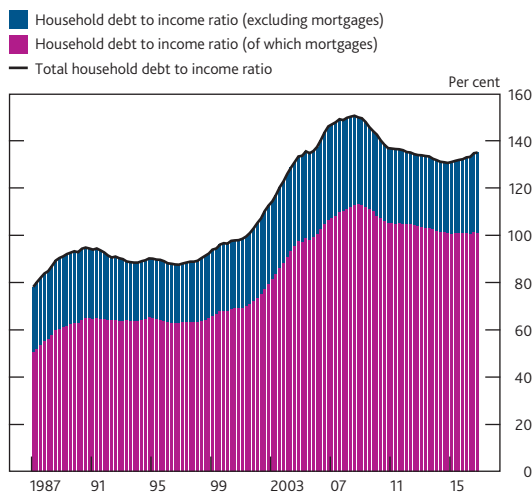
- (1) Crowe, C, Dell'Ariccia, G, Igan, D and Rabanal, P (2011), 'How to deal with real estate booms: lessons from country experiences', *IMF Working Paper 11/91*; www.imf.org/external/pubs/ft/wp/2011/wp1191.pdf.
- (2) See Jordà, O, Schularick, M and Taylor, A M (2014), 'The great mortgaging: housing finance, crises and business cycles', *Federal Reserve Bank of San Francisco Working Paper 2014-23*; www.frbsf.org/economic-research/publications/working-papers/wp2014-23.pdf.
- (3) The national average masks regional differences. At end-2015, the house price to household income ratio was 3.5 in the North of England and 6.2 in London, and averaged 4.2 for the United Kingdom.
- (4) Over 1981–2016, the size of the average UK household has also fallen, incrementing the pressure from population growth. For evidence on the impact of supply on affordability, see Hilber, C A L and Vermeulen, W (2015), 'The impact of supply constraints on house prices in England'; <http://onlinelibrary.wiley.com/doi/10.1111/econj.12213/abstract>.
- (5) For more details see Barker, K (2004), *Review of housing supply*; https://web.archive.org/web/20080513212848/http://www.hm-treasury.gov.uk/consultations_and_legislation/barker/consult_barker_index.cfm#report and Hilber, C A L and Vermeulen, W (2015), *op cit*.
- (6) See the box 'Explaining the long-term decline in interest rates' on pages 8–9 of the November 2016 *Inflation Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2016/nov.pdf and the box 'The long-term outlook for interest rates' on pages 6–7 of the May 2017 *Inflation Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2017/may.pdf.
- (7) Based on the average of the Halifax and Nationwide house price indices.
- (8) The Wealth and Assets Survey is a household survey that gathers information on, among other things, level of savings and debt, saving for retirement, how wealth is distributed across households and factors that affect financial planning.

around 6% of renters aged 45 or younger have financial assets worth £30,000 or more, and that only 11% have £15,000 or more.

The increase in house prices relative to incomes in recent decades has contributed to a rise in UK household indebtedness, which is currently high by historical standards. Since the late 1980s, the outstanding stock of mortgage debt has nearly doubled and represents the majority of the aggregate household debt to income (DTI) ratio (Chart A.3).

Chart A.3 UK household indebtedness is high by historical standards

UK household debt to income ratio^{(a)(b)(c)(d)}



Sources: ONS and Bank calculations.

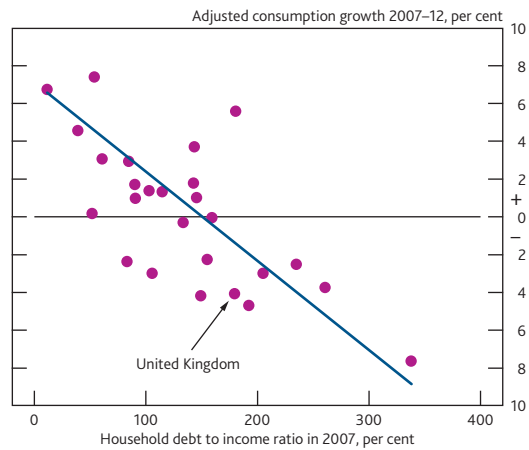
- (a) Total household debt to income ratio is calculated as gross debt as a percentage of a four-quarter moving sum of gross disposable income of the UK household and non-profit sector. Includes all liabilities of the household sector except for unfunded pension liabilities and financial derivatives of the non-profit sector.
- (b) Mortgage debt to income ratio is calculated as total debt secured on dwellings as a percentage of a four-quarter moving sum of disposable income.
- (c) Non-mortgage debt is the residual of mortgage debt subtracted from total debt.
- (d) The household disposable income series is adjusted for FISIM and changes in pension entitlements.

During the financial crisis, countries that had initially higher levels of household debt relative to income saw larger falls in aggregate consumption (Chart A.4), putting downward pressure on broader economic activity. Analysis of household-level data also suggests that individual households with higher mortgage debt relative to income adjust spending more sharply in response to shocks. For example, data from the Living Costs and Food Survey show that, during the financial crisis, the fall in consumption relative to income among UK households with loan to income (LTI) ratios above four was around three times larger than the fall for those with ratios between one and two (Chart A.5). Econometric studies confirm these results, even after controlling for other household characteristics.⁽¹⁾

Given the 'full-recourse' nature of UK mortgage contracts, borrowers in the United Kingdom typically do all they can to pay their mortgages rather than default, including cutting back sharply on spending. In the United Kingdom, if

Chart A.4 Countries with higher levels of household debt relative to income saw larger consumption falls in the crisis

Household debt to income ratio and consumption growth over 2007–12^(a)

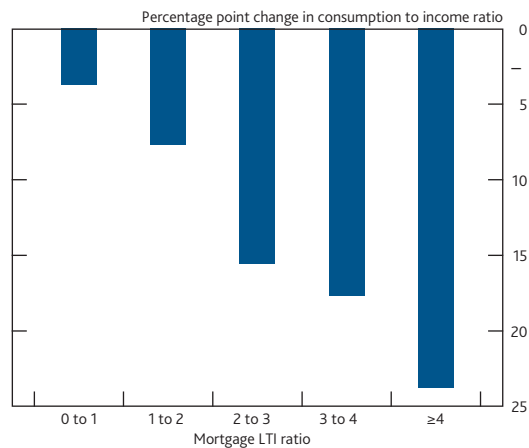


Sources: Flodén (2014) and OECD National Accounts.

- (a) Change in consumption is adjusted for the pre-crisis change in total debt, the level of total debt and the current account balance. See Flodén, M (2014), 'Did household debt matter in the Great Recession?', available at http://martinfloden.net/files/hhdebt_supplement_2014.pdf.

Chart A.5 UK households with higher levels of mortgage debt relative to income adjusted spending more sharply during the crisis

Change in consumption relative to income among mortgagors with different LTI ratios between 2007 and 2009^{(a)(b)(c)}



Sources: Living Costs and Food (LCF) Survey, ONS and Bank calculations.

- (a) Change in average non-housing consumption as a share of average post-tax income (net of mortgage interest payments) among households in each mortgage LTI category between 2007 and 2009.
- (b) LCF Survey data scaled to match National Accounts (excluding imputed rental income, income received by pension funds on behalf of households and FISIM). LTI ratio is calculated using secured debt only as a proportion of gross income.
- (c) Repeat cross-section methodology used, with no controls for other factors, or how households may have moved between LTI categories between 2007 and 2009.

a borrower defaults on a mortgage and the value of the house does not cover the outstanding mortgage, the lender has a claim against other assets of the debtor. This contrasts with some other jurisdictions, such as the United States, where 'non-recourse' mortgages are more widespread.

(1) See Bunn, P and Rostom, M (2015), 'Household debt and spending in the United Kingdom', *Bank of England Staff Working Paper No. 554*; www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp554.pdf.

Given the prevalence of short-term fixed-rate mortgage contracts, UK households are also particularly exposed to the risk of unexpected changes in interest rates.⁽¹⁾ Almost 80% of new mortgage lending in 2016 was either on a fixed rate for a period of less than five years or on a floating rate.

In summary, mortgage debt can be a source of risk for borrowers' ability to weather downturns without substantial cutbacks in their spending. UK household indebtedness is high, which can be a threat to the wider economy. Highly indebted households can cut back sharply on spending in response to adverse shocks to incomes or interest rates, putting downward pressure on economic activity and reducing the resilience of the financial system.

Mortgages are the largest loan exposure for UK lenders. They can be a source of risk for lenders' resilience, impairing the provision of credit.

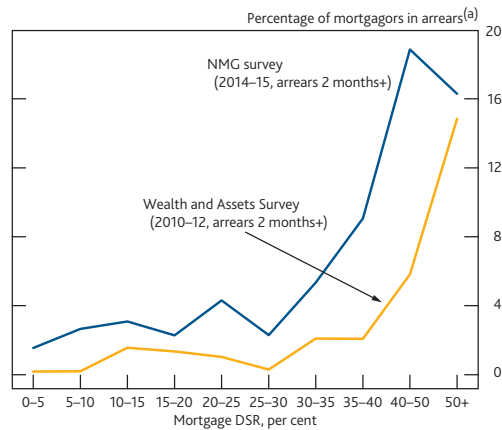
In a severe downturn, some borrowers will be unable to repay their mortgages even after cutting back on spending, for example, in the event of a rise in unemployment. The resulting defaults can affect lenders' resilience, with mortgages accounting for around two thirds of major UK banks' loans to UK borrowers.⁽²⁾

The proportion of households experiencing repayment difficulties can rise sharply as the share of income spent on servicing mortgage debt — also known as the mortgage debt-servicing ratio (DSR) — increases beyond a certain level (Chart A.6). Both the average DSR of the UK household sector as a whole and the proportion of households with high mortgage DSRs have fallen since the crisis, supported by the low level of interest rates. But households' ability to service their mortgage debt could be challenged by either a rise in mortgage rates or a fall in incomes. As an illustration, Bank staff estimate that in the event of a rise in unemployment to 8%, the proportion of households with high DSRs would double, reaching a level close to that seen in 2007 (Chart A.7).

During the global financial crisis, loss rates on mortgages were contained, reflecting the sharp fall in interest rates and a rise in unemployment that was relatively modest given the fall in economic activity.⁽³⁾ But in the 1990s recession, which was marked by a significant rise in interest rates and unemployment, loss rates were more material.⁽⁴⁾ And results from stress tests of major UK banks suggest that they could reach similar levels in future periods of severe stress (Chart A.8), particularly if house prices were to fall significantly, increasing lenders' losses in the event of borrower default.

Significant falls in house prices are highly correlated with economic downturns, when borrowers are also more likely to become unemployed and default on their mortgages. In such a severe stress, lenders are likely to incur larger losses on lending originally extended at high LTV ratios. This is because

Chart A.6 Households with high debt-servicing ratios (DSRs) are more likely to experience repayment difficulties
Households in two-month arrears by mortgage DSR

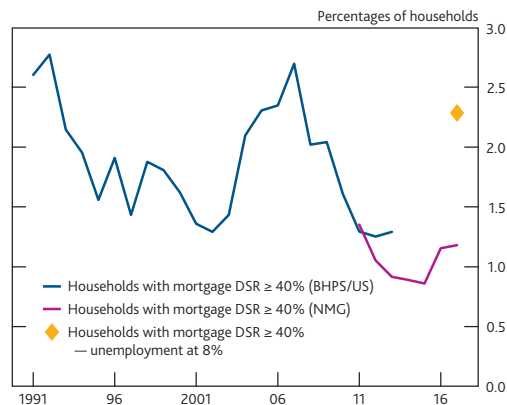


Sources: NMG Consulting survey, Wealth and Assets Survey and Bank calculations.

(a) The share of mortgage holders who have been in arrears for at least two months. The mortgage DSR is calculated as total mortgage payments (including principal repayments) as a percentage of pre-tax income. Calculation excludes those whose DSR exceeds 100%. Reported repayments may not account for endowment mortgage premia.

Chart A.7 An increase in unemployment could double the proportion of vulnerable households

Percentage of households with mortgage debt-servicing ratios of 40% or greater^{(a)(b)(c)}



Sources: British Household Panel Survey (BHPs), NMG Consulting survey, ONS, Understanding Society (US) and Bank calculations.

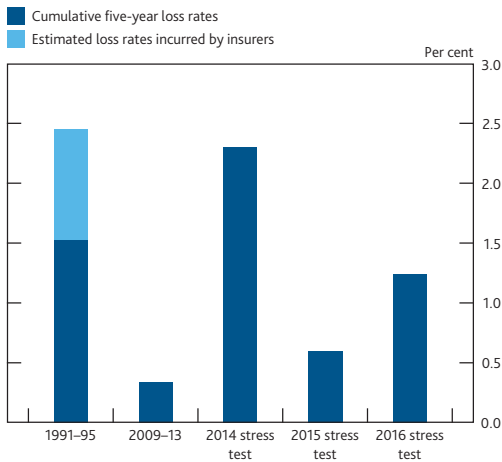
(a) Mortgage DSR calculated as total mortgage payments as a percentage of pre-tax income.
(b) Percentage of households with mortgage DSR above 40% is calculated using British Household Panel Survey (1991 to 2008), Understanding Society (2009 to 2013), and NMG Consulting survey (2011 to 2017).
(c) A new household income question was introduced in the NMG survey in 2015. Data from 2011 to 2014 surveys have been spliced on to 2015 data to produce a consistent time series. Data for 2017 come from the spring survey, while data from previous years come from the autumn survey.

such mortgages are more likely to experience 'negative equity' in the event of a fall in house prices, meaning that the value of the housing collateral will be less likely to cover the mortgage loan.

- (1) This has been a feature of the UK mortgage market for many years and was discussed in Miles, D (2004), *The UK mortgage market: taking a longer-term view*; http://webarchive.nationalarchives.gov.uk/20071204181447/hm-treasury.gov.uk/consultations_and_legislation/miles_review/consult_miles_index.cfm.
- (2) Unless otherwise stated, 'banks' or 'lenders' refer to all UK banks and building societies.
- (3) The distribution of unemployment was also skewed towards younger households, among whom the owner-occupier rate is lower.
- (4) Less developed credit scoring and credit risk management practices relative to today also help explain the high loss rates in the early 1990s.

Chart A.8 Loss rates on UK mortgages could reach material levels in a severe stress

Cumulative five-year loss rates on UK mortgages in past downturns and in stress tests^{(a)(b)(c)(d)(e)}



Sources: Acadametrics, Bank of England, lenders' stress-testing submissions and Bank calculations.

- (a) Cumulative loss rates are calculated as cumulative losses divided by average balances.
- (b) Losses defined as write-offs for the 1991-95 and 2009-13 periods and impairment charges for stress-test results.
- (c) 1991-95 write-offs include all banks and building societies and an estimate of the losses borne by the UK insurance industry on loans originated by banks and building societies. Based on data published by MIAC-Acadametrics.
- (d) Losses in 2009-13 and stress tests include the six major lenders.
- (e) Impairments in the 2014 stress test are cumulative over three years.

The provision of high LTV lending has increased from its post-crisis lows recently, but both the annual average total volume of high LTV lending and its share of total mortgage lending remain lower than at any point between 1982 and 2008 (Chart A.9). At the same time, LTV ratios for outstanding loans have fallen as a result of house price growth and mortgagors repaying existing debt. As a result, for example, only 2% of the major six lenders' stock of mortgages had an LTV above 90% at end-2016 (Chart A.10).

High mortgage debt can also affect lenders' resilience indirectly. In a downturn, highly indebted households prioritising mortgage payments may default on their other credit commitments, such as credit cards or personal loans. Sharp cuts in consumption that amplify the downturn can also lead to credit losses on other types of lending, for example loans to businesses.

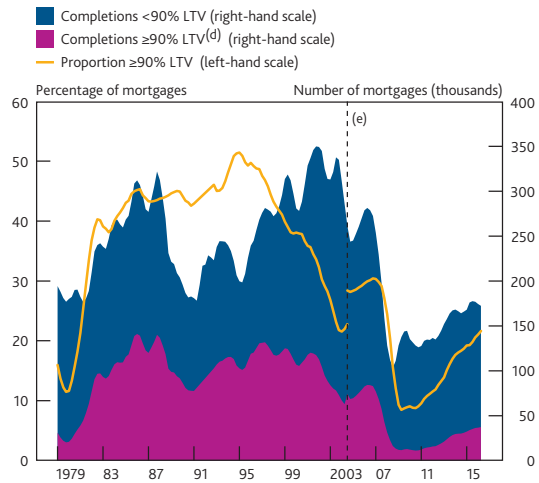
Overall, in a severe stress, high levels of mortgage debt could lead to significant losses (both directly and indirectly) and reduce the resilience of lenders, impairing the provision of credit to the real economy and further intensifying an economic downturn.

Self-reinforcing feedback loops between levels of mortgage lending and house prices can amplify risks to both borrowers and lenders.

Housing is the main source of collateral in the real economy, so higher house prices tend to lead to higher levels of mortgage lending, feeding back into higher

Chart A.9 High LTV mortgage lending remains lower than at any point between 1982 and 2008

New mortgage lending by LTV at origination^{(a)(b)(c)}

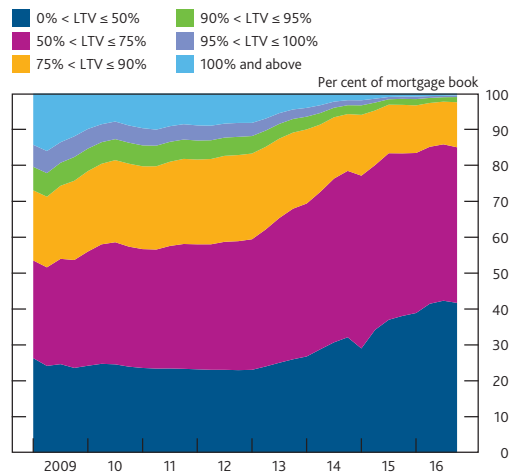


Sources: Council of Mortgage Lenders (CML), FCA Product Sales Database (PSD) and Bank calculations.

- (a) Data are shown as a four-quarter moving average.
- (b) Data include loans to first-time buyers, council/registered social tenants exercising their right to buy and home movers.
- (c) The PSD includes regulated mortgage contracts only.
- (d) The number of mortgage loans with ≥90% LTV is calculated using the aggregate number of mortgages from the CML and the proportion of mortgages with ≥90% LTV from the PSD.
- (e) PSD data are only available since 2005 Q2. Data from 1993 to 2005 are from the Survey of Mortgage Lenders, which was operated by the CML, and earlier data are from the 5% Sample Survey of Building Society Mortgages. The data sources are not directly comparable: the PSD covers all regulated mortgage lending whereas the earlier data are a sample of the mortgage market. Data for the first three quarters of 1992 are missing, chart values are interpolated for this period.

Chart A.10 The LTV distribution of the stock of mortgages has improved since the crisis

UK mortgage books by indexed LTV^(a)



Sources: PRA regulatory returns and Bank calculations.

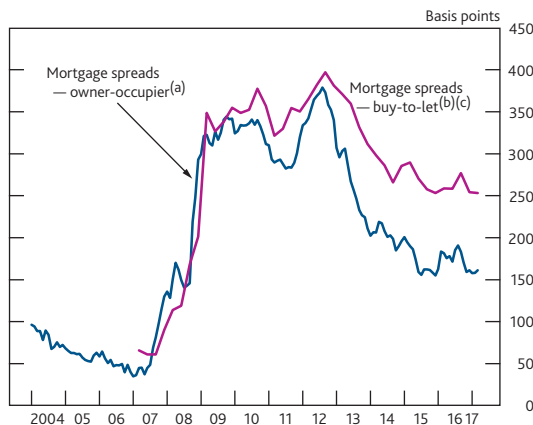
- (a) Peer group accounts for around 74% of total UK mortgages and includes the major UK lenders.

valuations. As valuations increase, rising wealth for existing homeowners and higher collateral values for lenders can increase both the demand for, and supply of, credit, leading to a self-reinforcing loop between levels of mortgage lending and house prices. Expectations of future house price increases can also prompt prospective buyers to bring forward house purchases. The resulting rapid growth in mortgage lending can amplify risks to both lenders and borrowers.

In an upturn, when risks from credit losses are perceived to be low, the underwriting standards lenders apply to decide on what terms to lend can deteriorate quickly as they seek to maintain or build market share. This increases the supply of credit further. Underwriting standards on UK mortgages weakened in the lead-up to the financial crisis, contributing to the growth in mortgage lending and house prices. Across a range of metrics, underwriting standards are now more robust relative to the period before the crisis. But market contacts suggest that lending conditions in the mortgage market are becoming easier and competitive pressures in the mortgage market remain. Mortgage spreads over risk-free rates have fallen materially since their peak in 2012 (Chart A.11). Lenders are also extending an increasing proportion of mortgages without fees. Forty-six per cent of mortgages were extended without fees in the first part of 2017, compared to 37% in 2016 and just 12% in 2011 (Chart A.12).

Chart A.11 Mortgage spreads have fallen

Mortgage rates on owner-occupier and buy-to-let lending relative to risk-free rates



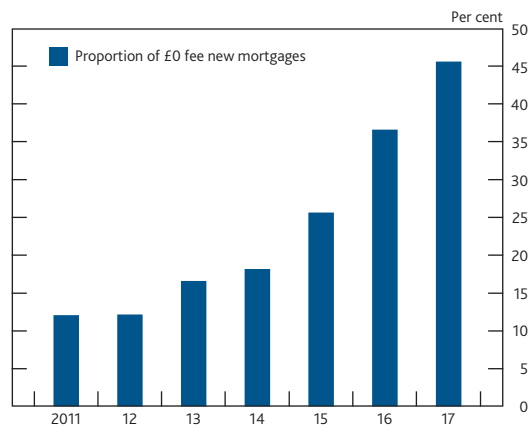
Sources: Bank of England, Bloomberg, Council of Mortgage Lenders, FCA Product Sales Database, Moneyfacts and Bank calculations.

- (a) The overall spread on residential mortgage lending is a weighted average of quoted mortgage rates over risk-free rates, using 90% LTV two-year fixed-rate mortgages and 75% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products. Spreads are taken relative to Bank Rate for the tracker product. Weights are based on relative volumes of new lending. The Product Sales Database includes regulated mortgages only.
- (b) The spread on new buy-to-let mortgages is the weighted average effective spread charged on new floating and fixed-rate non-regulated mortgages over risk-free rates. Spreads are taken relative to Bank Rate for the floating-rate products. The risk-free rate for fixed-rate mortgages is calculated by weighting two-year, three-year and five-year gilts by the number of buy-to-let fixed-rate mortgage products offered at these maturities.
- (c) Buy-to-let data are only available from 2007 as they are sourced from the Bank of England's Mortgage Lenders and Administrators Return (MLAR) which started being collected in 2007.

A similar feedback loop between house prices and credit also arises in a downturn. An economic slowdown can reduce house prices. Due to the role of housing as collateral, lower house prices reduce the demand for, and supply of, credit. Expectations of further price reductions, which can result in sales of houses at heavily discounted prices ('fire sales'), can further amplify house price falls, reinforcing the adverse feedback loop. The resulting deterioration in borrowers' and lenders' resilience will intensify a downturn (Figure A.1).

Chart A.12 The proportion of mortgages with no fees has increased

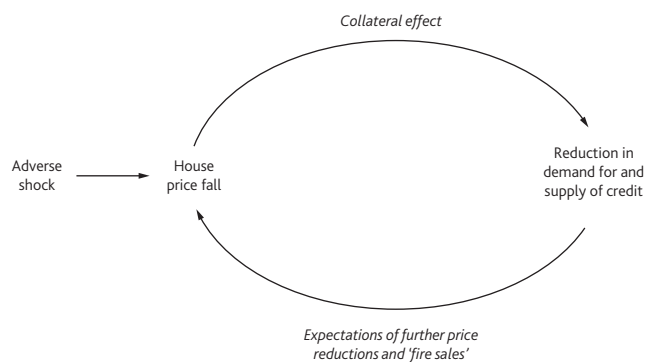
Proportion of new mortgages with no fees^(a)



Sources: Moneyfacts and Bank calculations.

- (a) The proportion of £0 fee products in each year is calculated relative to the total number of new mortgages offered during the year. The proportion in 2017 is calculated based on data from January to April 2017.

Figure A.1 Feedback loops between mortgage credit and house prices can amplify a downturn



Growth in the private rental sector in recent years may have led to growing risks of amplified house price cycles from leveraged buy-to-let investors.⁽¹⁾ The share of households in the private rental sector rose from around 10% in 2002 to 20% in 2016. Buy-to-let investors do not live in the house that they rent out and their behaviour is more likely to be driven by their expected returns on their housing investment than that of owner-occupiers. But if either house prices or the income received from rental payments were to fall materially, there is a risk that some leveraged investors may look to sell their properties quickly, reinforcing house price falls in a downturn.

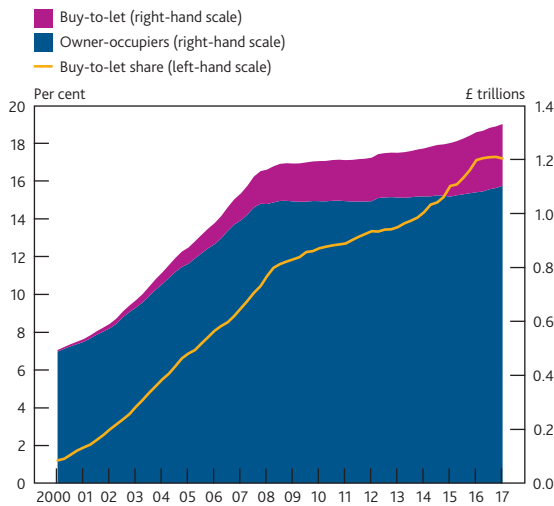
The size of the buy-to-let segment of the mortgage market has almost doubled since the period before the crisis (Chart A.13). So the impact of a growing share of leveraged investors on the dynamics of the broader market in a stress

(1) See Section 3.3 of Bank of England (2016), 'The Financial Policy Committee's powers over housing policy instruments', A draft Policy Statement; www.bankofengland.co.uk/financialstability/Documents/fpc/draftpolicystatement181116.pdf.

has yet to be tested. But there is evidence of this channel operating in the United States in the financial crisis. In those US states that experienced the largest housing booms and busts, at the peak of the market almost half of mortgage originations were associated with investors.⁽¹⁾

Chart A.13 The size of the buy-to-let segment of the mortgage market has almost doubled since the period before the crisis

Composition of the outstanding mortgage stock^(a)



Sources: Bank of England, Council of Mortgage Lenders and Bank calculations.

(a) Lending to owner-occupiers is calculated as outstanding lending to individuals secured on dwellings less outstanding lending secured on buy-to-let properties.

The FPC has taken action to mitigate risks to both borrowers' and lenders' resilience

Given the importance of the UK mortgage market for financial stability, the FPC and the Bank have taken action in recent years to mitigate risks to both borrowers' resilience, where this can impact broader economic activity, and to lenders' resilience.

In June 2014, the FPC introduced two Recommendations, which: limit the proportion of mortgages with high LTI ratios; and promote minimum standards for how banks test affordability for borrowers.

Also in 2014, following a Recommendation by the FPC, the Bank introduced annual stress tests of the UK banking system.

In September 2016, the PRA published a Supervisory Statement setting out its expectations for minimum underwriting standards on buy-to-let mortgages, in particular on how lenders test affordability.

Parliament has also given the FPC powers of Direction,⁽²⁾ which can cover both owner-occupier and buy-to-let mortgage lending.

Table A.1 summarises the Bank's toolkit to deal with risks from the UK mortgage market.

Table A.1 The Bank has an extensive toolkit to address risks from the UK mortgage market

	Owner-occupier	Buy-to-let
Loan to value policies	Loan to value limit	Loan to value limit
Affordability policies	Loan to income limit* Affordability test* Debt to income limit	Affordability test* Interest coverage ratio limit
Capital policies	Stress-testing framework* UK countercyclical capital buffer (CCyB) rate* ^(a) Sectoral capital requirements	

* Policies marked with an asterisk are currently in place.
(a) The CCyB is not a power of Direction, but the FPC is the designated authority to set the UK CCyB rate.

Colour scheme: FPC's power of Direction (pink), FPC's Recommendation (blue), PRA's Supervisory Statement (green). The Bank's annual stress test is conducted under the guidance of the FPC and the PRC.

Insuring against risks to borrowers' resilience
The FPC's Recommendations insure against a further significant rise in the number of highly indebted households and a marked loosening in underwriting standards.

The 'affordability test' Recommendation was designed to insure against a loosening in lenders' standards for assessing mortgage affordability. It builds on the FCA's rules that require lenders to assess whether prospective borrowers could afford their mortgage, taking into account their income, spending patterns and potential future interest rate increases.

At the time of the original Recommendation in 2014, most major lenders tested whether prospective borrowers could afford their mortgages assuming a stressed mortgage rate of around 7%. That compared with prevailing mortgage reversion rates⁽³⁾ in the region of 4%–4½%. In order to insure against a relaxation of those standards, the FPC recommended that all mortgage lenders should assess whether borrowers could still afford their mortgages if Bank Rate were to increase by 3 percentage points — the idea being that this increase would feed through to lenders' reversion rates, to result in a stressed mortgage rate in the region of 7%.

The affordability test can alternatively be interpreted as introducing a 'safety margin' between current mortgage payments and current incomes. This margin seeks to ensure that the household sector is better able to withstand fluctuations in income and employment. Bank staff estimate that the margin of safety created by assessing affordability

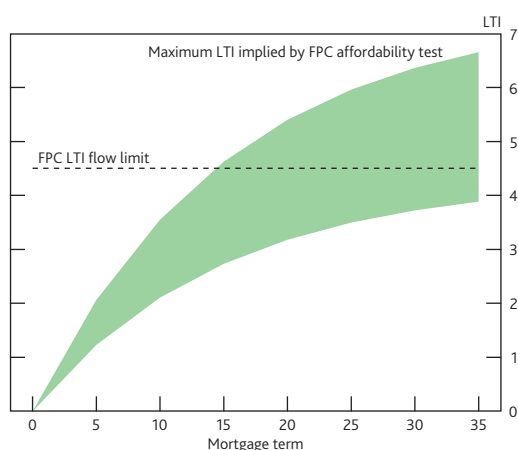
(1) See Haughwout, A, Lee, D, Tracy, J and van der Klaauw, W (2011), 'Real estate investors, the leverage cycle, and the housing market crisis', *Federal Reserve Bank of New York Staff Report No. 514*; www.newyorkfed.org/medialibrary/media/research/staff_reports/sr514.pdf.
(2) The FPC has two main powers. It can make Recommendations to anybody, including to the PRA and FCA. It can also, where the Government has given the FPC a power of Direction, direct the regulators to implement a specific measure to further the FPC's objectives.
(3) The reversion interest rate is the (typically floating) rate to which a mortgage reverts after an initial contractual period that is often based on a fixed interest rate.

against a 300 basis point rise in Bank Rate is equivalent to that needed by the household sector to be better able to withstand a 2–3 percentage point rise in unemployment.⁽¹⁾

The 'LTI flow limit' Recommendation limits the number of mortgages extended at LTI ratios of 4.5 or higher to 15% of a lender's new mortgage lending. The 4.5 multiple was calibrated to ensure that, at a stressed mortgage rate of 7% and a typical mortgage term of around 25 years, mortgagors' stressed DSRs would not exceed 35%–40%. That is the point beyond which the proportion of mortgagors that start experiencing repayment difficulties can rise sharply (Chart A.6). The 15% flow at or above the 4.5 threshold ensures that access to high LTI mortgages remains for those borrowers who can afford it.

The affordability test and the LTI flow limit complement each other in protecting households' ability to service their debt. The affordability test effectively sets an LTI cap for each borrower that depends primarily on the term of the mortgage, or 'tenor', and the borrower's spending commitments. The relationship between the effective LTI cap and the mortgage term is illustrated in Chart A.14. The swathe reflects variations in the effective cap, depending on the borrower's spending commitments and the precise stressed interest rate used by lenders to assess affordability.

Chart A.14 The affordability test and LTI flow limit complement each other in protecting households' ability to service their debt. Relationship between the affordability test and the LTI flow limit in constraining lending^{(a)(b)}



Source: Bank of England.

(a) Swathe for affordability test assumes borrowers have 30% to 50% of gross income available to support mortgage repayments, and lenders assess affordability at stress interest rates of 6.75% to 7%.

(b) The FPC flow limit restricts the share of new mortgages at LTIs of 4.5 or greater to 15%.

For borrowers seeking a relatively short mortgage term, the affordability test effectively places a lower cap on LTIs than the threshold implied by the LTI flow limit. This is because, at short tenors, a given loan amount will have higher debt-servicing costs due to higher capital repayments. In 2016, less than 20% of new mortgages had a tenor of fifteen years or less.

Chart A.14 also shows that the LTI flow limit can act as a simple backstop to the more complex affordability test: the LTI flow limit would be more likely to bind if mortgage terms increased, or if lenders loosened the standards through which they assess affordability (eg the approach to accounting for other spending commitments). Other things equal, such changes would move the effective LTI cap implied by the affordability test towards the top of the swathe.

The FPC judges that its Recommendations have had only a modest impact on mortgage lending to date.

In November 2016, the FPC reviewed the two Recommendations. The Committee assessed that, since their introduction in June 2014, they had had only a modest impact on mortgage lending, as lenders' own underwriting standards had not loosened. The Committee also judged that the Recommendations continued to insure against a deterioration in underwriting standards.⁽²⁾ The Committee retains both of these judgements.

LTI flow limit. In aggregate, lenders are advancing around 10% of new mortgages at LTIs at or above 4.5 (Chart A.15). So there remains headroom for further high LTI lending in aggregate. In February 2017, the PRA changed the relevant measure from a fixed quarterly limit to a four-quarter rolling limit, which should further help lenders manage their business pipeline.⁽³⁾

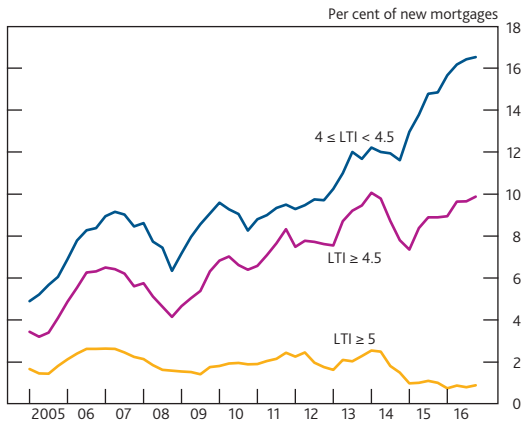
One feature of recent lending has been a 'bunching' of loans just below the FPC's 4.5 LTI limit. In part, this is likely to represent some individuals being constrained to smaller loans than they would have otherwise obtained. Bank staff estimate the size of this impact to be small in aggregate: for example, if the share of borrowers with an LTI between 4 and 4.5 were to be returned to its level before the FPC Recommendations were made, and the remaining borrowers in that category were to obtain an LTI of 5 instead, the value of total mortgage lending would increase by less than 1%.

Affordability test. The impact of the FPC's affordability test is more difficult to assess because the total number of prospective borrowers who fail the test is not directly observable. Nevertheless, in November 2016 the FPC judged that the Recommendation had not been excluding a significant number of borrowers. This was based on an

- (1) For example, analysis by Bank staff suggests that the proportion of households that would have a DSR greater than 40% in the face of an interest rate shock of 300 basis points is broadly equivalent to the proportion of households that would have a DSR greater than 40% in the face of an unemployment shock of around 3 percentage points. And empirical relationships between aggregate arrears and macroeconomic variables suggest that the proportion of households that would be in arrears if interest rates were to rise by 300 basis points is broadly equivalent to the proportion of households that would be in arrears if unemployment increased by just under 2%.
- (2) See the November 2016 Report for a more detailed discussion of the impact of the policies; www.bankofengland.co.uk/Pages/reader/index.aspx?pub=fsrnov16&page=1.
- (3) For further details on the PRA's change, see Bank of England (2017), 'Amendments to the PRA's rules on loan to income ratios in mortgage lending', *PRA Policy Statement PS5/17*; www.bankofengland.co.uk/pradocuments/publications/ps/2017/ps517.pdf.

Chart A.15 There remains headroom for further high LTI lending in aggregate

Flow of new mortgages by LTI^{(a)(b)}



Sources: FCA Product Sales Database and Bank calculations.

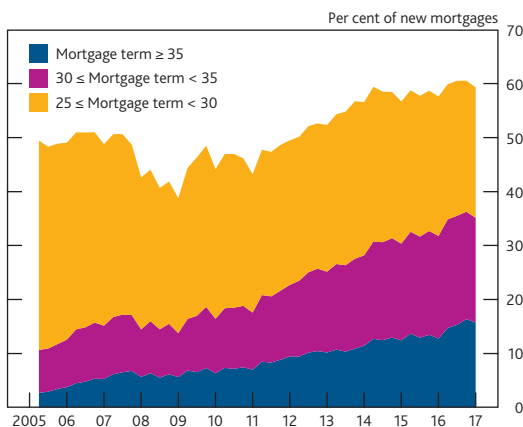
(a) The Product Sales Database includes regulated mortgages only.
 (b) LTI ratio calculated as loan value divided by the total reported gross income for all named borrowers. Chart excludes lifetime mortgages, advances for business purposes and remortgages with no change in the amount borrowed.

analysis of trends in mortgage applications and information received from a sample of lenders, suggesting that the calibration of the affordability test was not resulting in a material proportion of mortgage enquiries being rejected, even prior to the formal application stage. Two further pieces of evidence support this conclusion:

- First, while there has been a long-run trend towards longer mortgage terms since the crisis, there has been no acceleration in that trend since the introduction of the affordability test (Chart A.16). Were the policy to be excluding a large number of prospective mortgagors, borrowers could seek to pass the test by lengthening mortgage tenor, which lowers monthly repayments.

Chart A.16 There has been a long-run trend towards longer mortgage terms, but no acceleration more recently

Share of new mortgages by mortgage term^{(a)(b)}



Sources: FCA Product Sales Database and Bank calculations.

(a) The Product Sales Database includes regulated mortgages only.
 (b) Chart excludes lifetime mortgages, advances for business purposes and remortgages with no change in the amount borrowed.

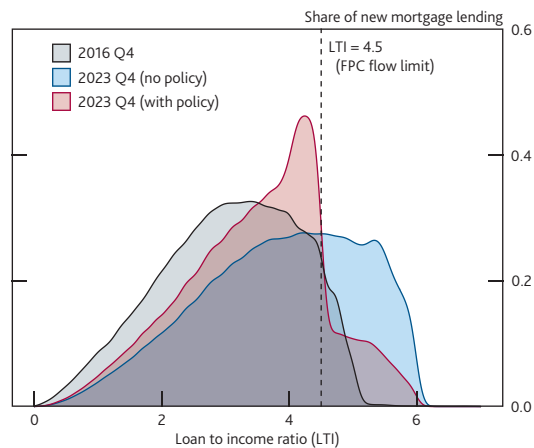
- Second, first-time buyers, who might have been expected to be most affected by any measure that restricts loan size relative to income, have maintained their share of total mortgage lending at around a third since 2014.

The FPC has further considered the possible impact of its Recommendations in different hypothetical scenarios. The Committee judges that, in the event that they were to become more binding relative to lenders' own underwriting standards, their benefits would also increase. The FPC expects them to remain in place for the foreseeable future.

As an example, in a hypothetical 'upside' scenario where a loosening of underwriting standards pushes mortgage lending higher and leads to an increase in the aggregate house price to income ratio, the absence of policies would lead to a significant increase in the number of highly indebted households. Specifically, the share of new mortgages extended at an LTI multiple at or above 4.5 would be 40% by the end of the scenario, compared with 13% if the policies were in place (Chart A.17). Over time, this would lead to a significant deterioration in the distribution of the stock of household debt.

Chart A.17 In an 'upside' scenario, the flow of mortgage lending would be skewed towards higher LTIs without FPC policies in place

LTI distribution of new mortgage lending^{(a)(b)}



Sources: FCA Product Sales Database and Bank calculations.

(a) The Product Sales Database includes regulated mortgages only.
 (b) LTI distribution of new mortgage lending in 2016 Q4 and at the end of an 'upside' seven-year scenario, with or without FPC Recommendations in place.

The benefits of the FPC's Recommendations under this scenario include:

- By limiting the number of highly indebted households, the policies reduce the potential for cuts in consumption in response to adverse shocks. There are significant uncertainties around the relationship between household indebtedness and cuts in consumption. But mapping estimates based on international evidence (Table A.2) onto the distribution of debt with and without policies suggests

Table A.2 More highly indebted mortgagors made larger spending cuts during the crisis

Cuts in consumption between 2007 and 2009 among mortgagors with different LTI ratios

LTI ratio	United Kingdom ^(a) (per cent)	Denmark ^{(b)(c)} (per cent)	Norway ^{(b)(d)} (per cent)
0 to 1	-1.4	1.2	1.9
1 to 2	-4.2	1.9	-6.3
2 to 3	-7.0	1.0	-11.5
3 to 4	-9.8	-2.3	-21.3
4 to 5	-12.6	-5.8	-28.9
5 to 6	n.a.	-7.9	n.a.

Sources: Andersen, Duus and Jensen (2014), Bunn and Rostom (2015), Fagereng and Halvorsen (2016) and Bank calculations.

(a) Predicted change in non-housing consumption between 2006–07 and 2009–10 associated with mortgage LTI ratio in 2006–07. Estimated using a synthetic panel approach with a range of control variables. See Table 2 in Bunn, P and Rostom, M (2015), 'Household debt and spending in the United Kingdom', *Bank of England Staff Working Paper No. 554*, www.bankofengland.co.uk/research/Documents/workingpapers/2015/swp554.pdf.

(b) Average predicted change in consumption between 2007 and 2009 as a share of income in 2007 for households. LTI calculated using total mortgagor debt, including unsecured loans. Estimated using econometric analysis of household-level administrative data featuring a range of control variables.

(c) See Chart 4 in Andersen, A L, Duus, C and Jensen, T L (2014), 'Household debt and consumption during the financial crisis', *Danmarks Nationalbank Monetary Review, 1st Quarter*, www.nationalbanken.dk/en/publications/Documents/2014/03/Household_MON1_2014.pdf.

(d) See Fagereng, A and Halvorsen, E (2016), 'Debt and household consumption responses', *Norges Bank Staff Memo No. 7*, http://static.norges-bank.no/contentassets/1dae87a5ddd94b4d871712bcf8791196/staff_memo_1_2016.pdf. Figures provided by the author to allow comparison with Andersen, Duus and Jensen (2014).

that the fall in aggregate consumption in the event of an adverse shock could, in this scenario, be up to around 20% larger.

- By limiting the deterioration in the stock of household debt, the policies further reduce the probability that households default on their mortgages.
- Finally, the Recommendations can also reduce the size of some adverse shocks in the future. For example, by preventing a marked loosening in underwriting standards, they reduce the risk of a self-reinforcing feedback loop between mortgage lending and house prices, which could amplify any fall in house prices.

The macroeconomic costs of the FPC's Recommendations arise from their impact on housing market activity — and therefore broader economic activity — in these scenarios.

- Because they constrain mortgage approvals in scenarios in which underwriting standards loosen, the FPC's policies may also have some effect on consumer spending. For example, moving house is often associated with a greater propensity to purchase durable goods, such as furniture and household appliances.⁽¹⁾ In the hypothetical 'upside' scenario, the Recommendations are estimated to reduce the level of nominal GDP by around 0.2% by the end of the scenario.
- The Committee further judges that it is unlikely that a restriction on mortgage credit supply would have a material effect on the economy's longer-term growth rate or productive capacity. So the costs of the policies would be temporary, while the benefits of increased resilience would persist.

In reaching its judgement, the FPC considered different scenarios constructed by staff. These pointed to the benefits of policy rising as it became increasingly binding relative to lenders' own underwriting standards.

The FPC's existing Recommendations cover the owner-occupier mortgage market. The FPC also has a power of Direction over interest coverage ratio (ICR) limits on buy-to-let mortgages. It has not yet used this power as it judges that the PRA Supervisory Statement currently provides adequate insurance against a loosening of underwriting standards in the buy-to-let market (Box 3).

Insuring against risks to lenders' resilience

The FPC's Recommendations protect the resilience of lenders by reducing the probability that new borrowers will default on their mortgages. They complement the framework of bank capital requirements, which seeks to ensure that lenders can withstand sharp economic slowdowns, including large falls in house prices, while continuing to lend.

Banks are required to hold more capital against riskier loans.⁽²⁾ For example, lenders allocate more capital to mortgages with higher LTV ratios (Chart A.18) because, in the event of a severe house price fall, higher LTV ratios would result in larger losses on defaulted mortgages.

The Bank's stress-testing framework assesses whether banks hold enough capital to withstand a severe stress and continue to lend to the real economy. The 'annual cyclical scenario' includes sharp falls in house prices (eg a 33% fall in the 2017 scenario). These stress scenarios are more severe if risks from the housing and mortgage market are judged to have increased, other things equal.⁽³⁾ And, for a given macroeconomic shock, losses in the stress test will increase with the riskiness of lenders' portfolios (eg due to more high LTV lending). Taken together, this leads to a countercyclical capitalisation of the banks, strengthening their resilience against risks from the mortgage market.

Where stress tests show banks need bigger buffers of capital to absorb the stress scenarios, the FPC can take action by raising the UK countercyclical capital buffer rate, and the

(1) See the box 'The housing market and household spending' on pages 18–19 of the November 2016 *Inflation Report*; www.bankofengland.co.uk/publications/Documents/inflationreport/2016/nov.pdf.

(2) Lenders have to be funded by capital in proportion to the risks they take. To compute the required amount of capital, lenders 'risk weight' their loans. They calculate risk weights either by using a 'standardised approach' set internationally or, if allowed by their national supervisor, by using their own risk parameters — the 'internal ratings based' (IRB) approach'.

(3) See Bank of England (2015), 'The Bank of England's approach to stress testing the UK banking system'; www.bankofengland.co.uk/financialstability/Documents/stresstesting/2015/approach.pdf.

Box 3

PRA Supervisory Statement on underwriting standards for buy-to-let mortgages⁽¹⁾

In 2016 the PRA undertook a review of lenders' underwriting standards in the buy-to-let market.⁽²⁾ The review revealed that some lenders were applying standards that were somewhat weaker than those prevailing in the market as a whole. A number of lenders and other firms planned to grow their gross buy-to-let lending significantly, so there was a risk that competitive conditions would lead more firms to relax underwriting standards to implement their plans.

In response, the PRA Board issued a Supervisory Statement to clarify its expectations for underwriting standards in the buy-to-let market. It set the baseline minimum stressed interest rate to be used in the affordability test at the higher of 5.5% or a 2 percentage point increase in buy-to-let mortgage interest rates.

Although the stressed interest rate is lower than that applied to owner-occupier mortgages in the FPC's Recommendation, lenders tend to test affordability using ICR thresholds of at least 125% (and, more recently, industry standards have been moving to 145% due to tax changes). So, effectively, these affordability assessments require borrowers' expected

monthly rental income from the buy-to-let property to include at least a 25% buffer over the monthly mortgage interest payment estimated using the stressed interest rate above.

In addition, LTV ratios at origination in excess of 75% are much less common in buy-to-let than in owner-occupier mortgages; in 2016, they accounted for around 10% and 45% of new mortgages respectively. Buy-to-let loans therefore typically start with a larger equity cushion, providing greater resilience to credit risk for lenders.

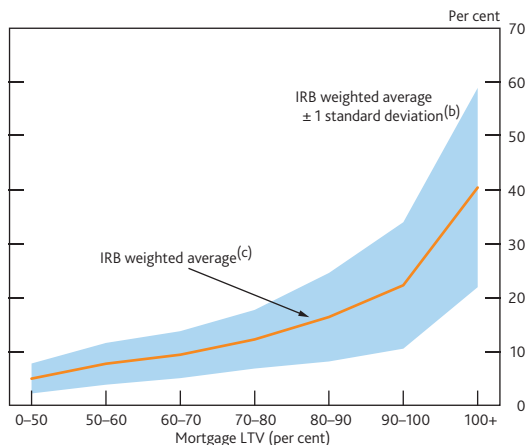
The FPC considers that no action beyond the PRA Supervisory Statement is warranted at this stage for macroprudential purposes. The growth of buy-to-let mortgage lending slowed significantly in April 2016 and has been weak since, due to the combination of changes to stamp duty land tax, changes to mortgage interest tax relief and the implementation of the PRA Supervisory Statement. The FPC will continue to monitor developments in the buy-to-let market and any potential threats to financial stability.

(1) Bank of England (2016), 'Underwriting standards for buy-to-let mortgage contracts', PRA Supervisory Statement SS13/16; www.bankofengland.co.uk/pradocuments/publications/ss/2016/ss1316.pdf. See the Record of the FPC meeting on 23 March 2016 for more details on the FPC's reaction to the PRA's review; www.bankofengland.co.uk/publications/Documents/records/fpc/pdf/2016/record1604.pdf.

(2) The review assessed the lending plans of the top 31 lenders in the industry, which represented over 90% of buy-to-let lending.

Chart A.18 Lenders allocate more capital to mortgages with higher LTV ratios

Risk weights on UK 'prime' mortgages by LTV^(a)



Sources: PRA regulatory returns and Bank calculations.

(a) Chart shows risk weights on 'prime' mortgages calculated under the internal ratings based (IRB) approach; it excludes buy-to-let mortgages, which tend to have higher risk weights. Non-defaulted mortgages only.

(b) Shows ± 1 standard deviation based on the sample of lenders.

(c) Average of UK lenders that use the IRB approach to calculate mortgage risk weights (ten UK lenders including the six major lenders) weighted by exposure.

Prudential Regulation Committee (which is responsible for promoting the safety and soundness of individual banks)⁽¹⁾ can raise the regulatory capital buffers of individual lenders.

The FPC has not yet used its powers of Direction over LTV limits. The Committee judges that the measures in place are proportionate to current risks (Box 4).

The FPC regularly reviews the calibration and implementation of its Recommendations

The FPC has withdrawn and replaced the affordability test Recommendation in order to promote consistency of implementation across lenders, with the aim of insuring against a future loosening in underwriting standards (Box 5). The new Recommendation states that:

When assessing affordability, mortgage lenders should apply an interest rate stress test that assesses whether borrowers could still afford their mortgages if, at any point over the first five years of the loan, their mortgage rate were to be 3 percentage points higher than the reversion rate specified in the mortgage contract at the time of origination (or, if the mortgage contract does not specify a reversion rate, 3 percentage points higher than the product rate at origination). This Recommendation is intended to be read together with the FCA requirements around considering the effect of future interest rate rises as set out in

(1) On 1 March 2017, as the PRA ceased to be a subsidiary of the Bank and its functions were fully transferred to the Bank, the PRA Board became the Prudential Regulation Committee.

Box 4

Powers of Direction over LTV limits

The FPC has not yet used its powers of Direction over LTV limits, either for owner-occupier or buy-to-let mortgages.

High LTV lending primarily poses risks to lenders. Resilience of lenders to these risks is afforded by the Bank's stress-testing framework, the broader capital regime and the FPC's existing Recommendations.

The Committee is also mindful that the LTI flow limit can effectively constrain the proportion of high LTV lending in some instances. An individual borrower's LTI and LTV are mechanically linked through the house price to income ratio:

$$\frac{\text{Mortgage loan}}{\text{Income}} = \frac{\text{Mortgage loan}}{\text{Value of house}} \times \frac{\text{Value of house}}{\text{Income}}$$

So for a given house price to income ratio, the greater a borrower's LTI, the greater their LTV.

Due to substantial variation in the ratio of house prices to incomes across different regions of the country, the LTI flow limit will not constrain high LTV lending in all circumstances. For example, in the South East, where house prices are higher relative to incomes, borrowers tend to have higher LTI ratios. Limits on high LTI lending effectively constrain high LTV lending too. In other regions, where house prices are lower relative to incomes, underwriting standards on LTI ratios are less constraining. This is illustrated in **Chart A**, which shows that more mortgagors in London and the South East have higher LTI ratios.

The FPC will keep under review the risks to lenders stemming from high LTV mortgage lending. It could in future consider

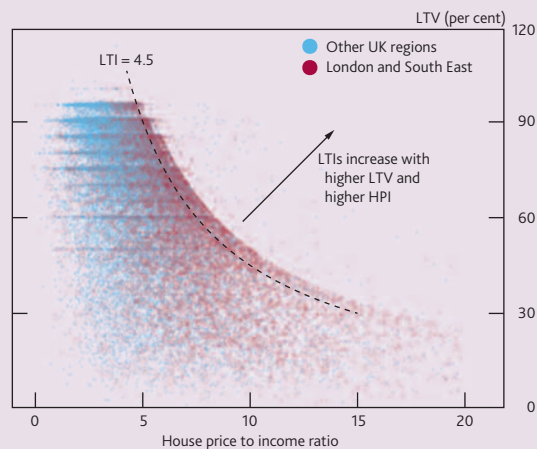
MCOB 11.6.18(2). This Recommendation applies to all lenders which extend residential mortgage lending in excess of £100 million per annum.

The FPC will continue to review the calibration of both the affordability test and the LTI flow limit regularly.

While the current policy package is likely to remain in place for the foreseeable future, the FPC will continue to review the calibration of the affordability test and LTI flow limit on a regular basis.⁽¹⁾ The following principles will guide its approach to considering the calibration of the policies in the future.

The FPC will review the calibration of the two Recommendations together. The affordability test and the LTI flow limit complement one another. For a given mortgage term and stressed mortgage rate, the two provide a broadly

Chart A There is greater scope for an increase in mortgage LTVs in regions outside London and the South East
Mortgages' LTV ratio and house price to income ratio^{(a)(b)}



Sources: FCA Product Sales Database and Bank calculations.

- (a) The Product Sales Database includes regulated mortgages only.
(b) The chart shows the house price to income ratio (HPI) and LTV combinations for a representative sample of new mortgages (excluding remortgages) in 2016. It splits off London and the South East (red dots) from other UK regions (blue dots). Each dot represents a mortgage. It also shows a constant-LTI line (LTI = 4.5) for various HPI and LTV combinations, reflecting their relationship: LTI = HPI * LTV. In London and the South East, where HPIs are higher, limits on high LTI lending effectively constrain LTVs.

employing LTV limits to insure against risks on owner-occupier or buy-to-let mortgages, as other macroprudential authorities have done in a number of countries.⁽¹⁾ However, the FPC judges that the combination of stress testing and bank capital requirements, alongside its existing Recommendations in the mortgage market, build a degree of lender resilience that is proportionate to current risks.

- (1) For international evidence on the impact of macroprudential measures in the housing market, see Box 1 in Bank of England (2016), 'The Financial Policy Committee's powers over housing policy instruments', A draft Policy Statement; www.bankofengland.co.uk/financialstability/Documents/fpc/draftpolicystatement181116.pdf.

equivalent constraint on the amount of borrowing prospective mortgagors could take on relative to their incomes (**Chart A.14**). As Bank Rate rises in the future, the affordability test could become more constraining on lending relative to the LTI flow limit. The Committee therefore intends to consider the balance between the two policies if and when Bank Rate rises to a level close to 1%.

The calibration of the policies will depend on the FPC's judgement around risks to both interest rates and incomes. Increases in Bank Rate lead to higher mortgage rates and, so, higher mortgage payments. Higher unemployment raises the

- (1) The FPC has a duty to review its Recommendations at regular intervals and consider whether they should remain in place or be withdrawn.

Box 5

The affordability test Recommendation

The new Recommendation states that lenders should test affordability by considering a 3 percentage point increase in their current reversion rate (for many lenders this is the standard variable rate, or 'SVR'), while the previous Recommendation stated that lenders should consider a 3 percentage point increase in Bank Rate.

So far, lenders have been using a range of approaches to calculate the stressed interest rate at which they test affordability — so there has been a lack of consistency across the market. Because the previous Recommendation was expressed as a 3 percentage point change in Bank Rate, it was open to different interpretations by lenders. For example, lenders could make different assumptions about whether the appropriate rate to use was the one at origination or the reversion rate. Indeed, there has been significant variation across lenders on the stressed mortgage rate used to assess affordability compared to their current SVRs. Around half of the mortgages extended in 2016 Q4 were tested using a stressed interest rate of SVR plus 2.75–3.25 percentage points. About 30% of mortgages were tested at a lower rate, and about 20% at a higher rate.

Lending conditions in the mortgage market are becoming easier and competitive pressures in the market remain. So there is a risk that lenders loosen the standard at which they test affordability, especially if there is significant scope for interpretation of the policy.

The new Recommendation promotes consistency of implementation across lenders and insures against the risk of loosening underwriting standards. It also ensures that

probability that borrowers suffer a reduction to their income, reducing the available resources to meet mortgage costs. Both types of shock increase mortgagors' DSRs, other things equal, and high DSRs have historically been associated with increases in arrears rates and falls in consumption.

The FPC will draw upon a range of indicators to inform its judgements around risks to interest rates and incomes. These include, but are not limited to: the distance between variables' current values and their estimated equilibrium values; and historical and international evidence on the scale of potential shocks. **When assessing potential future changes to interest rates, the Committee is more likely to be guided by slow-moving, 'structural' measures of interest rates than by market expectations of future interest rates.** Given the long-term nature of mortgage contracts, it judges

borrower affordability is tested in the event that the borrower is unable to refinance their mortgage at the end of the fixed-rate period, which is appropriate given that — in times of stress — some borrowers may be unable to do.

Although the new Recommendation will require some lenders to increase the stressed interest rate at which they test affordability, the aggregate impact on current mortgage lending is expected to be small. The amendment reinforces the insurance role of the FPC's measures.

- In 2016 Q4, the average stressed rate (weighted by the volume of new lending) was just over 6.8%. Bank staff estimate that with the new Recommendation it would have been just over 7%.⁽¹⁾
- Bank staff's central estimate is that, had the new Recommendation been in place in 2016, it would have reduced mortgage approvals by less than 0.5% relative to the previous Recommendation, with a slightly larger impact on smaller lenders than on the major lenders.
- The aggregate impact on actual lending is estimated to be small because, even if a lender increases its stressed interest rate, borrowers whose mortgage payments (calculated at the stressed rate) are low relative to their incomes will still pass the test.

Consistent with the LTI flow limit, the new affordability test Recommendation includes a '*de minimis*' threshold (set at £100 million of mortgage lending per annum) that exempts some lenders, to ensure proportionality.⁽²⁾

(1) The 2016 Q4 quarter has been chosen rather than the whole of 2016 to avoid comparability issues due to the Bank Rate cut in August 2016.

(2) The FPC will monitor lending done by firms below this threshold.

that it would be imprudent to rely too heavily on potentially volatile market-implied measures.

The FPC will consider the overall volume of mortgage lending in calibrating the LTI flow limit. The LTI flow limit is expressed as a share of new mortgage lending. If the total volume of mortgage lending were to increase materially, the FPC could consider recalibrating the LTI flow limit to ensure that the overall number of highly indebted households does not become excessively high.

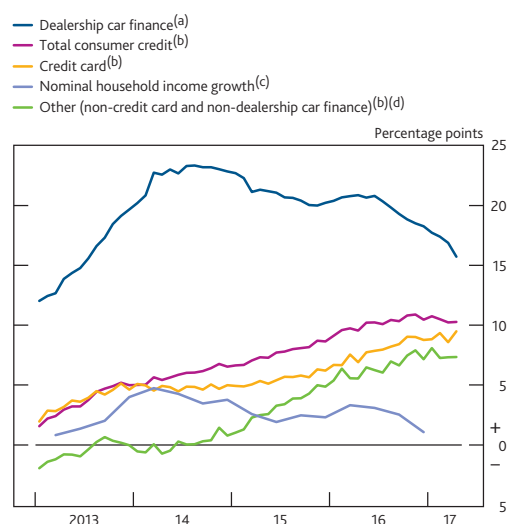
UK consumer credit

UK consumer credit has been growing rapidly. Loss rates on consumer credit lending are low at present. Partly as a result, banks' net interest margins on new lending have fallen and major lenders are using lower risk weights to calculate the capital they need to hold. Other things equal, these developments mean lenders have less capacity to absorb losses. In this context, a review by the PRA has found evidence of weaknesses in some aspects of underwriting and a reduction in resilience.

The FPC supports the intentions of the PRA and FCA to publish, in July, their expectations of lenders in the consumer credit market. Firms remain the first line of defence. Effective governance at firms should ensure that risks are priced and managed appropriately and benign conditions do not lead to complacency by lenders. The Bank's annual stress test assesses banks' resilience to risks in consumer credit. Given the rapid growth in consumer credit over the past twelve months, the FPC is bringing forward the assessment of stressed losses on consumer credit lending in the Bank's 2017 annual stress test. This will inform the FPC's assessment at its next meeting of any additional resilience required in aggregate against this lending.

Chart A.19 Consumer credit has been growing much faster than household incomes

Annual growth rates of consumer credit products and household income



Sources: Bank of England, ONS and Bank calculations.

- (a) Identified dealership car finance lending by UK monetary financial institutions (MFIs) and other lenders.
 (b) Sterling net lending by UK MFIs and other lenders to UK individuals (excluding student loans). Non seasonally adjusted.
 (c) Percentage change on a year earlier of quarterly nominal disposable household income. Seasonally adjusted.
 (d) Other is estimated as total consumer credit lending minus dealership car finance and credit card lending.

Consumer credit has been growing rapidly in recent years...

Lending to individuals in the form of consumer credit grew by 10.3% in the twelve months to April 2017. Though a little slower than in 2016 Q4, this was close to its fastest annual growth rate since 2005.

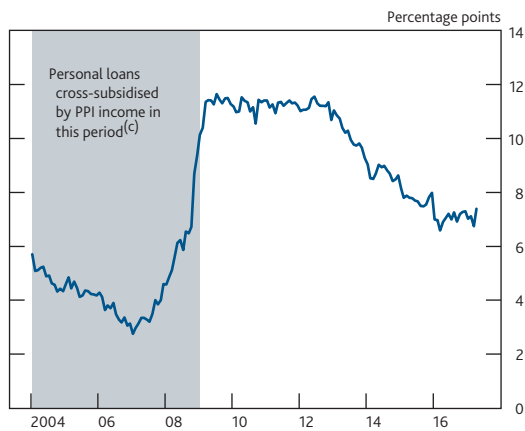
Consumer credit has been growing much faster than household incomes in recent years (Chart A.19). During that period, dealership car finance has seen the fastest expansion, though other forms of consumer credit (mainly credit cards and personal loans) accounted for more than half of consumer credit growth in the past year. Around half of net consumer credit lending in the twelve months to April 2017 was from banks, with major UK banks and smaller banks making broadly equal aggregate contributions to the annual growth rate. Lenders expect to continue to grow their portfolios through 2017, at the same time as real household income growth is expected to remain particularly weak. For an overview of the consumer credit market, see Box 6.

...reflecting a shift in the supply of credit...

Strong consumer credit growth in recent years partly reflects structural changes in the provision of consumer finance, including a shift towards the use of dealership car finance. Technological changes, such as online shopping and contactless cards, have also encouraged greater credit card use for transactional purposes, with transactional credit card balances growing at broadly the same rate as overall credit card balances between 2012 and 2016.

Chart A.20 Interest rates on new personal loans have been falling relative to risk-free rates

Spread between effective interest rates on new personal loans and Bank Rate^{(a)(b)}

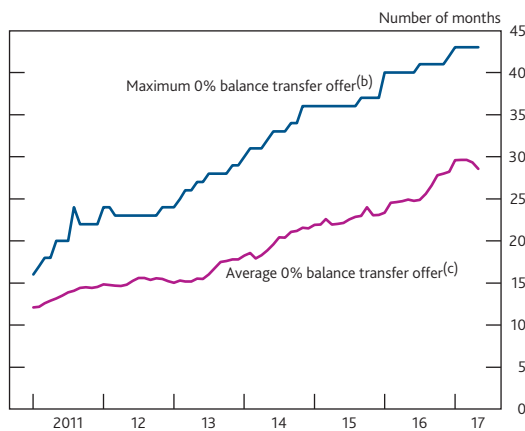


Sources: Bank of England and Bank calculations.

- (a) The Bank's effective interest rate series are currently compiled using data from up to 19 UK MFIs. Data are non seasonally adjusted.
 (b) Effective rates are sterling-only monthly averages.
 (c) Income from cross-selling of payment protection insurance (PPI) substantially offset low margins on personal loans during this period. For more details see www.bankofengland.co.uk/publications/Documents/quarterlybulletin/qb100301.pdf.

Chart A.21 Credit card lenders are offering longer interest-free periods

Interest-free periods of credit card balance transfer offers^(a)



Sources: Moneyfacts and Bank calculations.

- (a) Whole market end-month data, excluding values of zero and nil returns.
 (b) The maximum 0% balance transfer term available across all lenders.
 (c) The average 0% balance transfer term is the average of the maximum 0% balance transfer term available for each lender.

Respondents to the Bank's quarterly *Credit Conditions Survey* reported a loosening of unsecured credit availability to households in every quarter from end-2012 to end-2016. This partly reflects intense competition among lenders, as reported by market contacts, including those of the Bank's Agents, and by major lenders in the *Credit Conditions Survey*.

Interest rates on new personal loans have fallen since 2013 (**Chart A.20**), squeezing interest margins. Credit card lenders have been offering longer interest-free periods. The average interest-free period offered to new credit card customers on balance transfer offers has doubled since 2011 (**Chart A.21**).

...and relatively benign economic conditions recently.

The fall in pricing may also reflect lenders incorporating a relatively benign macroeconomic environment in their assessment of risk. Loss rates on consumer credit lending are low at present, with arrears rates on UK banks' consumer credit books in 2016 materially lower than their post-crisis average. If lenders place undue weight when assessing risk on the recent performance of loans, this could mask a build-up of vulnerabilities in the consumer credit market.

These developments leave lenders more vulnerable to losses in a stress...

All else equal, falling interest margins mean that less interest income is available for lenders to absorb losses on consumer credit lending. Average risk weights for consumer credit have also fallen in recent years, reducing the loss-absorbing capital required to fund these exposures (**Chart A.22**).⁽¹⁾

Falling margins do not appear to have been accompanied by a corresponding improvement in the underlying credit quality of new lending. For example, qualitative responses to the Bank's *Credit Conditions Survey* indicate that lenders have been loosening their credit scoring criteria for non-credit card unsecured lending since 2013. All else equal, this makes it easier for households with lower credit scores to access consumer credit.

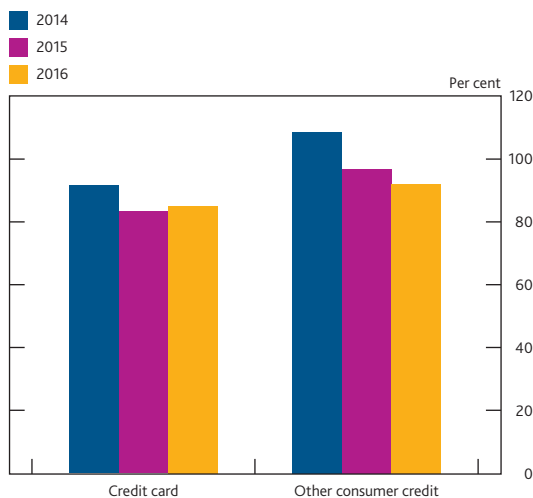
Joint Bank/FCA analysis of data from credit reference agencies further shows a slight deterioration in credit scores on new consumer credit lending between 2015 and 2017. This deterioration has occurred despite the fact that credit scores — which are used as an input to underwriting decisions by a number of lenders — can display elements of procyclicality. In a benign macroeconomic environment, more borrowers can access credit and are able to make regular payments, leading to an improvement in credit scores, all else equal.

The effects of any loosening in underwriting standards could be exacerbated by the rapid turnover of lenders' consumer credit portfolios. As a result of short payment terms, the stock

(1) Risk weights have not fallen for firms using the standardised approach to risk weights.

Chart A.22 Average consumer credit risk weights have fallen since 2014

Major UK banks' average risk weights on consumer credit exposures^(a)

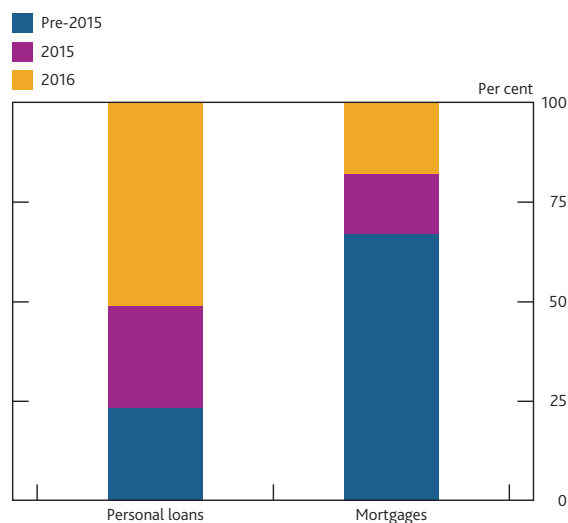


Source: Bank of England.

(a) Risk-weighted assets include both IRB and standardised exposures and are measured as a percentage of drawn balances for end-year periods 2014 to 2016.

Chart A.23 The stock of consumer credit turns over quickly

End-2016 mortgage and personal loan portfolios of major UK banks, by year of issuance^{(a)(b)(c)}



Source: Bank of England.

(a) Personal loan calculations have been made using vintaged data.
 (b) Peer group for personal loan data is made up of the major UK banks, representing around 75% of the total UK market.
 (c) Peer group for mortgage data represents around 74% of the total UK market, and includes the major UK banks.

of most forms of consumer credit turns over much faster than mortgages: at end-2016, around 75% of the major UK banks' outstanding personal loans had been issued in the previous two years, compared with about 30% of their mortgages (Chart A.23). The credit quality of the stock of lending can therefore deteriorate quickly.

...and could pose a risk to lenders' resilience.

Consumer credit accounts for less than 10% of major UK banks' stock of lending to UK real-economy borrowers, compared with around 70% for mortgage lending. But losses on consumer credit are far higher than for mortgages. That is because, in the face of adverse shocks, borrowers are much more likely to default on their consumer credit loans than their mortgages. And as the majority of consumer credit lending is unsecured, lenders cannot rely on the value of collateral to cushion their losses. Over the past ten years, UK banks' total write-offs on UK consumer credit lending have been ten times higher than on mortgages (Chart A.24).

Losses on consumer credit lending are highly correlated with changes in unemployment (Chart A.25). In the 2016 stress test, which included a 4.5 percentage point increase in the UK unemployment rate, stressed impairments on UK consumer credit exposures totalled around £18.5 billion. This compared with £11.8 billion of impairments for UK mortgages. Aggregate cumulative impairments on consumer credit were 19% of total exposures in the five years of the stress scenario, compared with 1% for mortgages.

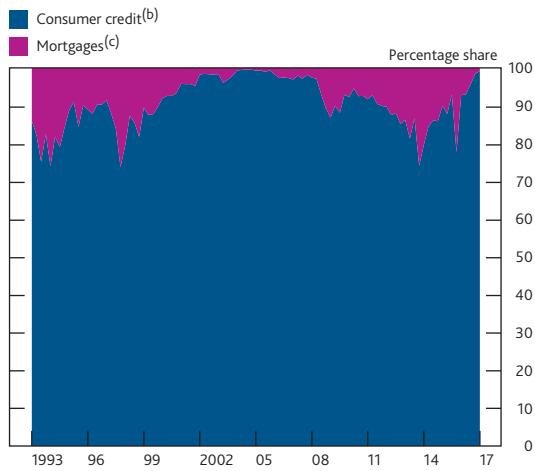
In this context, vigilance is warranted.

The PRA has undertaken a targeted review into the credit quality of consumer credit lending, and the FCA has been undertaking a review of its rules and guidance on creditworthiness assessments used in the consumer credit market. The PRA review has found evidence of weaknesses in some aspects of underwriting and a reduction in resilience. **The FPC supports the intentions of the PRA and FCA to publish, in July, their expectations of lenders in the consumer credit market. Firms remain the first line of defence. Effective governance at firms should ensure that risks are priced and managed appropriately and benign conditions do not lead to complacency by lenders.**

The Bank's annual stress-test exercise assesses banks' resilience to risks in consumer credit. Given the rapid growth in consumer credit over the past twelve months, the FPC is bringing forward the assessment of stressed losses on consumer credit lending in the Bank's 2017 annual stress test. This will inform the FPC's assessment at its next meeting of any additional resilience required in aggregate against this lending.

Chart A.24 Consumer credit losses are far higher than for mortgages

UK banks' sterling write-offs on lending to individuals^(a)

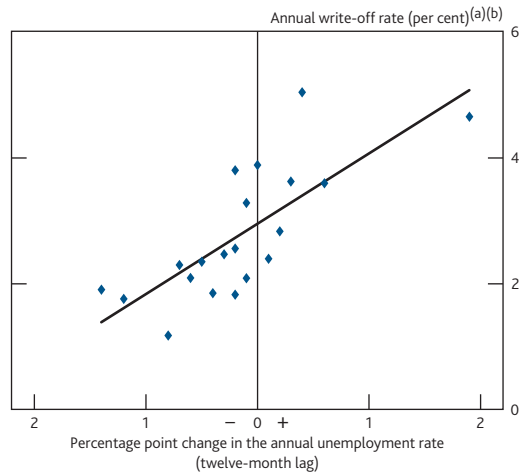


Sources: Bank of England and Bank calculations.

- (a) Write-offs of sterling lending by UK MFIs to UK individuals. Write-offs are net of recoveries. Non seasonally adjusted.
- (b) Consumer credit consists of credit card lending and other unsecured lending (other loans and advances) and excludes student loans.
- (c) Lending secured on dwellings.

Chart A.25 Consumer credit losses are highly correlated with changes in unemployment

Historical relationship between changes in unemployment and write-offs on non-credit card consumer credit exposures



Sources: Bank of England, ONS and Bank calculations.

- (a) Write-offs by UK MFIs on all currency other unsecured loans to UK individuals, expressed in sterling. Write-offs are net of recoveries. Non seasonally adjusted.
- (b) These series are calculated as annualised quarterly write-offs divided by the corresponding loans outstanding at the end of the previous quarter. These data are presented as annual series using four-quarter averages.

Box 6 Overview of the UK consumer credit market

In April 2017, the total stock of UK consumer credit was £198 billion. By comparison, the total amount of outstanding mortgage debt is around seven times larger at £1.3 trillion. Consumer credit accounts for less than 10% of UK banks' stock of lending to UK real-economy borrowers, compared with around 70% for mortgage lending. But it accounts for a much higher proportion of losses: since 2007, UK banks' total write-offs on UK consumer credit have been ten times higher than on mortgages.

The consumer credit market can be divided into three broad categories:

- Credit cards (34% of the stock of consumer credit).
- Dealership car finance (30% of the stock).
- 'Other' (36% of the stock), which is mainly made up of personal loans. This category also includes overdrafts, peer-to-peer lending, store credit, and lending from credit unions and small non-bank money lenders such as pawnbrokers and payday lenders.⁽¹⁾

The consumer credit market is highly diverse, with a wide range of products and lenders. But there are some common features across product types:

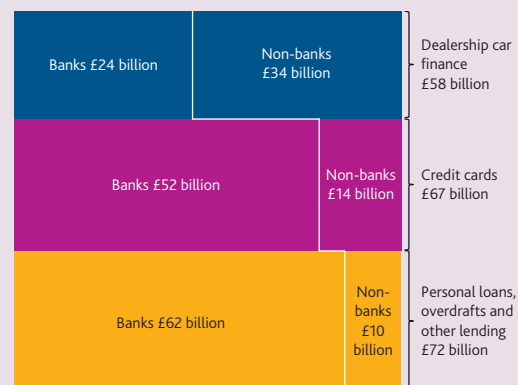
- *Short terms*: most consumer credit lending is at maturities of five years or less (apart from revolving facilities such as credit cards or overdrafts).
- *Higher interest rates*: while interest rates vary considerably across product types, they are typically materially higher than for mortgages. This reflects a lack of collateral for most consumer credit products, and is intended to compensate the lender for the higher risk of losses.
- *Fixed rates*: most consumer credit products have interest rates that are fixed for the entire term of the loan.

Banks provide around 80% of lending in the credit card and 'other' categories, but less than half of dealership car finance (Chart A).

Credit cards

There are two main ways of using credit cards: 'transactional' and 'revolving'. Transactional credit card users repay their full balances at the end of the month, and so incur no interest payments. Users with revolving balances roll over some of their debt from month to month, typically paying a relatively high interest rate (around 20%) on this borrowing.

Chart A Composition of the stock of consumer credit, end-March 2017^{(a)(b)(c)}



Sources: Bank of England, Finance & Leasing Association, published accounts and Bank calculations.

(a) Banks include monetary financial institutions (MFIs) and, where identified, non-bank subsidiaries of UK MFIs.

(b) Excludes income-contingent student loans.

(c) Numbers may not sum to totals because of rounding.

Some revolving credit card balances incur no interest. Under a typical 'balance transfer' offer, borrowers move existing debt onto a new card, in some cases paying an upfront fee. For a set period they then pay 0% interest on this balance, while paying down a proportion of the outstanding balance (typically a minimum of 1% per month, plus nominal fees). At the end of the 0% offer period, interest is charged on any outstanding debt at a standard rate. Other interest-free offers allow customers to accrue new debt at 0% interest for a period on new purchases or money transfers.

The major UK banks have around £42 billion of outstanding credit card lending — around 19% of their common equity Tier 1 (CET1) capital.

Other consumer credit

The bulk of this category is made up of unsecured personal loans, which typically have a three to five-year maturity at a fixed interest rate. Just over a quarter of personal loans are taken out for the purposes of debt consolidation, with most of the remainder funding large purchases such as home improvements.

The major UK banks have around £41 billion of 'other' consumer credit lending — around 19% of their CET1.

Dealership car finance

'Dealership car finance' refers to loans offered to car buyers at the point of sale. Traditionally, this takes the form of a hire purchase agreement. Under a standard hire purchase, the customer pays a fraction of the car's purchase price as a deposit, and takes out a loan to cover the rest, which is paid off with interest in regular monthly instalments, amortising fully.

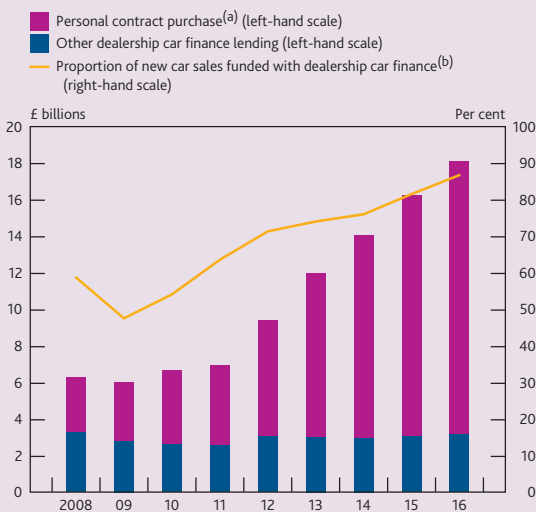
(1) The Bank's headline measure of consumer credit excludes income-contingent student loans.

'Personal contract purchase' (PCP) agreements are a type of hire purchase agreement with lower monthly payments. At the end of the loan period customers have the option to make a pre-agreed 'balloon payment' or return the vehicle to the dealer. The size of this balloon payment is set when the loan is issued, based on the estimated value of the vehicle in the used car market at the end of the loan period.

Dealership car finance has been growing rapidly in recent years, with an average annual growth rate of around 20% since 2012. The total stock of dealership car finance increased by more than £30 billion over that period, representing three quarters of total growth in the stock of consumer credit.

This growth partly reflects a recovery in the car market: total new car registrations in 2016 were 30% higher than in 2012. It also reflects a structural shift in how cars are purchased. Around 85% of new car purchases used dealership car finance in 2016, compared with about half in 2009. In particular, use of PCP agreements has grown rapidly (Chart B).

Chart B Value of annual dealership car finance for new car purchases, and proportion of private new car purchases funded with dealership car finance



Sources: Finance & Leasing Association, Society of Motor Manufacturers and Traders (SMMT) and Bank calculations.

(a) Annual sterling gross lending to individuals on dealership car finance for new car purchases provided by Finance & Leasing Association members, attributed to personal contract purchase (PCP).

(b) Annual transactions on dealership car finance for new car purchases provided by Finance & Leasing Association members, as a proportion of SMMT new car registrations.

A significant share of dealership car finance is provided by subsidiaries of global car manufacturers. Around half of the debt funding for these subsidiaries comes from their parent companies, around a quarter from securitisation, with the remainder from bank lending.

Bank staff estimate major UK banks' total exposures to UK car finance to be around £20 billion, or 9% of CET1, comprising:

- **Direct exposures** — around **£17 billion**, or 8% of CET1. This largely represents lending by banks' asset finance subsidiaries, which make loans to car buyers, arranged through dealerships.
- **Indirect exposures via lending to UK finance subsidiaries of car manufacturers** — around **£2 billion**, less than 1% of CET1.⁽¹⁾
- **Indirect exposures via holdings of asset-backed securities in banks' liquid asset buffers** — around **£1 billion**, less than 0.5% of CET1.

Arrears rates on dealership car finance tend to be lower than for other forms of consumer credit. Unlike most other consumer credit, this lending is secured, with the vehicle acting as collateral. But the value of this collateral declines over time, and is dependent on conditions in the used car market.

Exposures to PCP lending may be particularly sensitive to market conditions: if the borrower chooses to return the car at the end of the loan, and the value of the used car is less than the outstanding loan amount, the lender will make a loss. Lenders can seek to mitigate these risks by making conservative assumptions about the future value of used cars, though these assumptions are inherently uncertain.

In a hypothetical scenario where car values at the end of contracts turn out to be 20% lower than expected by lenders at origination — and all PCP borrowers returned their vehicles — Bank staff estimate that market-wide PCP losses could be 3%–6% of the total outstanding stock of car finance. Other things equal, if these loss rates were experienced on the major UK banks' dealership car finance portfolios, it would imply a reduction of 2–7 basis points in major UK banks' aggregate CET1 ratio.⁽²⁾ That is, from a starting point of 13.92%, the ratio would fall to 13.85%–13.90%. Market-wide losses would rise to 7%–10% of the outstanding stock in a more severe scenario where car values at the end of contracts turn out to be 30% lower than originally expected. If these loss rates were applied to major UK banks' portfolios, they would imply a reduction of 7–11 basis points in their aggregate CET1 ratio.

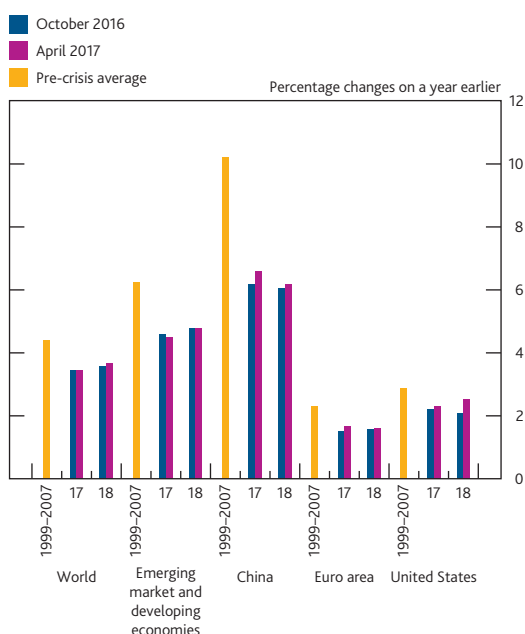
(1) Major UK banks also have over £10 billion of lending to global car manufacturers, but these exposures are less directly linked to the UK car market.

(2) Given direct exposures of £17 billion, a 5% loss rate implies a loss of £0.85 billion.

Global environment

Near-term growth prospects for the global economy have improved slightly and some possible risks have not crystallised. But financial vulnerabilities in China remain pronounced as, although capital outflows have stabilised, economic growth continues to be accompanied by rapid credit expansion. In the euro area, bank equity prices have risen, reflecting expectations of stronger economic growth and further progress in strengthening banks' capital positions.

Chart A.26 Global growth projections have been revised up slightly, though they are still below pre-crisis levels
International annual GDP growth projections



Sources: IMF *World Economic Outlook (WEO)* and Bank calculations.

Near-term prospects for the global economy have improved slightly...

Since the November 2016 *Report*, the near-term global economic outlook has improved slightly. In April, for the first time since 2011, the International Monetary Fund (IMF) revised up its forecast for world GDP growth in 2017, to 3.5% from 3.4% (Chart A.26). In May, the Monetary Policy Committee's projection for average annual global GDP growth, weighted by countries' share in UK exports, was 2½% in 2017–19. This is up from 2¼% in November, partly due to stronger growth prospects in the euro area.

The US Federal Open Market Committee raised its policy rate by 25 basis points in December, March and again in June. These increases were in line with market expectations and yields on US ten-year Treasury bonds have fallen by close to 20 basis points since the November *Report*,⁽¹⁾ offsetting around a third of the rise in US bond yields that followed immediately after the US election. These developments have helped to ease external financing pressures on emerging market economies (EMEs), though vulnerabilities from high levels of debt remain.

...though geopolitical and policy uncertainties remain high.

While uncertainty about the outlook for US fiscal policy remains, some other aspects of the new US administration's economic policy have become clearer. In particular, the agreement between the United States and China to liberalise bilateral trade in certain food products and financial services, and signs that the United States will seek to renegotiate, rather than withdraw from, the North American Free Trade Agreement have eased some immediate concerns about the future of the global trading system. Nevertheless, political and policy uncertainties, in particular about the prospects for a longer-term shift towards protectionism or for a weakening in global co-operation in financial regulation, remain high.

As home to the leading international financial centre, the resilience of the UK financial system depends in part on

(1) The data cut-off for the November *Report* was 18 November 2016.

standards applied in other jurisdictions. Absent consistent implementation of standards internationally and appropriate supervisory co-operation, the FPC will need to assess how best to protect the resilience of the UK financial system.

In China, foreign reserves have stabilised and capital outflows have fallen...

Pressure from persistent capital outflows from China has eased. The Institute of International Finance (IIF) estimates that the net outflow of capital from China was around US\$42 billion in the first four months of 2017, down from around US\$250 billion in the previous four months. China's official foreign exchange reserves were broadly stable in the first five months of 2017. This stabilisation appears to reflect a combination of tighter controls on capital movements by the Chinese authorities, higher policy rates in China and a weakening in expectations of an appreciation in the US dollar.

...but credit has continued to grow rapidly.

However, underlying vulnerabilities remain pronounced. Total social financing, a broad measure of domestic private sector credit, rose by 15.4% in the year to May 2017;⁽¹⁾ total non-financial sector debt was estimated to be just under 260% of GDP (**Chart A.27**). In addition to raising policy rates, the Chinese authorities have tightened bank regulation in order to reduce leverage in the financial sector. This will push up market rates further, making it more difficult for borrowers to service their debts. The authorities have also set a target for economic growth of 'around 6.5% or higher' in 2017, and continued credit growth is expected to be an important tool for achieving this, making their task of reducing medium-term risks to financial stability more challenging. If these risks were to crystallise, economic growth in China would slow sharply, leading to a sharp fall in Chinese imports and weaker growth in its trading partners. This could have a larger effect globally than previously, given that China is becoming a more important trading partner for many economies (**Chart A.28**).

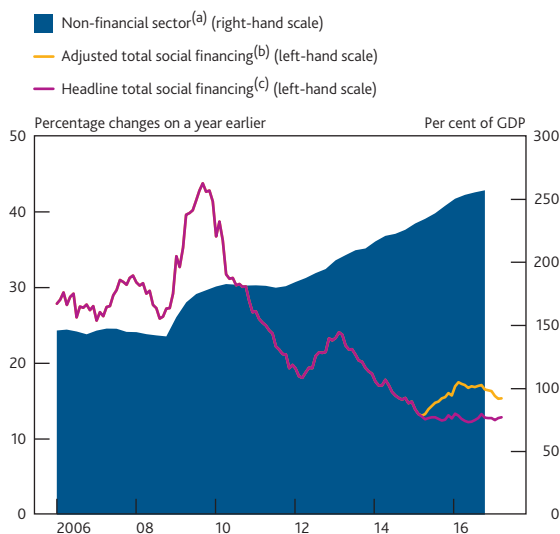
UK banks' exposures to China and the closely linked economy of Hong Kong are large (around US\$535 billion, 183% of common equity Tier 1 capital, **Chart A.29**).

Other EMEs have seen a resumption of portfolio inflows.

After a brief period of outflows in late 2016, there have been substantial inflows of non-resident portfolio capital to other EMEs. Credit-GDP gaps and current account deficits in many EMEs have also continued to narrow. However, external debt, often taken out by the private sector and denominated in US dollars, remains high in many individual EMEs. This may leave some countries like Turkey with weaker credit ratings and high borrowing needs (the IMF projects that maturing external debt in Turkey will be nearly 20% of GDP each year in 2017–19) exposed to a shift in risk appetite away from EMEs, a

Chart A.27 Credit continues to grow rapidly in China

China non-financial sector debt and growth of total social financing

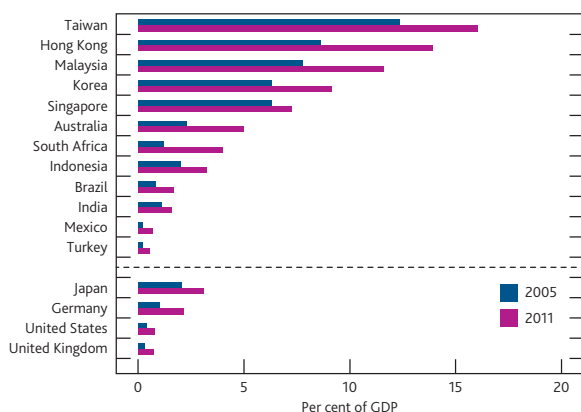


Sources: BIS total credit statistics, CEIC and Bank calculations.

- (a) Non-financial sector debt data are to 2016 Q4. Includes lending by all sectors at market value as a percentage of GDP, adjusted for breaks.
 (b) Total social financing adjusted for net issuance of local government bonds.
 (c) The People's Bank of China stock of total social financing used from December 2014 onwards. Prior to this the stock of total social financing is estimated using monthly 'newly increased' total social financing flows.

Chart A.28 Exports to China account for an increasing share of value added in many countries

Domestic value added in exports to China

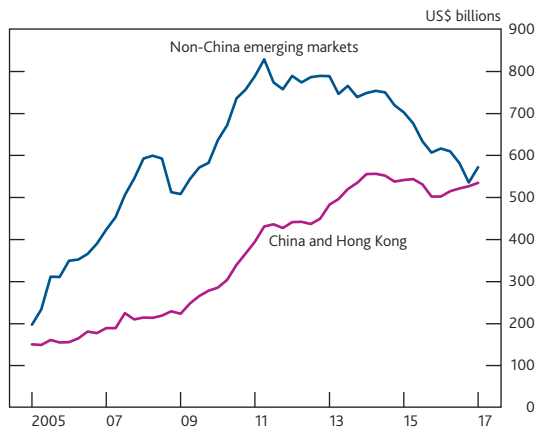


Sources: OECD Trade in Value Added database and Bank calculations.

(1) After adjusting for the statistical effect of replacing local government borrowing through financing vehicles with the issuance of municipal bonds.

Chart A.29 UK banks' claims on non-China EMEs have fallen back to broadly match those on China and Hong Kong

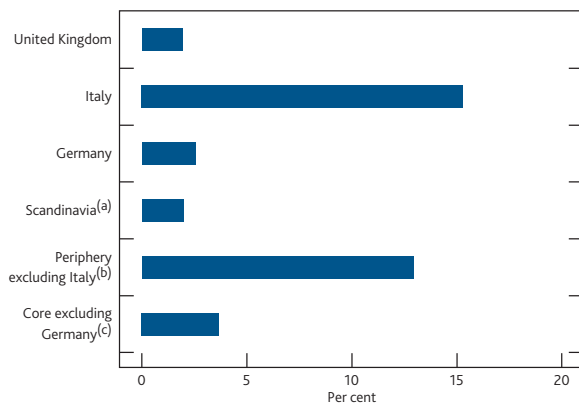
UK-owned banking groups' consolidated exposures to selected countries and regions



Sources: Bank of England and Bank calculations.

Chart A.30 Non-performing loan ratios are still high for banks in some European countries

Ratio of non-performing loans and advances to total loans and advances (2016 Q4)



Sources: European Banking Authority and Bank calculations.

(a) 'Scandinavia' refers to banks in Denmark, Norway and Sweden.

(b) 'Periphery excluding Italy' refers to banks in Ireland, Portugal and Spain.

(c) 'Core excluding Germany' refers to banks in Austria, Belgium, France and the Netherlands.

faster-than-expected rise in US interest rates or a renewed strengthening in the US dollar.

UK banks' exposures to non-China EMEs have fallen in recent years and broadly matched those to China and Hong Kong in 2017 Q1 (Chart A.29).

Pressures on the European banking system have eased but concerns about profitability remain.

Bank equity prices in continental Europe have continued to recover since the November Report. The improved economic outlook is expected to increase the demand for credit and also to lead to lower provisions for non-performing loans; both will tend to raise bank earnings. In addition, successful capital-raising exercises by three major European banks, progress towards recapitalising some smaller Italian banks and the orderly resolution of a domestically significant Spanish bank, have eased some immediate concerns about the resilience of the banking sector.

Euro-area banks' common equity Tier 1 capital ratios are significantly higher than before the crisis. However, non-performing loans remain at high levels in several European countries (Chart A.30) and concerns about the longer-term viability of some European banks' business models remain. In particular, the profitability of some European banks appears to be lower than the cost of raising new capital, which could make it difficult for them to rebuild their capital positions if they were to be hit by adverse shocks.

Sovereign bond spreads in the euro area have fallen but government debt is still high in several economies.

Sovereign bond spreads in several euro-area Member States rose in early 2017, reflecting heightened uncertainty ahead of elections in a range of countries. They have since fallen back as the parliamentary election in the Netherlands (March 2017) and the presidential election in France (May 2017) passed without major shocks to markets. However, government debt is still high in several euro-area economies. Italy, where government debt was 133% of GDP in 2016, remains a particular concern. Risks from the euro area may also emerge as a consequence of the United Kingdom's withdrawal from the European Union (see Box 2).

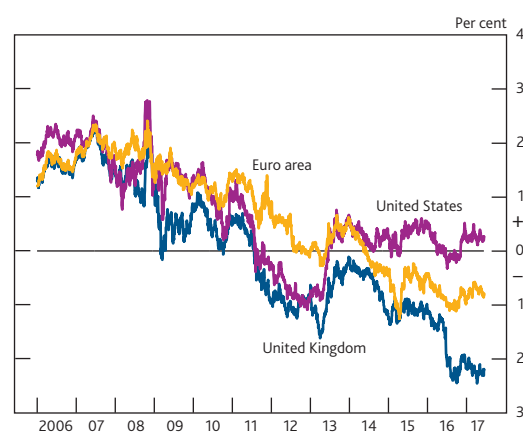
The FPC continues to assess UK banks' ongoing resilience to the risks stemming from China and the euro area in its annual stress test. The 2017 stress test includes an extremely severe scenario for China in which Chinese growth slows from just under 7% at the end of 2016 to -1.2% by the end of 2017, reflecting the scale of risks created by rapid credit expansion.

Asset valuations

Long-term risk-free interest rates are at levels consistent with pessimistic growth expectations and high perceived tail risks. In contrast, measures of uncertainty implied by options prices are low. Some asset valuations, particularly for some corporate bonds and UK commercial real estate, appear to factor in a low level of long-term market interest rates but do not appear consistent with the pessimistic and uncertain outlook embodied in these rates.

These asset prices are therefore vulnerable to a repricing, whether through an increase in long-term interest rates or adjustment of growth expectations, or both. A sudden fall in asset prices could be amplified given reduced liquidity in some markets, particularly if some types of investors increase sales in response to price falls. The resilience of the UK banking system to these repricing risks is being assessed through the 2017 stress test.

Chart A.31 Advanced-economy risk-free real interest rates remain close to historically low levels
International ten-year real government bond yields^(a)



Sources: Bloomberg and Bank calculations.

(a) Zero-coupon bond yields derived using inflation swap rates. UK real rates are defined relative to RPI inflation, whereas US and euro-area real rates are defined relative to CPI and HICP inflation respectively.

Long-term risk-free interest rates are at levels consistent with pessimistic growth expectations and high perceived tail risks...

In the United Kingdom, ten-year real government bond yields are at around -2% (Chart A.31), and long-term real interest rates remain low across the G7. While reflecting, in part, monetary policy actions over most of the past decade, these low interest rates — which are adjusted for compensation for inflation — also appear to be consistent with pessimistic growth expectations (despite recent improvements to the near-term outlook), and high perceived tail risks. Those perceptions may in part be associated with a high degree of geopolitical uncertainty (see Global environment chapter). If severe, but plausible, downside risks were to materialise, they could lead to a sharp reduction in growth, increasing the attractiveness of longer-term government bonds relative to more risky assets, such as equities and corporate bonds.⁽¹⁾

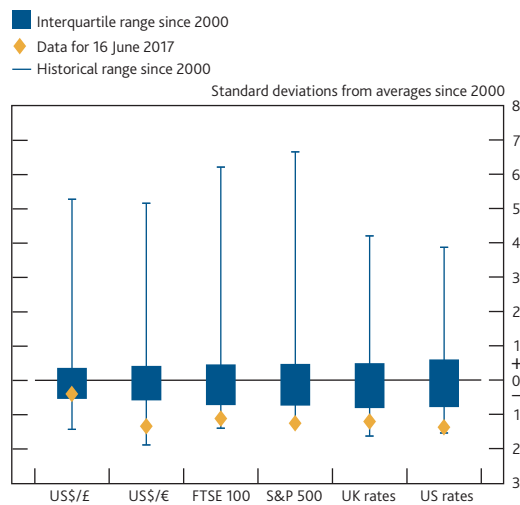
...but measures of uncertainty implied by options prices are low...

Market-based measures of perceived risks in the near term — or implied volatilities — have been low by historical standards across a number of markets (Chart A.32). These measures are derived from the options used to insure against asset price moves. The current low level of these measures may suggest that there is a relatively low expectation that geopolitical risks will actually materialise, at least over short horizons. In June, the VIX measure of implied equity volatility, derived from S&P 500 stock index option prices, reached its lowest level since 1993.

(1) See Broadbent, B (2014), 'Monetary policy, asset prices and distribution'; www.bankofengland.co.uk/publications/Pages/speeches/2014/770.aspx.

Chart A.32 Implied volatilities are low across a range of financial markets

Dispersion in implied volatilities in foreign exchange, interest rate and equity markets^(a)

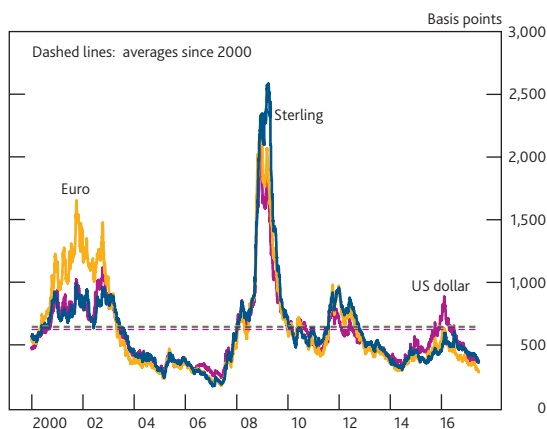


Sources: Barclays Live, BBA, Bloomberg, Chicago Mercantile Exchange, NYSE ICE and Bank calculations.

(a) Three-month implied volatilities for exchange rates, equities and ten-year interest rates.

Chart A.33 Spreads on high-yield corporate bonds are compressed relative to past averages

High-yield corporate bond spreads^(a)



Sources: Bank of America Merrill Lynch Global Research and Bank calculations.

(a) Option-adjusted spreads. The US dollar series refers to US dollar-denominated bonds issued in the US domestic market, while the sterling and euro series refer to bonds issued in domestic or eurobond markets in the respective currencies.

These very low levels of market volatility could be supported by improvements in the near-term economic outlook, and expectations that the pace of monetary policy normalisation, which is already under way in the United States, will be gradual. Increased use by investors of strategies that sell insurance against a rise in volatility, for which they get paid a premium, may have further contributed to the most recent reduction in measures of volatility.

The low volatility environment could incentivise behaviour that leads to risk-taking and higher leverage, which would build up risks and fragilities in the financial system.

...and some asset valuations appear inconsistent with the pessimistic and uncertain outlook embodied in long-term market interest rates.

In corporate bond markets, returns appear low relative to the risk borne by investors, offering little compensation for downside risks. For example, corporate bond spreads are compressed, most notably in the riskier high-yield sector (**Chart A.33**). In the United States, this compression in spreads has been accompanied by elevated levels of corporate leverage. Non-price terms for corporate borrowing have also eased: in both Europe and the United States, the share of leveraged lending deals with weaker covenants — where investors accept fewer safeguards in the event of a deterioration in the debtor company's finances — has increased to over 70% in the first five months of 2017, from less than 5% in 2010.

In the United Kingdom, real interest rates have fallen further, which does not appear to be reflected in some risky asset prices...

In the United Kingdom, long-term risk-free real interest rates have fallen by 26 basis points since the previous *Report*, compared with a smaller fall in euro-area rates, and broadly unchanged US real rates (**Chart A.34**). These developments suggest investors may be factoring in a higher probability of an adverse outcome for the UK economy.

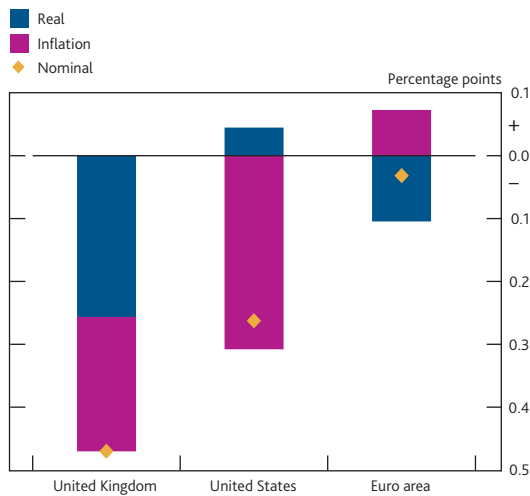
That probability of an adverse outcome does not, however, appear to be reflected in some risky asset prices. Spreads on sterling investment-grade corporate bonds, for example, are compressed relative to historical averages and high-yield spreads are close to post-crisis lows.

...including in the UK commercial real estate market...

Valuations in some segments of the UK commercial real estate (CRE) sector also continue to appear stretched. Aggregate prices rose by 0.9% on the quarter in 2017 Q1, leaving them broadly flat on a year earlier, despite a sharp fall in the quarter following the UK referendum on EU membership. CRE rental yields remain low by historical standards, suggesting that future rental income expectations embody growth prospects

Chart A.34 The causes of changes in nominal government bond yields differ across economies

Changes in nominal ten-year interest rates since the November Report^{(a)(b)}

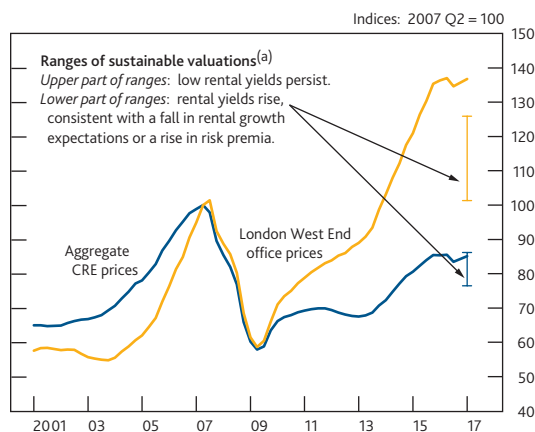


Sources: Bloomberg and Bank calculations.

- (a) Zero-coupon rates derived from government bonds. The contribution of real rates and implied inflation to the change in nominal rates is calculated using inflation swaps, which reference RPI for the United Kingdom, CPI for the United States and HICP for the euro area.
 (b) Shows changes in interest rates between 18 November 2016 and 16 June 2017.

Chart A.35 UK commercial real estate prices look stretched based on ranges of sustainable valuations

Commercial real estate prices in the United Kingdom and ranges of sustainable valuations



Sources: Bloomberg, Investment Property Forum, MSCI Inc. and Bank calculations.

- (a) Sustainable valuations are estimated using an investment valuation approach and are based on an assumption that property is held for five years. The sustainable value of a property is the sum of discounted rental and sale proceeds. The rental proceeds are discounted using a 5-year gilt yield plus a risk premium, and the sale proceeds are discounted using a 20-year, 5-year forward gilt yield plus a risk premium. Expected rental value at the time of sale is based on Investment Property Forum Consensus forecasts. The range of sustainable valuations represents varying assumptions about the rental yield at the time of sale: either rental yields remain at their current levels (at the upper end), or rental yields revert to their 15-year historical average (at the lower end). For more details, see Crosby, N and Hughes, C (2011), 'The basis of valuations for secured commercial property lending in the UK', *Journal of European Real Estate Research*, Vol. 4, No. 3, pages 225–42.

that are inconsistent with those embodied in the low risk-free rates by which they are being discounted.

... which is therefore vulnerable to repricing.

A range of sustainable valuations in the CRE market can be generated using a valuation model based on a number of assumptions, including about CRE rental yields.

Based on this approach, current prices lie at the top end of the range of sustainable valuations (the blue range in **Chart A.35**), which is consistent with persistently low rental yields.

Were rental yields to return to their historical averages, this would suggest that current prices are above estimated sustainable valuation levels (the lower bound of the blue range in **Chart A.35**). This would be consistent with either an increase in long-term risk-free interest rates or an adjustment of risk premia and medium-term rental growth expectations, or both.

Some segments of the CRE market appear more stretched than the aggregate picture. For example, current London West End office prices are well above the range of estimated sustainable valuation levels (the orange range in **Chart A.35**). Consensus forecasts from the Investment Property Forum, published in March, point to average price falls of around 0.7% for aggregate UK CRE and 6.0% for London West End offices by end-2018.

An adjustment in asset prices could be amplified by the behaviour of some investors, which would affect the supply of credit to the real economy.

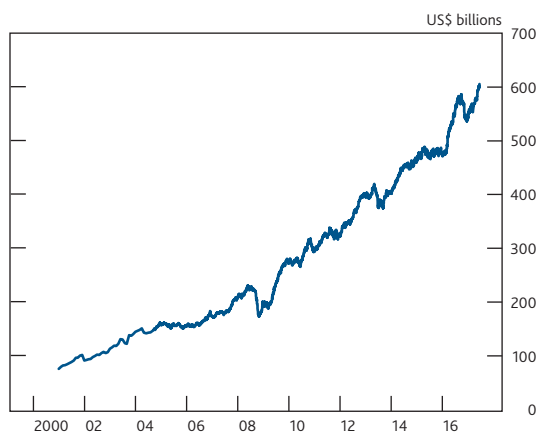
Any adjustment in asset prices could be amplified, given reduced liquidity in some markets, particularly if some investors behave procyclically — that is, if they sell risky assets in large quantities purely in response to a reduction in the performance of their portfolios. A range of assets, including UK CRE, are held in open-ended investment funds, some of which allow investors to redeem their investments on a daily basis. The structure of these funds could create incentives for investors to redeem ahead of others, for example if investors remaining in a fund were to bear some of the costs of meeting redemptions.⁽¹⁾ This could test market liquidity (see **Market-based finance chapter**).

In corporate bond markets, the amount held by open-ended investment funds has increased substantially in recent years, outpacing growth in the global market. Firms have also been issuing longer-term bonds. While this locks in financing for a longer period of time, it can mean that bondholders are exposed to larger movements in prices in the event of a sharp rise in interest rates. In addition, at low interest rates, the

(1) For further discussion see pages 23–25 of the December 2015 *Financial Stability Report*; www.bankofengland.co.uk/publications/Documents/fsr/2015/dec.pdf.

Chart A.36 Interest rate risk related to corporate bond markets has increased

Estimated losses in global corporate bond markets following a 100 basis point increase in interest rates^(a)

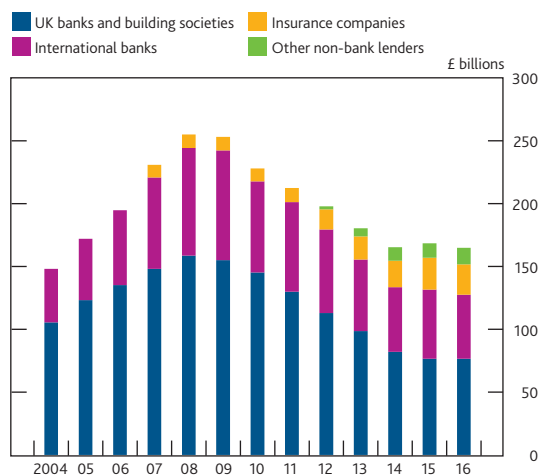


Sources: Barclays Live, Thomson Reuters Datastream and Bank calculations.

(a) The chart is a measure of how aggregate risk exposures to corporate bond markets globally have risen over time. It is calculated based on the Barclays Global Aggregate Corporate Bond Index, which can be used as a representative measure of global investment-grade corporate bond markets. However, the index does not capture all investment-grade corporate bonds. The measure has been inflation-adjusted, with prices indexed to January 2017.

Chart A.37 UK banks' stock of CRE lending has more than halved since the crisis

UK CRE debt reported to De Montfort University survey^(a)



Sources: De Montfort University and Bank calculations.

(a) The composition of the survey sample was altered as follows: a category for insurance companies was created in 2007, and another one for non-bank lenders in 2012. The category of insurance companies includes only UK insurers from 2007 to 2011, and all insurers from 2012 onwards. Data exclude commercial mortgage-backed securities.

responsiveness of corporate bond prices to shocks will tend to be higher. Together, these factors mean that the losses that would be incurred given a 100 basis point rise in interest rates in global corporate bond markets, all else equal, have increased markedly over the past few years (Chart A.36). Such higher losses could increase the likelihood of investors exhibiting procyclical behaviour and therefore magnifying price falls.

In the limit, the supply of credit to the real economy, and transfer of risk to those who are best placed to manage it, could be impaired. CRE is widely used as collateral for corporate borrowing. An amplified downturn in the CRE market could be transmitted to the real economy by reducing companies' access to bank loans and their ability to undertake new investment. Research by Bank staff suggests that every 10% fall in UK CRE prices is associated with a 1% decline in economy-wide investment.⁽¹⁾

A sharp fall in asset prices could further adversely impact the balance sheets of banks and other financial institutions at the core of the financial system.

UK banks have more than halved their stock of CRE lending since the crisis (Chart A.37). The total stock of UK banks' CRE lending fell from around £160 billion at end-2008 to around £77 billion at end-2016. For large UK banks involved in the 2017 stress test,⁽²⁾ their exposures to the CRE sector averaged around 50% of common equity Tier 1 capital at end-2016. And the 2016 stress test demonstrated that they have become more resilient to stresses in the CRE market.

The Bank's 2017 annual cyclical stress-test scenario will assess the resilience of the banking system to an increase in volatility, a reduction in market participants' appetite for risk, and falls in asset prices, including a 40% fall in UK CRE prices.

The FPC continues to emphasise the importance of market participants recognising the distribution of risks in different asset classes, managing them prudently, and pricing them accordingly.

(1) Bahaj, S, Foulis, A and Pinter, G (2016), 'The residential collateral channel', *Centre for Macroeconomics Discussion Paper CFM-DP2016-07*.

(2) The figure includes gross on balance sheet exposures as well as committed credit lines, and exposures booked in Jersey and Guernsey. Standard Chartered Bank is excluded, as it has minimal UK CRE exposures.

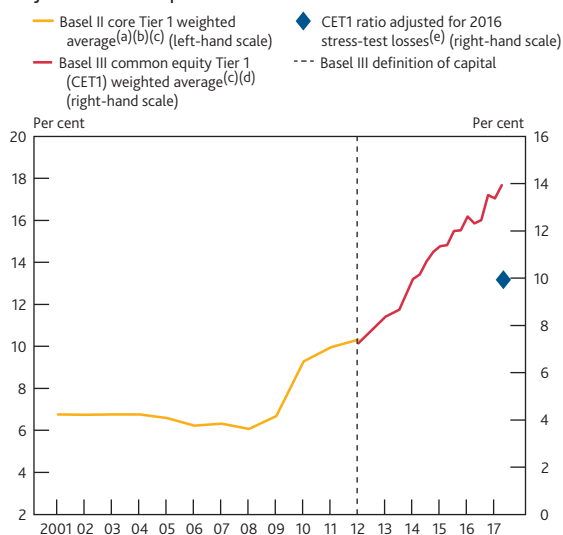
Banking sector resilience

The UK banking system remains resilient. The aggregate Tier 1 capital position of major UK banks was 15.7% of risk-weighted assets in March 2017. The FPC intends to set the minimum leverage requirement for major UK banks at 3.25% of non-reserve exposures, subject to consultation. This is intended to offset the impact of removing central bank reserves from the leverage ratio exposure measure, and restore the original level of resilience delivered by the leverage ratio standard. The United Kingdom is on course to ensure that, by 2022, any remaining barriers to the resolvability of the largest UK banks have been removed, and to implement ring-fencing requirements by 2019. Work is also ongoing to build resilience to cyber risks.

UK banks' funding costs remain low, and equity prices have recovered over the past year. However, price to book ratios remain low, reflecting continued headwinds from misconduct costs and low investment banking returns. Weak profitability diminishes banks' future ability to rebuild capital following a shock that incurs losses. The exploratory scenario in the 2017 stress test will consider how the resilience of the UK banking system might evolve if recent headwinds to bank profitability persist and intensify.

Chart B.1 Major UK banks have continued to strengthen their capital positions

Major UK banks' capital ratios



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

- Major UK banks' core Tier 1 capital as a percentage of their risk-weighted assets. Major UK banks are Banco Santander, Bank of Ireland, Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, National Australia Bank, Nationwide, RBS and Virgin Money. Data exclude Northern Rock/Virgin Money from 2008.
- Between 2008 and 2011, 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 *Report*.
- Weighted by risk-weighted assets.
- From 2012, the 'Basel III common equity Tier 1 capital ratio' is calculated as common equity Tier 1 capital over risk-weighted assets, according to the CRD IV definition as implemented in the United Kingdom. The Basel III peer group includes Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK.
- CET1 ratio less the aggregate percentage point fall projected under the Bank of England's 2016 annual cyclical stress scenario for the six largest UK banks.

The UK banking system remains resilient.

UK banks have continued to strengthen their capital positions. In aggregate, the major UK banks had a common equity Tier 1 (CET1) ratio of 13.9% of risk-weighted assets in March 2017 (**Chart B.1**), and a total Tier 1 capital ratio of 15.7%. This CET1 ratio is 40 basis points higher than at the time of the November 2016 *Report*, when the FPC judged that, as a consequence of the 2016 stress test, the UK banking system was, in aggregate, capitalised to support the real economy in a severe macroeconomic stress. On a non risk-weighted basis, the major UK banks' aggregate leverage ratio was 5.3% of total exposures in March 2017, compared with total requirements and buffers of 3.3% (**Chart B.2**).

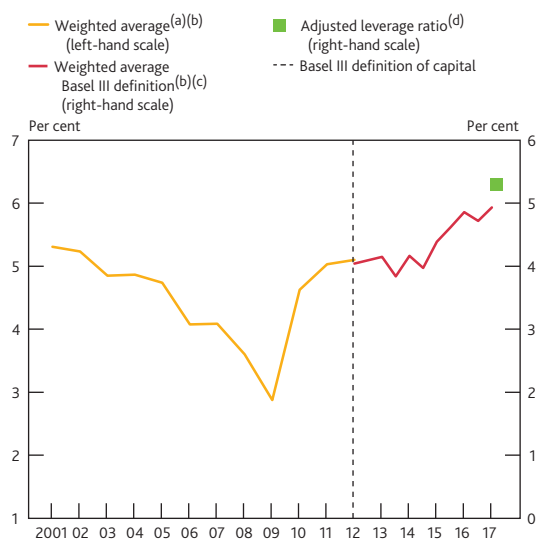
UK banks' liquidity and funding positions are also robust. For major UK banks, the aggregate ratio of liquid assets to potential net outflows under stressed conditions (known as the Liquidity Coverage Ratio) was 128% in March 2017. And all major UK banks have sufficient stable funding to meet the proposed Net Stable Funding Ratio (NSFR) requirement.⁽¹⁾

Since 2014, the FPC has been contributing to the Bank's annual review of the Sterling Monetary Framework (SMF), with members giving views on whether the SMF's liquidity insurance facilities remained fit for purpose from a

(1) The implementation date for the NSFR in the European Union is still to be confirmed.

Chart B.2 Leverage ratios have strengthened

Major UK banks' leverage ratios



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

- (a) Prior to 2012, data 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). The peer group used in Chart B.1 also applies here.
- (b) Weighted by total exposures.
- (c) The Basel III leverage ratio corresponds to aggregate peer group Tier 1 capital over aggregate leverage ratio exposure. Up to 2013, Tier 1 capital includes grandfathered capital instruments and the exposure measure is based on the Basel 2010 definition. From 2014 H1, Tier 1 capital excludes grandfathered capital instruments and the exposure measure is based on the Basel 2014 definition. The Basel III peer group used in Chart B.1 also applies here.
- (d) Estimated leverage ratio for the major UK banks excluding central bank reserves from the exposure measure. Data are 2017 Q1 for all firms except Co-operative Banking Group (2016 Q4).

macroprudential perspective. As part of the Bank's 2017 review, at its March meeting the FPC reviewed developments in the SMF over the previous year. These included the additional indexed long-term repo operations that the Bank had announced prior to the EU referendum, and the increased number of SMF participants over the course of the year. In the FPC's view, and given developments in the SMF since the Bank's 2016 review, the SMF remained fit for purpose from a macroprudential perspective. The Bank's 2017 annual review of the SMF will be published alongside the Bank's forthcoming *Annual Report*.⁽¹⁾

Consistent with its previous commitment, the FPC is restoring the level of resilience delivered by its leverage ratio standard...

In July 2016, the FPC excluded central bank reserves from the measure of banks' exposures used to assess their leverage. This change reflected the special nature of central bank reserves and was designed to avoid a situation in which the Committee's leverage standards impeded the transmission of monetary policy. The FPC committed last year that it would make an offsetting adjustment to ensure that the amount of capital needed to meet the UK leverage ratio standard would not decline. The FPC did not intend for there to be a permanent loosening of the standard. At its June 2017 meeting, the FPC therefore agreed to consult on a draft Recommendation to the PRA that it amend its rules on the leverage ratio to:

- (i) exclude from the calculation of the total exposure measure those assets constituting claims on central banks, where they are matched by deposits accepted by the firm that are denominated in the same currency and of identical or longer maturity; and
- (ii) require a minimum leverage ratio of 3.25%.

By raising the minimum leverage standard from 3% to 3.25% on the revised exposure measure, the FPC intends to ensure that the original level of resilience is restored, while also preserving the benefits of excluding central bank reserves from the exposure measure. The FPC and PRA consultations on these proposals will run from 27 June to 12 September 2017.

The Committee will further consider the impact of changes to international standards on the calibration of the UK capital and leverage framework. These changes include:

- the finalisation of Basel III; and
- the implementation of IFRS 9, due to come into effect in 2018.

(1) A 'Concordat' between the FPC and the Bank's Executive, describing the role of the FPC in relation to the SMF, was first published in 2013. At its 2017 Q2 meeting, the FPC agreed a small number of updates to the Concordat, designed to clarify the FPC's involvement in SMF decision-making. The MPC SMF Concordat is being updated in parallel. The updated concordats will replace the 2013 versions published on the Bank's website.

...and the United Kingdom is on course to ensure that, by 2022, any remaining barriers to the resolvability of the largest UK banks have been removed...

A core element of global regulatory reform has been ensuring that banks can fail safely, without interrupting the provision of financial services or requiring publicly funded bailouts. Significant progress has been made to remove barriers to resolvability but there is still more to do. The United Kingdom now has a comprehensive and effective bank resolution regime, under which the Bank has a wide toolkit, including the power to 'bail in' the shareholders and creditors of failed banks. This requires banks to maintain a minimum amount of loss-absorbing resources known as 'minimum requirements for own funds and eligible liabilities' (MREL). In May 2017, the Bank published estimates of the amount of MREL that the largest UK banks and building societies will be required to maintain when requirements are implemented in full in 2022.⁽¹⁾

Based on these indicative estimates, the largest UK banks will be required by 2022 to have aggregate loss-absorbing resources of 28% of risk-weighted assets on average.⁽²⁾ Around half of this will be in the form of Tier 1 capital that can absorb losses before resolution. Large UK banks have issued around £70 billion of senior unsecured holding company debt over the past two years, which can readily be bailed in. The Bank estimates that these banks will need to issue around an additional £150 billion of MREL-eligible instruments to meet the indicative 2022 requirements.⁽³⁾ With a view to further increasing transparency about the resolvability of firms, the Bank intends to provide summaries of major UK banks' resolution plans and its assessment of their effectiveness, including any further steps that need to be taken, by 2019.⁽⁴⁾

...while firms are on track to implement their ring-fencing plans by 2019.

The largest UK banks are in the process of separating their core retail banking activities into 'ring-fenced banks' (RFBs), with investment and international banking activities situated outside the ring-fence. Ring-fencing will deliver significant financial stability benefits, by protecting core retail banking activities from risks associated with activities such as investment banking, and by enhancing the resolvability of large banking groups.

(1) Refers to the four UK global systemically important banks (G-SIBs) — Barclays, HSBC, RBS and Standard Chartered — plus Lloyds Banking Group, Nationwide and Santander UK.

(2) This includes Basel III capital buffers, and assumes a 1% countercyclical capital buffer.

(3) As a firm's MREL will depend upon its going concern requirements in a particular year, the 2022 MRELS are simply indicative and are based on the calibration methodology set out in the Bank's Statement of Policy, with reference to the firms' minimum capital requirements and balance sheets as at December 2016.

(4) For more details on the UK bank resolution framework, see the Bank's response to the Treasury Committee's inquiry into capital, available at data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/treasury-committee/capital-and-resolution/written/69208.pdf.

Table B.1 Funding costs have fallenSelected measures of UK banks' funding costs^{(a)(b)}

	Pre-crisis (1 Jan. 2007)	Global financial crisis	July 2016 Report	Nov. 2016 Report	Latest
Additional Tier 1 ^(c)	–	–	737	660	350
Covered bond ^(d)	-24	218	11	3	-1
Senior unsecured bond ^(e)	–	368	96	59	42
Senior CDS ^(f)	5	222	134	97	56

Sources: Bloomberg, Markit Group Limited and Bank calculations.

(a) UK banks are Barclays, HSBC, Lloyds Banking Group and RBS.

(b) Funding spreads are measured in basis points.

(c) Simple average of secondary market spreads over government bonds.

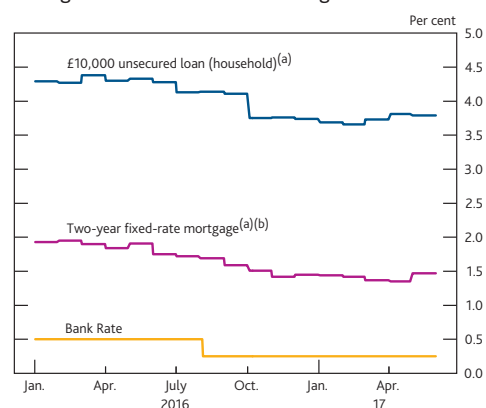
(d) Constant-maturity simple average of secondary market spreads to swaps for five-year euro-denominated covered bonds or a suitable proxy.

(e) Constant-maturity simple average of secondary market spreads to mid-swaps for five-year euro-denominated senior unsecured bonds, or a suitable proxy when unavailable.

(f) Simple average of five-year senior CDS premia.

Chart B.3 Quoted rates on new real-economy lending have fallen broadly in line with Bank Rate

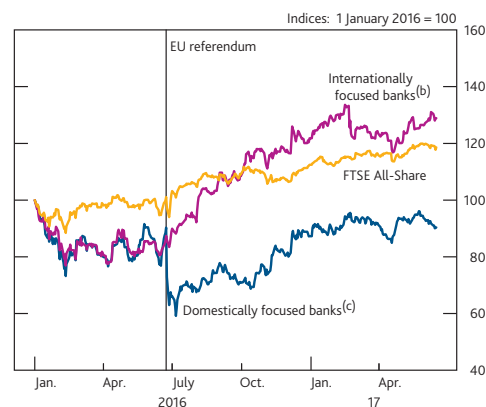
Average interest rates on new lending and Bank Rate



Sources: Bank of England and Bank calculations.

(a) Sterling-only end-month quoted rates.

(b) On mortgages with a loan to value ratio of 75%.

Chart B.4 Share prices have recovered since their mid-2016 lowsUK banks' share prices and FTSE All-Share index since 1 January 2016^(a)

Sources: Thomson Reuters Datastream and Bank calculations.

(a) Bank indices use weighted averages by market capitalisation.

(b) International banks: HSBC and Standard Chartered.

(c) UK domestic banks: Barclays, Lloyds Banking Group and RBS.

All relevant firms are already implementing their plans to meet the statutory deadline of 1 January 2019, though significant further work remains to be done.

Implementation of ring-fencing carries operational risks. Firms will need to ensure customers are served, and products and services provided, from separate legal entities. This will involve some major reorganisations and transfers, including moving a large number of customers to new sort codes over the next year. Some IT systems will be separated and direct access will need to be established for RFBs to financial infrastructure, such as clearing and payment systems. Firms have plans in place to mitigate the risk of disruption to essential financial services during this process, and the PRA is monitoring the implementation of ring-fencing closely.

Work is also ongoing to build cyber resilience.

Cyber attacks pose a serious threat to the resilience of the UK financial system. At its June 2017 meeting, the FPC reviewed progress by the UK authorities and financial sector in building cyber resilience, and decided to withdraw its June 2015 Recommendation on CBEST vulnerability testing. The FPC has also set out its approach to assessing cyber resilience in the future. These assessments are set out in Box 7.

Market indicators support a view that UK banks are resilient...

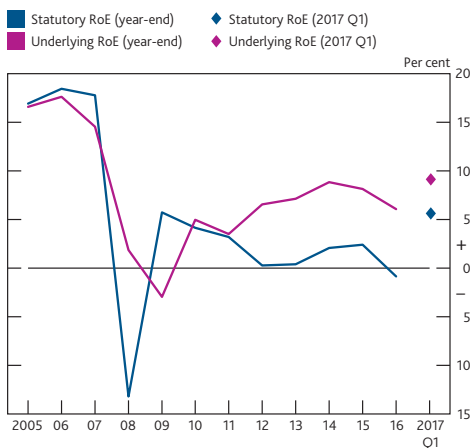
Reflecting the overall resilience of the UK banking sector, bank funding costs have remained low since the November Report (Table B.1). Credit default swap (CDS) premia, which measure the cost of insuring against bank default, are now close to post-crisis lows, at just under 60 basis points. And spreads on additional Tier 1 (AT1) instruments — bonds that convert to equity if a bank's capital ratio falls below a certain level — are at their lowest level on record. The market for European (including UK) banks' AT1 instruments has made a strong recovery following turbulence in February 2016; market contacts attribute this to an improving economic environment, a perceived fall in European political risks and changes in the regulatory treatment of AT1 in Europe.

...and the Bank's Term Funding Scheme has helped to ensure lending rates have fallen in line with Bank Rate since July 2016...

In August 2016, the Monetary Policy Committee (MPC) cut Bank Rate to 0.25%, and launched a Term Funding Scheme (TFS) to provide funding for banks at interest rates close to Bank Rate. The TFS was intended to reinforce the transmission of the cut in Bank Rate to the real economy. In addition, the TFS provides participants with a cost-effective source of funding to support additional lending to the real economy, insuring against the risk that conditions tighten in bank funding markets.

Chart B.5 Bank profitability remains weak

UK banks' statutory and underlying return on equity^{(a)(b)(c)(d)}



Sources: Published accounts and Bank calculations.

- (a) Weighted average by shareholders' equity.
 (b) Statutory return on equity (RoE) is defined as net income attributable to shareholders divided by average shareholders' equity. Underlying RoE strips out misconduct costs as well as one-time charges such as restructuring costs.
 (c) UK banks are Barclays, HSBC, Lloyds Banking Group and RBS.
 (d) 2017 Q1 results are annualised and may display seasonality. They are not directly comparable to full-year results.

Chart B.6 Price to book ratios have improved but remain below one

UK banks' average price to book ratio^{(a)(b)(c)}

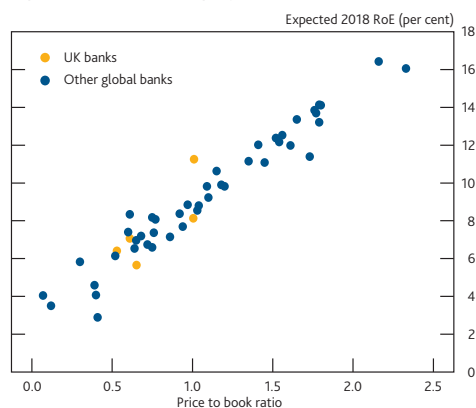


Sources: Thomson Reuters Datastream and Bank calculations.

- (a) UK banks are Barclays, HSBC, Lloyds Banking Group and RBS.
 (b) Relates the share price with the book, or accounting, value of shareholders' equity per share.
 (c) HSBC price to book ratio adjusted for currency movements.

Chart B.7 Price to book ratios are broadly in line with expected return on equity

Price to book ratios for major global banks compared with expected returns on equity



Sources: Bloomberg, Thomson Reuters Datastream and Bank calculations.

When the TFS was launched, the MPC stated that the value of funding provided by the TFS would be determined by usage of the scheme. As of June 2017, aggregate outstanding TFS drawings by UK banks and building societies were £65 billion. As set out in the Bank's 2017 Q1 *Credit Conditions Review*, most major UK lenders reported that the TFS had contributed to recent falls in bank funding spreads. As a result, since the TFS was introduced, quoted rates on new real-economy lending have, overall, fallen broadly in line with the reduction in Bank Rate as intended (**Chart B.3**).

...but low profitability may pose a risk to resilience in future.

UK banks' equity prices have recovered from their mid-2016 lows (**Chart B.4**). While aggregate return on equity for the largest UK banks was just below zero in 2016, 'underlying' returns, which strip out misconduct costs and one-time charges such as restructuring costs, remained positive, at around 6%. 2017 Q1 results showed material improvement in profits, driven by a partial recovery in investment banking returns (**Chart B.5**).

Price to book ratios, which measure the market value of equity relative to the value of equity recorded on banks' balance sheets, remain persistently below one (**Chart B.6**). The FPC continues to judge that the low equity prices of UK banks can likely be explained by anticipated misconduct redress costs and weak expected operating profitability of investment banking services in particular, rather than by market concerns about asset quality. For major global banks generally, the correlation between price to book ratios and expected returns on equity is currently above 90% (**Chart B.7**), and much higher than the correlation between price to book ratios and measures of asset quality. This means that low price to book ratios for UK banks do not signify that their ability to absorb losses is diminished.

Weak profitability does affect banks' future ability to rebuild capital following any shock that results in losses while also maintaining credit supply. The exploratory scenario in the 2017 stress test will consider how the resilience of the UK banking system might evolve if recent headwinds to bank profitability persist and intensify. The purpose of this scenario is to explore the impact of banks' actions on both the real economy and the future resilience of the system to shocks. The aggregate results of the test will be published in November 2017.⁽¹⁾

(1) The Bank does not intend to publish individual bank results under the exploratory scenario, based on considerations around the possible commercial sensitivity of the projections banks will provide.

Box 7 Building cyber resilience in the UK financial system

Cyber attacks pose a threat to the stability of the provision of UK financial services. There has been a growing number of high-profile cyber incidents in recent years, some of which have involved financial sector firms. These incidents highlight the importance of firms developing capabilities to protect against, respond to and recover from cyber attacks.

Progress made towards building cyber resilience in the financial system

Since 2013, the FPC has made two Recommendations to regulators regarding cyber resilience (Table 1). This box describes how these Recommendations have been implemented, and sets out the FPC's future approach.

Table 1 The FPC's Recommendations on cyber resilience

In June 2013, the FPC recommended that:

'HM Treasury, working with the relevant government agencies, the PRA, the Bank's financial market infrastructure supervisors and the FCA should work with the core UK financial system and its infrastructure to put in place a programme of work to improve and test resilience to cyber attack.'

In July 2015, the June 2013 Recommendation was replaced with the following Recommendation:

'The FPC recommends that the Bank, the PRA and the FCA work with firms at the core of the UK financial system to ensure that they complete CBEST tests and adopt individual cyber resilience action plans. The Bank, the PRA and the FCA should also establish arrangements for CBEST tests to become one component of regular cyber resilience assessment within the UK financial system.'

Source: Bank of England.

Since the 2013 Recommendation, the organisation of authorities who have a role in strengthening the resilience of the financial system to cyber risks has been improved.

The National Cyber Security Centre (NCSC) has been established as the main technical authority for UK cyber security in order to share knowledge and address systemic vulnerabilities. UK financial authorities, together with the NCSC and the industry, have since improved information sharing across the financial sector.

A response framework allows the UK authorities to co-ordinate their response to cyber attacks that have affected, or have the potential to affect, the financial sector. It now includes the NCSC and, if appropriate, the National Crime Agency.

At the international level, the G7 Cyber Expert Group has published guidance on cyber security for the financial sector.⁽¹⁾

The group is now developing guidance for effective cyber security assessment; identifying and treating cyber risk arising from third parties; and co-ordinating with other critical sectors such as telecommunications and energy.

The FPC's Recommendations have catalysed testing of the resilience of core financial companies to cyber attack.

The 2015 FPC Recommendation called for financial services firms and financial market infrastructures at the core of the UK financial system ('core firms') to complete so-called CBEST tests. These tests subject firms to simulated cyber attacks, and are tailored to each firm, drawing on government, intelligence agency and private sector expertise. Since 2014, 31 out of 34 firms have finished testing, and two further firms are close to completion. This includes banks representing more than 80% of the outstanding stock of PRA-regulated banks' lending to the UK real economy. The first round of CBEST testing is therefore materially complete.

The results of testing, together with the actions taken to address weaknesses, demonstrate that core firms have made significant progress in building cyber resilience.

The first round of tests served its intended purpose by identifying weaknesses in core firms' cyber resilience. For obvious security reasons, these results will not be detailed. But where shortcomings were identified, firms are implementing action plans to remedy the issues, overseen by supervisors. In some cases, controls on the integrity of systems and confidentiality of data needed to be strengthened. In others, the tests identified the need for further investment in capabilities to detect, mitigate and respond to attacks. And in general, the tests highlighted the importance of firms continuing to invest in their people, processes and technology in order to counter the risks of cyber attack.

Consistent with the FPC's Recommendation, CBEST will become a regular component of supervisory assessment of firms. Core firms will be expected to conduct their own regular tests of cyber resilience. They will also be subject to supervisor-led CBEST testing at regular intervals. The frequency of these tests will be proportionate to firms' importance for financial stability. CBEST is also being adopted in other jurisdictions and sectors.

Based on the progress made, the FPC judges that its 2015 Recommendation has been implemented, and that it is appropriate to withdraw its Recommendation.

(1) 'G7 fundamental elements for cyber security', October 2016, www.gov.uk/government/publications/g7-fundamental-elements-for-cyber-security.

The next phase in building and maintaining resilience

Given the progress made and the lessons from work to date, the FPC is now moving to the next stage.

Its focus is on systemic risk, rather than risk to individual companies or consumers. That is, the risk of cyber attack causing disruption to critical financial services on a scale that causes material disruption to the UK economy.

The FPC is setting out the elements of the framework of regulation for the UK financial system's cyber resilience that are necessary to mitigate systemic risk. The FPC's future role will be to check that each element is being fulfilled by the relevant authorities.

The FPC judges that effective regulation requires:

(1) Clear baseline expectations for firms' resilience that reflect their importance for the financial system.

Working with the Bank, PRA and FCA, the FPC will consider its tolerance for the disruption to important economic functions provided by the financial system. Supervisors will set clear expectations for firms consistent with this tolerance.

(2) Regular testing of resilience by firms and supervisors.

This will build on the first round of CBEST testing and ensure the most systemic firms are subject to regular checks, with the frequency and scope of the tests set in line with supervisory strategy. This will allow supervisors to keep pace with the evolving nature of the risk.

Assessment of the system's resilience will also be informed by sector-wide simulation exercises, which test the industry's response and recovery capabilities. The FPC has asked for regular reports from supervisors on the systemic risks exposed by these regular tests and exercises.

(3) Identification of firms that are outside the financial regulatory perimeter, but which may be important for regulated firms.

Cyber attacks that result in disruption to third-party providers outside the regulatory scope could still have effects on the financial system. The FPC has therefore requested annual updates from the financial authorities, which include HM Treasury, the Bank, PRA and FCA, on the cyber resilience of firms that are outside the regulatory perimeter, but which are important for the UK financial sector.

(4) Clear and tested arrangements to respond to cyber attacks when they occur.

UK authorities co-ordinate their response to cyber attacks that may potentially affect the financial system. The financial authorities regularly test and review these arrangements, in line with evolving threats and experience gained from managing incidents. Co-operation with the industry can also enhance the sector's capacity to respond to threats and share information during an incident.

The FPC has requested an annual update on the effectiveness of the response framework from financial authorities, to check that the system has the capacity to respond to and recover from a cyber attack.

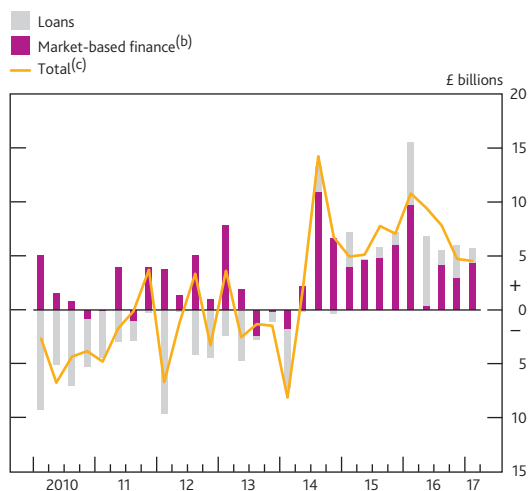
Where the FPC receives reports that demonstrate shortcomings in the regulatory framework, it will consider using its statutory powers to make Recommendations to the relevant authorities that these be remedied.

Market-based finance

Market-based finance accounts for almost half of the UK financial system's total assets, and supports the provision of financial services to the real economy. The provision of market-based finance relies on core financial intermediaries, such as dealers, which remain resilient. But there is evidence that conditions in some markets, such as the repo market, have declined in recent years, as dealers are less willing to act as intermediaries. High demand for market liquidity in stresses, including from open-ended funds, also remains a risk. Life insurance companies, meanwhile, continue to support market-based finance through increased holdings of illiquid assets.

Chart B.8 Market-based finance is an important source of financing for UK companies

Net finance raised by UK private non-financial corporations (PNFCs)^(a)



Sources: Bank of England and Bank calculations.

- (a) Finance raised by PNFCs from UK MFIs and from capital markets. Data cover funds raised in both sterling and foreign currency, converted to sterling. Seasonally adjusted. Bonds and commercial paper are not seasonally adjusted.
 (b) Market-based finance is composed of bonds, equities and commercial paper.
 (c) Owing to the seasonal adjustment methodology, the total series may not equal the sum of its components.

Market-based finance is an increasingly important source of financing for the UK real economy.

The importance of market-based finance as a means of providing finance to the real economy has grown over the past few years. Non-bank financial institutions represent key sources of market-based finance and account for almost half of the UK financial system's total assets, up by 10 percentage points since 2009. These institutions provide financial services to the real economy, including by investing in capital markets, such as equity and corporate bond markets (**Chart B.8**).

On a cumulative basis, capital markets account for almost all net finance raised by UK private non-financial corporations (PNFCs) since the global financial crisis, primarily in the form of bond issuance. In 2017 to date, sterling investment-grade issuance by UK companies has been broadly in line with its 2010–16 average.

In April, the Bank completed its purchase of £10 billion of investment-grade corporate bonds under the Corporate Bond Purchase Scheme (CBPS), announced as part of the Monetary Policy Committee's policy package in August 2016.

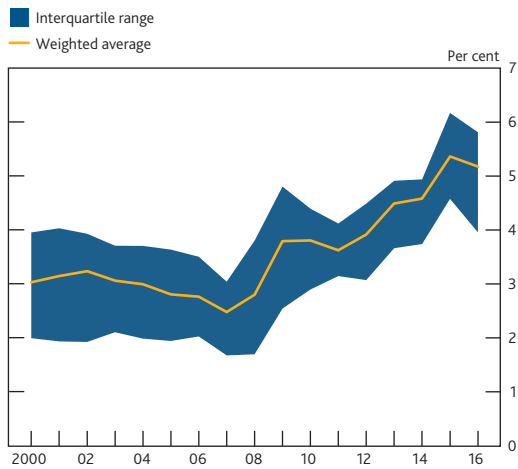
Due to its importance for the UK real economy, the FPC has established a medium-term priority of completing post-crisis reforms to market-based finance in the United Kingdom, and improving the assessment of systemic risks across the financial system (see The FPC's medium-term priorities chapter).

The provision of market-based finance relies on core financial intermediaries, such as dealers, which remain resilient...

Some financial markets, such as cash fixed-income markets, rely on dealers to intermediate between clients, including by building and releasing inventories as part of their market-making activity. Measures of dealer resilience remain

Chart B.9 Aggregate dealer leverage ratios have remained high in the second half of 2016

Dealers' leverage ratios^{(a)(b)}



Sources: Banks' published accounts, SNL Financial, The Banker Database and Bank calculations.

- (a) Leverage ratio defined as reported Tier 1 capital (or common equity where not available) divided by total assets, adjusted for accounting differences on a best-endeavours basis. This accounting measure differs from regulatory leverage ratios.
- (b) Dealers included are Bank of America Merrill Lynch, Barclays, BNP Paribas, Citigroup, Credit Agricole, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Mitsubishi UFJ, Morgan Stanley, RBS, Société Générale and UBS. Pre-crisis data also include Bear Stearns, Lehman Brothers and Merrill Lynch.

robust. The aggregate leverage ratio of the world's largest dealers was 5.2% at end-December (**Chart B.9**). Since the November 2016 *Report*, market perceptions of UK dealers' credit risk, as measured by the cost of default protection (CDS premia), have decreased.

... while reforms to over-the-counter (OTC) derivatives markets are ongoing.

Through OTC derivatives markets, dealers and other financial institutions are exposed to counterparty credit risk related to clients, one another and — for those markets that are cleared — central counterparties (CCPs). In March 2017 new rules were introduced to implement international requirements for the margining of non-cleared OTC derivatives, which aim to improve the mitigation of counterparty credit risk in those transactions. These rules are one element of the G20 reforms to derivatives markets agreed in 2009. In November 2016, the FPC asked the Bank to conduct an in-depth assessment to examine progress towards the implementation of the post-crisis reforms in derivatives markets and the implications for the resilience of the financial system. This assessment continues to feed into broader work by the Financial Stability Board (FSB).

But there is evidence that conditions in some markets, such as the repo market, have declined over recent years, where dealers are less willing to act as intermediaries.

Market liquidity refers to the ability of investors to buy and sell assets in reasonable size, and within a reasonable time frame, without having a large impact on prevailing prices. When market liquidity is reliable, it encourages participation in financial markets, by providing confidence both for issuers (who want to be able to borrow when required at competitive terms) and for investors (who want to be able to move smoothly in and out of positions).⁽¹⁾ The provision of market-based finance is more likely to be stable when financial markets are liquid and function smoothly. The resilience of market liquidity remains uneven across markets.

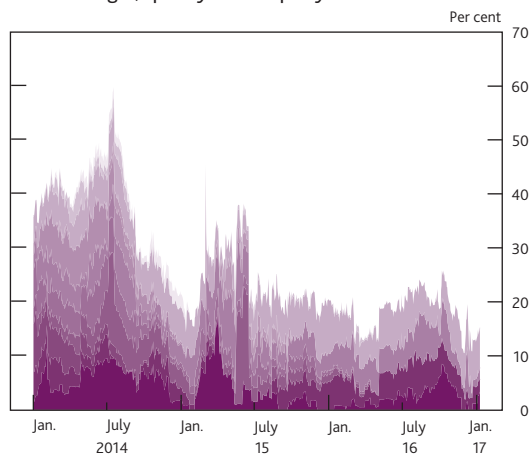
Repo markets contribute to effective market functioning by enabling market makers, such as dealers, to finance their inventories, and leveraged investors, such as hedge funds, to transact in securities, thus supporting market liquidity. The July 2016 *Report* noted that there has been a decline in the availability of, and increase in the cost of, repo financing in some jurisdictions. This is consistent with findings from a cross-jurisdiction study of developments in repo markets conducted by the Committee on the Global Financial System (CGFS), published in April 2017.⁽²⁾

(1) Fair and Effective Markets Review, Final Report, June 2015; www.bankofengland.co.uk/publications/Pages/news/2015/055.aspx.

(2) www.bis.org/publ/cgfs59.htm.

Chart B.10 Dealers, who act as counterparties in repo trades, appear to be less willing to offer repo facilities

Proportion of cash balance placed in repo of a major European asset manager, split by counterparty^(a)

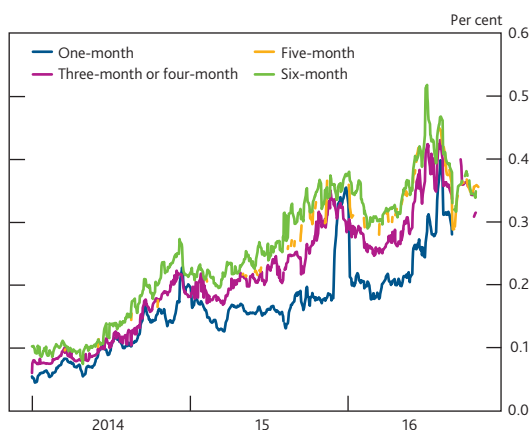


Source: A European asset manager.

(a) Each colour represents one repo counterparty, with eleven in total.

Chart B.11 For UK pension funds, the cost of borrowing cash through repo has increased fourfold since 2014

Gilt repo rates paid by a group of pension fund asset managers in excess of expectations of policy interest rates^(a)

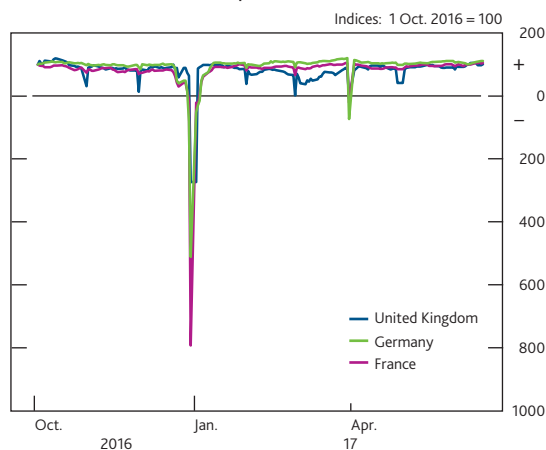


Source: Bloomberg, data collected from a number of asset managers and Bank calculations.

(a) As implied by overnight index swap for the relevant term.

Chart B.12 Overnight repo rates in Europe showed year-end volatility

UK, French and German repo rates



Sources: Bloomberg and Bank calculations.

The CGFS report noted that in some jurisdictions there is evidence of dealers being less willing or able to undertake repo market intermediation in recent years. In some cases, this has led to other financial institutions finding it difficult to place cash. One example cited is that only four of the eleven counterparties that had offered repo facilities to a major European asset manager in 2014 were still willing to do so in 2016 (Chart B.10). The CGFS report also provides evidence of increased costs faced by end-users borrowing in the repo market; for example, repo rates (relative to expectations of policy interest rates) paid by pension funds to borrow cash in the UK gilt repo market increased around fourfold between 2014 and 2016 (Chart B.11). At the same time, the report notes that the rate at which end-users place cash in repo has remained broadly constant since late 2014.

One indicator of reduced repo market liquidity is the volatility in repo rates that has started to occur around reporting dates as dealers reduce their repo activity (Chart B.12). Dislocations in European government bond repo markets at end-2016 were particularly acute, with gilt repo rates falling to -0.5%, the lowest level reached in the past decade. The fall in rates at the end of 2017 Q1 was more muted, which market contacts attribute in part to participants improving their preparations following the challenging year-end.

The CGFS report identifies several drivers behind these changes in repo market conditions. One driver has been changes in the economic environment, such as those driven by central banks. Exceptional monetary policy measures reduce the demand for central bank reserves to meet daily liquidity needs while increasing the supply, including through asset purchases, of those reserves. Changes in the regulatory environment have also played a role — particularly those that act on the size, as well as the composition, of banks' balance sheets, such as the introduction of leverage ratio requirements. In this context, the FPC will consider the impact of changes to international standards on the calibration of the UK capital and leverage framework (see Banking sector resilience chapter).

High demand for market liquidity, including from open-ended funds invested in less liquid assets, remains a risk.

The functioning of some markets could be tested by high demand for liquidity, including from open-ended investment funds. These funds offer short-term redemptions to investors while investing in some cases in longer-dated and potentially illiquid assets. Assets under management in such funds increased by 80% between 2008 and 2015.

Large-scale redemptions could result in sales of assets by funds that exceed the ability of dealers and other investors to absorb them, potentially impairing market liquidity. These effects could be amplified if resulting falls in prices lead to

further redemptions by investors. This potential imbalance between the demand for, and supply of, market liquidity could be particularly acute if investor redemptions were accompanied by volatility rising from its current low level, which could lead to a reduction in dealers' market-making capacity.

Following the UK referendum on EU membership, funds invested in UK commercial real estate suffered significant redemptions and some suspensions, with implications for market liquidity (see the November 2016 *Report*). The Financial Conduct Authority (FCA) subsequently published a discussion paper in February 2017 covering all open-ended funds investing in illiquid assets.⁽¹⁾ The paper aims to gather evidence to decide whether changes to the FCA's regulatory approach are needed to enhance market stability and promote competition in the sector, while protecting consumers.

The FSB also finalised in January its policy recommendations to address related structural vulnerabilities from asset management activities.⁽²⁾ The key recommendations are: (i) funds' investment strategies should be consistent with their redemption terms; (ii) authorities should give consideration to system-wide stress testing; and (iii) globally consistent measures of leverage should be developed. The International Organization of Securities Commissions (IOSCO) is currently operationalising the FSB recommendations, and will consult on draft updated liquidity risk management principles.

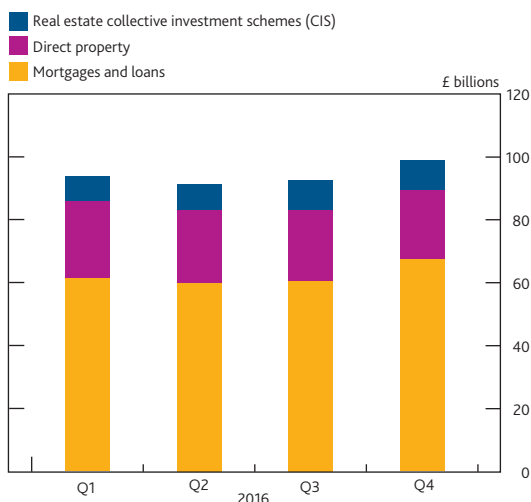
Life insurance companies, meanwhile, continue to support market-based finance through increased holdings of illiquid assets.

Life insurance companies are important investors in financial assets and hence in supporting market-based finance. In the United Kingdom, life insurers hold £1.8 trillion of investment and cash assets and account for a significant proportion of the total assets outstanding in several UK securities markets.

Low market interest rates continue to provide an incentive for life insurers to invest in more illiquid assets such as lower-rated fixed-income securities and real-economy assets, such as equity release mortgages, commercial real estate and infrastructure, in order to earn higher returns. For example, property-related non-linked exposures (ie exposures where insurance firms bear all or part of the market risk on asset holdings) increased from £93 billion in 2016 Q3 to £99 billion in 2016 Q4 (Chart B.13), to stand at 11% of total non-linked assets of UK insurance companies.

Chart B.13 UK life insurers are increasingly investing in illiquid assets^(a)

Stock of property-related non-linked illiquid assets during 2016^(b)



Sources: Solvency II submissions and Bank calculations.

(a) Trend is also driven in part by insurers reclassifying illiquid assets.

(b) Illiquid assets cover: direct property; mortgages and loans; and CIS real estate funds.

(1) www.fca.org.uk/publications/discussion-papers/illiquid-assets-open-ended-investment-funds.

(2) www.fsb.org/2017/01/policy-recommendations-to-address-structural-vulnerabilities-from-asset-management-activities/.

Insurers are further incentivised to invest in illiquid assets to match long-dated stable liabilities, such as annuities; under Solvency II, the 'matching adjustment' allows insurers to look through the impact of short-term market movements on assets when valuing such liabilities.⁽¹⁾ In the November 2016 *Report*, the FPC concluded that the matching adjustment is beneficial from a macroprudential perspective by reducing potential instability across the financial system. UK annuity writers are well-matched between their assets and liabilities versus their European counterparties, as evidenced in the European Insurance and Occupational Pensions Authority (EIOPA) 2016 stress test.

Matching long-dated illiquid liabilities with suitable long-dated illiquid assets can help ensure availability of finance to the wider economy, but can also present risks where firms may not have adequate systems and controls to manage the risks associated with these assets. The PRA issued a consultation on this topic in December 2016.⁽²⁾

The FPC supports ongoing work by the Bank and other authorities to strengthen the regulatory framework for, and oversight of, non-bank financial institutions.

Following efforts by the G20 and the FSB to strengthen the oversight and regulation of the 'shadow banking' system, in April the European Parliament agreed reforms to money market funds, likely to come into force in 2018. The reforms are aimed at making these funds more robust, in order to maintain the essential role that money market funds play in financing the real economy.

The FCA has continued to review the regulatory framework for peer-to-peer platforms in light of the sector's rapid growth and developments in firms' business models. In their interim feedback report on this work, the FCA raised a number of concerns including around information quality, inconsistent disclosures and insufficient wind-down procedures for some firms. The FCA has further set out expectations of firms that operate loan-based crowdfunding platforms that provide loans to businesses. The Bank has also contributed to a CGFS and FSB report on FinTech credit.⁽³⁾ The report concludes that in future FinTech could improve financial stability by providing an alternative source of finance. But it may also give rise to systemic concerns, for example by lowering lending standards, procyclical credit provision, and by posing challenges to the regulatory perimeter. The FPC supports this work and will continue to monitor the sector.

(1) The matching adjustment replaces the so-called 'liquidity premium' under the former Individual Capital Adequacy Standards regime.

(2) 'Solvency II: matching adjustment — illiquid unrated assets and equity release mortgages', *Prudential Regulation Authority Consultation Paper CP48/16*; www.bankofengland.co.uk/pru/Pages/publications/cp/2016/cp4816.aspx.

(3) www.bis.org/publ/cgfs_fsb1.pdf.

Box 8

The UK High-Value Payment System

Electronic payments are essential to the functioning of modern economies. Most electronic payments are made via 'payment systems' in which financial institutions participate to exchange money on behalf of their customers. Each payment system maintains: (a) a set of rules and procedures that govern the transfer of funds between these institutions; and (b) an infrastructure to facilitate those transfers. The largest and most critical payments in the United Kingdom are made over CHAPS, the country's High-Value Payment System (HVPS).

The scale, type and sophistication of potential threats to the stability of payment systems are rising. Risks such as cyber attack are increasingly capable of striking at any part of the payments chain. It is essential that payment systems are able to take an end-to-end view of these risks. Having identified constraints in the existing structure, the Bank decided in April, with the FPC's endorsement, to move to 'direct delivery' of the HVPS. The Bank is now working closely with CHAPS Co, the current operator of the HVPS and with industry to ensure a smooth and timely transition to the new structure this calendar year.

This box explains the rationale for the decision to move to direct delivery. It then places it in the broader context of the Bank's programme for renewal of its Real-Time Gross Settlement (RTGS) infrastructure. The Bank's aim is for this programme to deliver a materially stronger, more resilient, flexible and highly innovative sterling settlement system for the United Kingdom's high-value payments. Moving to direct delivery of the HVPS is a vital part of that vision.

Current delivery of HVPS

The current delivery model for the UK HVPS involves a split in responsibilities across two institutions. The core infrastructure is provided by the Bank, as part of its RTGS system. CHAPS Co, a small private sector company owned by its members is responsible for operating the system's governance and rulebook and managing risks across the HVPS as a whole; CHAPS Co is supervised by the Bank of England. This split is unusual internationally. The norm in most countries is for the central bank to deliver all aspects of the HVPS.

There are structural deficiencies in this model that pose risks to financial stability. The RTGS system has several policy functions, including the implementation of monetary policy. For security reasons therefore CHAPS Co cannot be given the full range of information on, or contractual control over, RTGS that it needs to identify and manage risks across the whole payment system. This includes in important areas of

operational risk such as cyber risk and fraud. The IMF highlighted these constraints in its past two Financial Stability Assessment Programmes on the United Kingdom, most recently in 2016. Such risks are increasingly important and complex. Their potential impact is further amplified as new types of users have sought access to payment systems. At the same time, the tolerance for even short periods of system outage has fallen.

CHAPS Co had made a number of important enhancements to the existing model in recent months to reflect some of these concerns. But these enhancements could not fully address the structural constraints described above. As such, CHAPS Co was unable to fully meet regulatory expectations.

On this basis, the FPC concluded at its 27 April meeting that there were financial stability risks arising from the current structure for delivery of the HVPS, including from the growing threat from cyber attack.

Direct delivery model for HVPS

Under a direct delivery model, the Bank would be responsible for both the operation of the HVPS scheme and the RTGS infrastructure. This would allow the Bank to carry out end-to-end risk management, identifying and responding to emerging risks in the HVPS in a holistic way, using the full range of tools at its disposal. The Bank would maintain its role as the supervisor of the HVPS.

The FPC welcomed the Bank's plan to mitigate the financial stability risks through a move to the proposed direct delivery model for operating the HVPS.

The move towards a direct delivery model is an opportunity for the Bank to provide the FPC with more comprehensive information on the HVPS. This is particularly important given the growing risk environment. The FPC will be given regular reports on the extent of systemic risks arising from the operation of the HVPS. In addition, where the Bank proposes material changes to the delivery of the HVPS in future that affect risks to financial stability, it will consult the FPC.

The Bank has designed a model for the operation and supervision of the HVPS that will involve transparency, user voice and independent challenge. The Bank, CHAPS Co and their stakeholders expect to complete the transition to direct delivery by the end of the calendar year.

The RTGS renewal programme

The move to direct delivery of the HVPS is part of a wider programme to reshape both the infrastructure and governance of the RTGS system. The Bank published a blueprint for the new generation of its RTGS system in May 2017 (Table 1).

Table 1 Service characteristics of the renewed RTGS service

Service characteristic	Objective
Resilience	Strengthen resilience of RTGS and flexibility to respond to emerging threats.
Access	Facilitate greater direct access to central bank money settlement for financial institutions and infrastructures.
Interoperability	Promote harmonisation and convergence with critical domestic and international payment systems.
User functionality	Support emerging user needs in a changing payment environment.
End-to-end risk management	Strengthen capacity to respond to evolving system-wide risks.

Source: 'A blueprint for a new RTGS service for the United Kingdom'; www.bankofengland.co.uk/markets/Documents/paymentsystem/rtgsblueprint.pdf.

The renewed RTGS service will be delivered through a multi-year programme of work. This includes the procurement of a new central infrastructure.

RTGS is vital UK infrastructure. It supports both the UK economy and the Bank's own balance sheet. At the same time the renewal programme is complex, unique and large. It will require co-ordinated changes across the payments industry. It is critical that there are no disruptions to the RTGS service. The Bank has planned accordingly; new features will be introduced in phases. The Bank's current intention is for the majority of new functionality to be live by end-2020.

On 27 April, the FPC met to discuss the current structure for delivering the UK High-Value Payment System (HVPS), in the context of evolving risks to systemically important financial market infrastructure. It agreed that there were financial stability risks arising from the current structure for delivery of the UK HVPS and welcomed the Bank's plan to mitigate these risks through a move to the proposed direct delivery model (see Box 8).

The FPC's medium-term priorities

To help to meet its objectives, alongside its ongoing assessment of the risk environment, the FPC is prioritising three initiatives over the next two to three years:

(1) Finalising, and refining if necessary, post-crisis bank capital and liquidity reforms

Over the past three years, in line with international reforms following the global financial crisis, the FPC has focused on establishing the medium-term capital framework for UK banks and has reviewed the Bank's work to stop banks being 'too big to fail'.

The FPC will now take stock of these reforms and will develop more ways to assess how resilient the banking system would be to shocks. It will:

- Review the judgements underlying its overall calibration of the risk-weighted capital framework for UK banks, including taking into account progress towards ensuring banks are resolvable, changes in accounting standards and reforms to the measurement of risk-weighted assets. The natural point for a full review will be in 2019, in light of the outcome of negotiations to finalise Basel III standards; the FPC has already started reviewing some of these judgements.
- Review the UK leverage ratio framework, in light of progress towards an international standard for a leverage requirement, and its scope of application.
- Take stock of overall liquidity and funding standards for UK banks and consider the case for a time-varying macroprudential liquidity standard.
- Input to the Bank's work to develop its stress tests of the banking system, to capture better the interactions between banks in a stress.

(2) Completing post-crisis reforms to market-based finance in the United Kingdom, and improving the assessment of systemic risks across the financial system

Firms other than banks play an important role in providing finance to the economy and a means of sharing risk. Their

activities can also be a source of systemic risk. Since 2014, the FPC has completed an annual review of risks from, and regulation of, market-based finance, with an in-depth look so far at the activities of open-ended investment funds and insurers, and on changes in market liquidity. The FPC will now:

- Continue its annual review and programme of in-depth reviews on specific market-based finance activities. This will include an assessment of the financial stability risks associated with derivatives transactions, including progress towards implementation of the mandated move to the use of central clearing and other post-crisis reforms.
- Support the Bank's work to develop a system-wide stress simulation, to help understand how the financial system as a whole is likely to respond to shocks.
- Consider whether macroprudential tools for market-based finance might be needed to address systemic risks originating from outside the banking system.

(3) Preparing for the United Kingdom's withdrawal from the European Union

Exit negotiations between the United Kingdom and the European Union have begun. There are a range of possible outcomes for, and paths to, the United Kingdom's withdrawal from the European Union.

The FPC will oversee contingency planning to mitigate risks to financial stability as the withdrawal process evolves.

Irrespective of the particular form of the United Kingdom's future relationship with the European Union, and consistent with its statutory responsibility, the FPC will remain committed to the implementation of robust prudential standards in the UK financial system. This will require a level of resilience to be maintained that is at least as great as that currently planned, which itself exceeds that required by international baseline standards.

Across its priorities, the FPC remains committed to working with relevant authorities domestically and internationally, to protect and enhance the resilience of the UK financial system.

Annex 1: Previous macroprudential policy decisions

This annex lists FPC Recommendations from previous periods that have been implemented since the previous *Report*, as well as Recommendations and Directions that are currently outstanding. It also includes those FPC Policy decisions that have been implemented by rule changes and are therefore still in force.

Each Recommendation or Direction has been given an identifier to ensure consistent referencing over time. For example, the identifier 14/Q2/1 refers to the first Recommendation made at the 2014 Q2 Committee meeting.

Recommendations implemented or withdrawn since the previous *Report*

14/Q2/1	FPC Recommendation on mortgage affordability tests	Superseded by 17/Q2/1 — see below
---------	--	-----------------------------------

When assessing affordability, mortgage lenders should apply an interest rate stress test that assesses whether borrowers could still afford their mortgages if, at any point over the first five years of the loan, Bank Rate were to be 3 percentage points higher than the prevailing rate at origination. This Recommendation is intended to be read together with the FCA requirements around considering the effect of future interest rate rises as set out in MCOB 11.6.18(2).

This Recommendation has been superseded by 17/Q2/1, to clarify the rate to which the 3 percentage points stress should be applied, following a review by the FPC. Details of the review and the reasons for the clarification are set out in a chapter of this *Report*: 'The FPC's approach to addressing risks from the UK mortgage market'.

14/Q3/1	Powers of Direction over housing instruments	Implemented
---------	--	-------------

The FPC recommends that HM Treasury exercise its statutory power to enable the FPC to direct, if necessary to protect and enhance financial stability, the PRA and FCA to require regulated lenders to place limits on residential mortgage lending, both owner-occupied and buy-to-let, by reference to: (a) loan to value ratios; and (b) debt to income ratios, including interest coverage ratios in respect of buy-to-let lending.

Legislation granting the FPC powers of Direction over loan to value and debt to income limits in respect of mortgages on owner-occupied properties came into force in April 2015.

Over 2015 and 2016, HM Treasury consulted on granting the FPC powers of Direction over buy-to-let lending. It published a consultation response document and laid the final legislation before Parliament on 16 November. These powers were approved in December and are now in place.

The FPC therefore decided to consider this Recommendation as implemented at its meeting on 22 March 2017.

15/Q2/3	CBEST vulnerability testing	Implemented
---------	------------------------------------	-------------

The FPC recommends that the Bank, the PRA and the FCA work with firms at the core of the UK financial system to ensure that they complete CBEST tests and adopt individual cyber resilience action plans. The Bank, the PRA and the FCA should also establish arrangements for CBEST tests to become one component of regular cyber resilience assessment within the UK financial system.

Since 2014, 31 out of 34 firms have finished testing, and two further firms are close to completion. The first round of CBEST testing is therefore materially complete. Consistent with the FPC's Recommendation, CBEST will become a regular component of supervisory assessment of firms. Financial services firms and market infrastructures at the core of the UK financial system will be expected to conduct their own regular tests of cyber resilience. They will also be subject to supervisor-led CBEST testing at regular intervals. The frequency of these tests will be proportionate to firms' importance for financial stability. CBEST is also being adopted in other jurisdictions and sectors.

Based on the progress made, the FPC judged at its meeting on 21 June 2017 that its 2015 Recommendation has been implemented. The summary of the review is set out in a box in this *Report*: 'Building cyber resilience in the UK financial system'.

16/Q2/1	Distribution of capital to meet 'fair shares' of systemic buffers	Implemented
---------	--	-------------

The FPC recommends to the PRA that it should seek to ensure that, where systemic buffers apply at different levels of consolidation, there is sufficient capital within the consolidated group, and distributed appropriately across it, to address both global systemic risks and domestic systemic risks.

This Recommendation was made at the FPC's May 2016 meeting to agree the final systemic risk buffer (SRB) framework.

Following a consultation in 2016 H2, the PRA published on 1 February 2017 its Policy Statement on the implementation of ringfencing.⁽¹⁾ This outlined how it would implement the FPC's Recommendation. The FPC therefore decided at its meeting on 22 March 2017 to consider this Recommendation as implemented, given that the PRA's Policy Statement was in place.

Recommendations and Directions currently outstanding

17/Q2/1	FPC Recommendation on mortgage affordability tests	Action under way
---------	---	------------------

When assessing affordability, mortgage lenders should apply an interest rate stress test that assesses whether borrowers could still afford their mortgages if, at any point over the first five years of the loan, their mortgage rate were to be 3 percentage points higher than the reversion rate specified in the mortgage contract at the time of origination (or, if the mortgage contract does not specify a reversion rate, 3 percentage points higher than the product rate at origination). This Recommendation is intended to be read together with the FCA requirements around considering the effect of future interest rate rises as set out in MCOB 11.6.18(2). This Recommendation applies to all lenders which extend residential mortgage lending in excess of £100 million per annum.

This Recommendation was made at the FPC's meeting on 21 June 2017. Relative to the previous Recommendation on mortgage affordability tests (14/Q2/1), it clarified the rate to which the 3 percentage points stress should be applied and introduced a *de minimis* threshold. The explanation for this Recommendation is set out in a chapter of this *Report*: 'The FPC's approach to addressing risks from the UK mortgage market'.

(1) www.bankofengland.co.uk/pr/Pages/publications/ps/2017/ps317.aspx.

Other FPC policy decisions which remain in place

Set out below are previous FPC decisions, which remain in force, on the setting of its policy tools. The calibration of these tools is kept under review.

Countercyclical capital buffer (CCyB)

The FPC is increasing the UK CCyB rate to 0.5%, from 0%, with binding effect from 27 June 2018. Absent a material change in the outlook, and consistent with its stated policy for a standard risk environment and of moving gradually, the FPC expects to increase the rate to 1% at its November meeting, with binding effect a year after that. This rate is reviewed on a quarterly basis.

The United Kingdom has also previously reciprocated a number of foreign CCyB decisions — for more details see the Bank of England website.⁽¹⁾ Under PRA rules, foreign CCyB rates applying from 2016 onwards will be automatically reciprocated up to and including 2.5%.

Recommendation on loan to income ratios

In June 2014, the FPC made the following Recommendation (14/Q2/2):

The Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) should ensure that mortgage lenders do not extend more than 15% of their total number of new residential mortgages at loan to income ratios at or greater than 4.5. This Recommendation applies to all lenders which extend residential mortgage lending in excess of £100 million per annum. The Recommendation should be implemented as soon as practicable.

The PRA and the FCA have published their respective approaches to implementing this Recommendation: the PRA has issued a Policy Statement, including rules,⁽²⁾ and the FCA has issued general guidance.

The FPC reviewed this Recommendation in November 2016 and decided not to amend the calibration. The explanation for this is set out in the November 2016 *Financial Stability Report*.

Other FPC activities since the previous Report

The Bank of England's financial stability objective is to 'protect and enhance the stability of the financial system of the United Kingdom'. This is defined by Parliament, through the Bank of England Act 1998. The Court of Directors of the Bank has a statutory responsibility to determine the Bank's strategy in relation to this objective and to review it at least every three years. Court has delegated the review of the strategy to the FPC, as permitted by the Act; but Court retains ultimate responsibility for the strategy.

At its 2017 Q2 meeting, the FPC agreed the Bank's financial stability strategy, following its review of the strategy that was set by Court in 2014, and following consultation, as required by statute, with HM Treasury. The strategy will be published in the Bank's forthcoming Annual Report.

(1) www.bankofengland.co.uk/financialstability/Pages/fpc/ccbrates.aspx.

(2) www.bankofengland.co.uk/pr/Pages/publications/ps/2014/ps914.aspx.

Annex 2: Core indicators

Table A.1 Core indicator set for the countercyclical capital buffer^(a)

Indicator	Average, 1987–2006 ^(b)	Average 2006 ^(c)	Minimum since 1987 ^(b)	Maximum since 1987 ^(b)	Previous value (oya)	Latest value (as of 16 June 2017)
Non-bank balance sheet stretch^(d)						
1 Credit to GDP ^(e)						
Ratio	117.1%	152.1%	86.9%	172.2%	140.6%	145.2% (2016 Q4)
Gap	6.4%	6.2%	-25.6%	20.8%	-22.5%	-15.6% (2016 Q4)
2 Private non-financial sector credit growth ^(f)	10.1%	9.8%	-3.1%	22.8%	2.5%	4.5% (2016 Q4)
3 Net foreign asset position to GDP ^(g)	-2.3%	-10.3%	-22.4%	24.2%	-4.6%	24.2% (2016 Q4)
4 Gross external debt to GDP ^(h)	183.0%	309.9%	114.2%	398.0%	295.0%	313.7% (2016 Q4)
<i>of which bank debt to GDP</i>	120.9%	195.0%	78.6%	267.6%	161.0%	177.2% (2016 Q4)
5 Current account balance to GDP ⁽ⁱ⁾	-1.7%	-2.2%	-6.0%	0.8%	-5.5%	-2.4% (2016 Q4)
Conditions and terms in markets						
6 Long-term real interest rate ^(j)	1.45%	1.23%	-2.05%	2.18%	-1.17%	-1.54% (16 June 2017)
7 VIX ^(k)	19.1	12.8	10.5	65.5	15.5	10.6 (16 June 2017)
8 Global corporate bond spreads ^(l)	84 bps	84 bps	74 bps	482 bps	150 bps	113 bps (16 June 2017)
9 Spreads on new UK lending						
Household ^(m)	480 bps	352 bps	285 bps	850 bps	656 bps	636 bps (Apr. 2017)
Corporate ⁽ⁿ⁾	104 bps	97 bps	82 bps	392 bps	234 bps	225 bps (Dec. 2016)
Bank balance sheet stretch^(o)						
10 Capital ratio						
Basel II core Tier 1 ^(p)	6.6%	6.3%	6.1%	12.3%	n.a.	n.a.
Basel III common equity Tier 1 ^(q)	n.a.	n.a.	n.a.	n.a.	12.3%	13.9% (2017 Q1)
11 Leverage ratio ^(r)						
Simple	4.7%	4.1%	2.9%	6.6%	6.6%	6.6% (2016 H2)
Basel III (2014 proposal)	n.a.	n.a.	n.a.	n.a.	4.9%	4.9% (2016 H2)
12 Average risk weights ^(s)	53.6%	46.4%	33.4%	65.4%	36.5%	33.4% (2016 H2)
13 Return on assets before tax ^(t)	1.0%	1.1%	-0.2%	1.5%	0.4%	0.3% (2016 H2)
14 Loan to deposit ratio ^(u)	114.5%	132.4%	93.3%	133.3%	97.1%	93.3% (2016 H2)
15 Short-term wholesale funding ratio ^(v)	n.a.	24.6%	10.1%	26.7%	10.5%	10.1% (end-2016)
<i>of which excluding repo funding</i>	n.a.	15.8%	4.5%	15.8%	4.5%	4.9% (end-2016)
16 Overseas exposures indicator: countries to which UK banks have 'large' and 'rapidly growing' total exposures ^{(w)(x)}						
		In 2006 Q4: AU, BR, CA, CH, CN, DE, ES, FR, IE, IN, JP, KR, KY, LU, NL, US, ZA			In 2016 Q1: KY	In 2017 Q1: CH, DE, JP, KY, NL, TW
17 CDS premia ^(y)	12 bps	8 bps	6 bps	298 bps	132 bps	58 bps (June 2017)
18 Bank equity measures						
Price to book ratio ^(z)	2.13	1.94	0.49	2.86	0.57	0.84 (June 2017)
Market-based leverage ratio ^(aa)	9.7%	7.8%	1.9%	15.7%	3.5%	5.5% (June 2017)

Table A.2 Core indicator set for sectoral capital requirements^(a)

Indicator	Average, 1987–2006 ^(b)	Average 2006 ^(c)	Minimum since 1987 ^(b)	Maximum since 1987 ^(b)	Previous value (oya)	Latest value (as of 16 June 2017)
Bank balance sheet stretch^(o)						
1 Capital ratio						
Basel II core Tier 1 ^(p)	6.6%	6.3%	6.1%	12.3%	n.a.	n.a.
Basel III common equity Tier 1 ^(q)	n.a.	n.a.	n.a.	n.a.	12.3%	13.9% (2017 Q1)
2 Leverage ratio ^(r)						
Simple	4.7%	4.1%	2.9%	6.6%	6.6%	6.6% (2016 H2)
Basel III (2014 proposal)	n.a.	n.a.	n.a.	n.a.	4.9%	4.9% (2016 H2)
3 Average mortgage risk weights ^(ab)	n.a.	n.a.	12.6%	22.4%	14.2%	12.6% (2016 H2)
UK average mortgage risk weights ^(ac)	n.a.	n.a.	10.5%	15.8%	11.0%	10.5% (2016 H2)
4 Balance sheet interconnectedness ^(ad)						
Intra-financial lending growth ^(ae)	12.0%	13.0%	-18.4%	45.5%	-18.4%	5.2% (2016 H2)
Intra-financial borrowing growth ^(af)	14.1%	13.7%	-21.5%	33.1%	-16.9%	33.1% (2016 H2)
Derivatives growth (notional) ^(ag)	37.7%	34.2%	-25.9%	52.0%	-19.1%	12.1% (2016 H2)
5 Overseas exposures indicator: countries to which UK banks have 'large' and 'rapidly growing' non-bank private sector exposures ^{(ah)(x)}		In 2006 Q4: AU, CA, DE, ES, FR, IE, IT, JP, KR, KY, NL, US, ZA			In 2016 Q1: KY	In 2017 Q1: KY
Non-bank balance sheet stretch^(d)						
6 Credit growth						
Household ^(ai)	10.3%	11.2%	-0.6%	19.6%	3.7%	4.5% (2016 Q4)
Commercial real estate ^(aj)	15.3%	18.5%	-9.7%	59.8%	0.0%	0.7% (2017 Q1)
7 Household debt to income ratio ^(ak)	100.1%	141.8%	78.2%	150.5%	132.2%	135.0% (2016 Q4)
8 PNFC debt to profit ratio ^(al)	237.0%	297.0%	157.0%	407.4%	272.8%	294.3% (2016 Q4)
9 NBF1 debt to GDP ratio (excluding insurance companies and pension funds) ^(am)	56.4%	122.0%	14.0%	176.8%	126.3%	125.6% (2016 Q4)
Conditions and terms in markets						
10 Real estate valuations						
Residential price to rent ratio ^(an)	100.0	151.1	66.9	160.6	139.6	142.9 (2017 Q1)
Commercial prime market yields ^(ao)	5.4%	4.1%	3.8%	7.1%	4.1%	4.0% (2017 Q1)
Commercial secondary market yields ^(ao)	8.5%	5.6%	5.1%	10.2%	5.8%	6.0% (2017 Q1)
11 Real estate lending terms						
Residential mortgage LTV ratio (mean above the median) ^(ap)	90.6%	90.6%	81.6%	90.8%	86.7%	87.3% (2017 Q1)
Residential mortgage LTI ratio (mean above the median) ^(ap)	3.8	3.8	3.6	4.2	4.1	4.2 (2017 Q1)
Commercial real estate mortgage LTV (average maximum) ^(aq)	77.6%	78.3%	57.5%	79.6%	62.6%	57.5% (2016 H2)
12 Spreads on new UK lending						
Residential mortgage ^(ar)	80 bps	51 bps	35 bps	379 bps	176 bps	161 bps (Apr. 2017)
Commercial real estate ^(as)	137 bps	135 bps	119 bps	422 bps	264 bps	254 bps (2016 Q4)

- (a) A spreadsheet of the series shown in this table is available at www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx.
- (b) If the series starts after 1987, the average between the start date and 2006 end and the maximum/minimum since the start date are used.
- (c) 2006 was the last year before the start of the global financial crisis.
- (d) The current vintage of ONS data is not available prior to 1997. Data prior to this and beginning in 1987 have been assumed to remain unchanged since *The Blue Book 2013*.
- (e) 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 except for the unfunded pension liabilities and financial derivatives of the not-for-profit sector, and private non-financial corporations' (PNFCs') loans and debt securities excluding direct investment loans and loans secured on dwellings. 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. See *Counterycyrcial Capital Buffer Guide* at www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx for further explanation of how this series is calculated. Sources: BBA, ONS Revell, J and Roe, A (1971); 'National balance sheets and national accounting – a progress report', *Economic Trends*, No. 211 and Bank calculations.
- (f) Twelve-month growth rate of nominal credit (defined as the four-quarter cumulative net flow of credit as a proportion of the stock of credit twelve months ago). Credit is defined as above. Sources: ONS and Bank calculations.
- (g) As per cent of annual GDP (four-quarter moving sum). Sources: ONS and Bank calculations.
- (h) Ratios computed using a four-quarter moving sum of GDP. Monetary financial institutions (MFIs) cover banks and building societies resident in the United Kingdom. Sources: ONS and Bank calculations.
- (i) As per cent of quarterly GDP. Sources: ONS and Bank calculations.
- (j) Five-year real interest rates five years forward, implied from inflation swaps and nominal fitted yields. Data series runs from October 2004. Sources: Bloomberg and Bank calculations.
- (k) Measure of market expectations of 30-day volatility. Conveyed by S&P 500 stock index option prices (one-month moving average). Sources: Bloomberg and Bank calculations.
- (l) Global corporate bond spreads' refers to a one-month moving average of the global aggregate market non-financial corporate bond spread. This tracks the performance of investment-grade corporate debt publicly issued in the global and regional markets from both developed and emerging market issuers. Index constituents are weighted based on market value. Spreads are option-adjusted (ie they show the number of basis points the matched-maturity government spot curve needs to be shifted in order to match a bond's present value of discounted cash flows). Prior to 2016, published versions of this indicator showed the BofA Merrill Lynch Global Industrial Index. Sources: Barclays and Bank calculations.
- (m) The household lending spread is a weighted average of mortgage and unsecured lending spreads, with weights based on relative volumes of new lending. The mortgage spread is a weighted average of quoted mortgage rates over risk-free rates, using 90% LTV two-year fixed-rate mortgages and 75% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products. Spreads are taken relative to Bank Rate for the tracker product. The unsecured component is a weighted average of spreads on credit cards, overdrafts and personal loans. Spreads on unsecured lending are taken relative to Bank Rate. FCA Product Sales Data includes regulated mortgage contracts only but is used to weight all mortgage products. Series starts in 1997. Sources: Bank of England, Bloomberg, Council of Mortgage Lenders, FCA Product Sales Data and Bank calculations.
- (n) The UK corporate lending spread is a weighted average of: SME lending rates over Bank Rate; CRE average senior loan margins 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). Weights are based on relative amounts outstanding of loans. Series starts in October 2002. Sources: Bank of America Merrill Lynch Global Research, Bank of England, Bloomberg, British Bankers' Association, De Montfort University, Department for Business, Energy and Industrial Strategy and Bank calculations.
- (o) 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 Banking Group (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); National Westminster (until 1999); Nationwide; 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.
- (p) Major UK banks' aggregate core Tier 1 capital as a percentage of their aggregate risk-weighted assets. The core Tier 1 capital ratio series starts in 2000 and uses the major UK banks peer group as at 2014 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 PRA definitions. Prior to 2008, that measure was not typically disclosed and Bank calculations approximating it as previously published in the *Financial Stability Report* are used. The series are annual until end-2012, half-yearly until end-2013 and quarterly afterwards. Sources: PRA regulatory returns, published accounts and Bank calculations.
- (q) The Basel II series was discontinued with CRD IV implementation on 1 January 2014. The 'Basel III common equity Tier 1 capital ratio' is calculated as aggregate peer group common equity Tier 1 levels over aggregate risk-weighted assets, according to the CRD IV definition as implemented in the United Kingdom. The Basel III peer group includes Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK. Sources: PRA regulatory returns and Bank calculations.
- (r) A simple leverage ratio calculated as aggregate peer group equity (shareholders' claims) over aggregate peer group assets over aggregate Basel 2010 leverage ratio exposure. The Basel III (2014) series corresponds to aggregate peer group CRD IV end-point Tier 1 capital over aggregate Basel 2014 exposure measure. Note that the simple series excludes Northern Rock/Virgin Money from 2008. The Basel III series consists of Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK. The latest value uses latest published figures, in the case of Nationwide these relate to 2016 H1. The series are annual until end-2012 and half-yearly afterwards. On 25 July 2016, the FPC recommended to the PRA that, when applying its rules on the leverage ratio, it considers allowing firms to exclude from the calculation of the total exposure measure those assets constituting claims on central banks where they are matched by deposits accepted by the firm that are denominated in the same currency and of identical or longer maturity. No adjustment has been made to the calculated leverage ratio reported here for this policy. Sources: PRA regulatory returns, published accounts and Bank calculations.
- (s) Aggregate end-year peer group risk-weighted assets divided by aggregate end-year peer group published balance sheet assets. Data for 2014 H1 onwards are on a CRD IV basis. Series begins in 1992 and is annual until end-2012 and half-yearly afterwards. Latest published figures have been used, in the case of Nationwide, these relate to 2016 H1. Sources: Published accounts and Bank calculations.
- (t) Calculated as major UK banks' annual profit before tax as a proportion of total assets, averaged over the current and previous year. When banks in the sample have merged, aggregate profits for the year are approximated by those of the acquiring group. Series is annual until 2015 when it becomes semi-annual. The latest value uses latest published figures, in the case of Nationwide these relate to 2016 H1. Sources: Published accounts and Bank calculations.
- (u) Major UK banks' loans and advances to customers as a percentage of customer deposits, 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 and is annual until end-2012 and half-yearly afterwards. The latest value uses latest published figures, in the case of Nationwide these relate to 2016 H1. Sources: Published accounts and Bank calculations.
- (v) Share of total funding (including capital) accounted for by wholesale funding with residual maturity of under three months. Wholesale funding comprises deposits by banks, debt securities, subordinated liabilities and repo. Funding is proxied by total liabilities excluding derivatives and liabilities to customers under investment contracts. Where underlying data are not published estimates have been used. Repo includes repurchase agreements and securities lending. The series starts in 2005. In the latest value, Nationwide's 2015 data are used as these are the latest published full-year results. Sources: Published accounts and Bank calculations.
- (w) This indicator highlights the countries where UK-owned monetary financial institutions' (MFIs) overall exposures are greater than 10% of UK-owned MFIs' tangible equity on an ultimate risk basis and have grown by more than 1.5 times nominal GDP growth in that country. Foreign exposures as defined in BIS consolidated banking statistics. Uses latest data available, with the exception of tangible equity figures for 2006-07, which are estimated using published accounts. Sources: Bank of England, ECB, IMF *World Economic Outlook (WEO)*, Thomson Reuters Datastream, published accounts and Bank calculations.
- (x) Abbreviations used are: Australia (AU), Brazil (BR), Canada (CA), Switzerland (CH), People's Republic of China (CN), Germany (DE), Spain (ES), France (FR), Ireland (IE), Italy (IT), India (IN), Japan (JP), Republic of Korea (KR), Cayman Islands (KY), Luxembourg (LU), Luxembourg (NL), Taiwan (TW), United States (US) and South Africa (ZA).
- (y) Average of major UK banks' five-year senior CDS premia, weighted by total assets until 2014 and by half-year total assets from 2015. Series starts in 2003. In the latest value Nationwide's senior CDS is weighted by 2016 H1 total assets as the latest published figures relate to 2016 H1. Sources: Market Group Limited, published accounts and Bank calculations.
- (z) Relates the share price with the book, or accounting, value of shareholders' equity per share. Averages of the ratios in the peer group, weighted by end-year total assets. The sample comprises the major UK banks and National Australia Bank between 2005 and 2015 H2, excluding Britannia, Co-operative Banking Group, and Nationwide. Northern Rock/Virgin Money is excluded from 2008. Series starts in 2000. Sources: Thomson Reuters Datastream, published accounts and Bank calculations.
- (aa) 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 Banking Group and Nationwide. National Australia Bank is included between 2005 and 2015 H2. Northern Rock/Virgin Money is excluded from 2008. Series starts in 2000. Sources: Thomson Reuters Datastream, published accounts and Bank calculations.
- (ab) Sample consists of Barclays Group, Co-operative Banking Group, HSBC Holdings Group, Lloyds Banking Group, Nationwide Building Society Group, RBS Group, Santander UK Group and excludes Nationwide for 2008 H2 only. Average risk weights for residential mortgages (exposures on the Retail IRB method only) are calculated as total risk-weighted assets divided by total exposure value for all banks in the sample. Calculated on a consolidated basis, except for Nationwide for 2014 H2/2015 H1 where only solo data were available. Series starts in 2009 and is updated half-yearly. Sources: PRA regulatory returns and Bank calculations.
- (ac) Sample consists of Bank of Scotland, Barclays Bank, HSBC Bank, Lloyds Bank, National Westminster Bank, Nationwide, Santander UK, Co-operative Bank, Royal Bank of Scotland, Ulster Bank and excludes Nationwide for 2008 H2 only. Average risk weights for residential mortgages (exposures on the Retail IRB method only) are calculated as total risk-weighted assets divided by total exposure value for all banks in the sample. Calculated on an unconsolidated basis, Royal Bank of Scotland data includes National Westminster, Ulster Bank and RBS. Historical data updated as of June 2016 to improve data series consistency. Series starts in 2009 and is updated half-yearly. Sources: PRA regulatory returns and Bank calculations.
- (ad) 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 adjusted for the acquisitions of Midland by HSBC in 1992, and of ABN AMRO by RBS in 2007 to avoid reporting large growth rates resulting from step changes in the size and interconnectedness of the major UK bank peer group. Series exclude National Australia Bank.
- (ae) Lending to other banks and other financial corporations. Growth rates are year on year. Latest value shows growth rate for year to 2016 H2. Data point excludes National Australia Bank. Sources: Published accounts and Bank calculations.
- (af) Wholesale borrowing, composed of deposits from banks and non-subordinated securities in issue. Growth rates are year-on-year. Latest value shows growth rate for year to 2016 H2. Data point excludes National Australia Bank. One weakness of the current measure is that it is not possible to distinguish between retail deposits and deposits placed by non-bank financial institutions on a consolidated basis. Sources: Published accounts and Bank calculations.
- (ag) 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 the future should market shares change. Series starts in 2002. Growth rates are year on year. Latest value shows growth rate for year to 2016 H2. Sources: Published accounts and Bank calculations.
- (ah) This indicator highlights the countries where UK-owned MFIs' non-bank private sector exposures are greater than 10% of UK-owned MFIs' tangible equity on an ultimate risk basis and have grown by more than 1.5 times nominal GDP growth in that country. Foreign exposures as defined in BIS consolidated banking statistics. Overseas sectoral exposures cannot currently be broken down further at the non-bank private sector level. The intention is to divide them into households and corporates as new data become available. Uses latest data available, with the exception of tangible equity figures for 2006-07, which are estimated using published accounts. Sources: Bank of England, ECB, IMF *World Economic Outlook (WEO)*, Thomson Reuters Datastream, published accounts and Bank calculations.
- (ai) The twelve month growth rate of nominal credit. Defined as the four quarter cumulative net flow of credit divided by the stock of credit twelve months ago. Credit is defined as all liabilities of the household and not-for-profit sector except for the unfunded pension liabilities and financial derivatives of the not-for-profit sector. Sources: ONS and Bank calculations.
- (aj) Four-quarter growth rate of UK-resident MFIs' loans to the real estate sector. The real estate sector is defined as: buying, selling and renting of own or leased real estate; real estate and related activities on a fee or contract basis; and development of buildings. Non seasonally adjusted. Quarterly data. Data cover lending in both sterling and foreign currency from 1998 Q4. Prior to this period, data cover sterling only. Source: Bank of England.
- (ak) Gross debt as a percentage of a four-quarter moving sum of gross disposable income of the UK household and non-profit sector. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. Disposable income is adjusted for financial intermediation services indirectly measured (FISIM) and changes in pension entitlements. Sources: ONS and Bank calculations.
- (al) 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. The corporate gross operating surplus series is adjusted for FISIM. Sources: ONS and Bank calculations.
- (am) Gross debt as a percentage of four-quarter moving sum of nominal GDP. The NBFJ sector includes all financial corporations apart from monetary financial institutions (ie deposit taking institutions). This indicator additionally excludes insurance companies and pension funds. Sources: ONS and Bank calculations.
- (an) Ratio between an average of the seasonally adjusted Halifax and Nationwide house price indices and RPI housing rent. The series is rebased so that the average between 1987 and 2006 is 100. Sources: Halifax/Market, Nationwide, ONS and Bank calculations.
- (ao) The prime (secondary) yield is the ratio between the weighted averages, across the lowest (highest) yielding quartile of commercial properties, of MSCI Inc.'s measures of rental income and capital values. Sources: MSCI Inc. and Bank calculations.
- (ap) Mean LTV (respectively LTI) ratio on new advances above the median LTV (LTI) ratio, based on loans to first-time buyers, council/registered social tenants exercising their right to buy and homemovers, and excluding lifetime mortgages and advances with LTV above 130% (LTI above 10x). FCA Product Sales Data includes regulated mortgage contracts only. Series starts in 2005. Sources: FCA Product Sales Data and Bank calculations.
- (aq) Average of the maximum offered loan to value ratios across major CRE lenders. Series starts in 2002. Sources: De Montfort University and Bank calculations.
- (ar) The residential mortgage lending spread is a weighted average of quoted mortgage rates over risk-free rates, using 90% LTV two-year fixed-rate mortgages and 75% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products. Spreads are taken relative to Bank Rate for the tracker product. Weights based on relative volumes of new lending. Series starts in 1997. FCA Product Sales Data includes regulated mortgage contracts only. Sources: Bank of England, Bloomberg, Council of Mortgage Lenders, FCA Product Sales Data and Bank calculations.
- (as) The CRE lending spread is the average of senior loan margins across major CRE lenders relative to Bank Rate. Series starts in 2002. Sources: Bank of England, Bloomberg, De Montfort University and Bank calculations.

Table A.3 Core indicator set for LTV and DTI limits^(a)

Indicator	Average, 1987–2006 ^(b)	Average 2006 ^(c)	Minimum since 1987 ^(b)	Maximum since 1987 ^(b)	Previous value (oya)	Latest value (as of 16 June 2017)
Lender and household balance sheet stretch						
1 LTI and LTV ratios on new residential mortgages						
Owner-occupier mortgage LTV ratio (mean above the median) ^(d)	90.6%	90.6%	81.6%	90.8%	86.7%	87.3% (2017 Q1)
Owner-occupier mortgage LTI ratio (mean above the median) ^(d)	3.8	3.8	3.6	4.2	4.1	4.2 (2017 Q1)
Buy-to-let mortgage LTV ratio (mean) ^(e)	n.a.	n.a.	63.8%	75.4%	65.9%	63.8% (2016 Q4)
2 Household credit growth ^(f)						
	10.3%	11.2%	-0.6%	19.6%	3.7%	4.5% (2016 Q4)
3 Household debt to income ratio ^(g)						
<i>of which: mortgages^(h)</i>	70.8%	103.8%	50.7%	113.2%	101.0%	101.0% (2016 Q4)
<i>of which: owner-occupier mortgages⁽ⁱ⁾</i>	80.6%	95.0%	67.2%	100.0%	84.3%	83.6% (2016 Q4)
Conditions and terms in markets						
4 Approvals of loans secured on dwellings ^(j)						
	97,922	119,045	26,702	134,710	66,182	64,645 (Apr. 2017)
5 Housing transactions ^(k)						
Advances to homemovers ^(l)	48,985	59,342	14,300	93,500	22,000	25,700 (Apr. 2017)
% interest only ^(m)	53.3%	31.0%	1.8%	81.3%	1.8%	2.3% (Apr. 2017)
Advances to first-time buyers ^(l)	39,179	33,567	8,500	55,800	24,800	25,400 (Apr. 2017)
% interest only ^(m)	52.1%	24.0%	0.0%	87.9%	0.0%	0.0% (Apr. 2017)
Advances to buy-to-let purchasers ^(l)	10,128	14,113	3,600	29,100	4,200	5,300 (Apr. 2017)
% interest only ⁽ⁿ⁾	n.a.	n.a.	50.0%	74.3%	74.3%	72.4% (2017 Q1)
6 House price growth ^(o)						
	1.8%	2.2%	-5.6%	7.0%	1.4%	-0.2% (May 2017)
7 House price to household disposable income ratio ^(p)						
	3.0	4.6	2.2	4.8	4.4	4.6 (2016 Q4)
8 Rental yield ^(q)						
	5.8%	5.1%	4.8%	7.6%	5.0%	4.8% (Apr. 2017)
9 Spreads on new residential mortgage lending						
All residential mortgages ^(r)	80 bps	51 bps	35 bps	379 bps	176 bps	161 bps (Apr. 2017)
Difference between the spread on high and low LTV residential mortgage lending ^(r)	18 bps	25 bps	1 bps	293 bps	84 bps	101 bps (May 2017)
Buy-to-let mortgages ^(s)	n.a.	n.a.	61 bps	397 bps	259 bps	253 bps (2017 Q1)

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

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

(c) 2006 was the last year before the global financial crisis.

(d) Mean LTV (respectively LTI) ratio on new advances above the median LTV (LTI) ratio, based on loans to first-time buyers, council/registered social tenants exercising their right to buy and homemovers, and excluding lifetime mortgages and advances with LTV ratio above 130% (LTI above 10x). FCA Product Sales Data includes regulated mortgage contracts only. Series starts in 2005. Sources: FCA Product Sales Data and Bank calculations.

(e) Estimated mean LTV ratio of new non-regulated lending advances, of which buy-to-let is 88% by value. The figures include further advances and remortgages. The raw data is categorical: the share of mortgages with LTV ratio less than 75%, between 75% and 90%, between 90% and 95%, and greater than 95%. An approximate mean is calculated by giving these categories weights using the average LTV in equivalent buckets in loan level buy-to-let data gathered by the Council of Mortgage Lenders. Series starts in 2007. Council of Mortgage Lenders data available from 2014; weights prior to this date are average LTVs across the respective buckets using all data gathered in 2014. The share of mortgages with LTV ratio at 75% from 2014 onwards used are adjusted to estimate the LTV of each loan before any fees or charges are added. This approximates the LTV at which the loan was originated. Source: Bank of England, Council of Mortgage Lenders and Bank calculations.

(f) The twelve month growth rate of nominal credit. Defined as the four-quarter cumulative net flow of credit divided by the stock of credit twelve months ago. Credit is defined as all liabilities of the household and not-for-profit sector except for the unfunded pension liabilities and financial derivatives of the not-for-profit sector. Sources: ONS and Bank calculations.

(g) Gross debt as a percentage of a four-quarter moving sum of gross disposable income of the UK household and non-profit sector. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. Disposable income is adjusted for financial intermediation services indirectly measured (FISIM) and changes in pension entitlements. Sources: ONS and Bank calculations.

(h) Total debt secured on dwellings as a percentage of a four-quarter moving sum of gross disposable income of the UK household and non-profit sector. Disposable income is adjusted for FISIM and changes in pension entitlements. Sources: ONS and Bank calculations.

(i) Total debt associated with owner-occupier mortgages divided by the four-quarter moving sum of gross disposable income of the UK household and non-profit sector. Disposable income is adjusted for FISIM and changes in pension entitlements. Owner-occupier mortgage debt estimated by multiplying aggregate household debt secured on dwellings by the share of mortgages on lender balances that are not buy-to-let loans. Series starts in 1999. Sources: Council of Mortgage Lenders, ONS and Bank calculations.

(j) Data are for monthly number of house purchase approvals covering sterling lending by UK MFIs and other lenders to UK individuals. Approvals secured on dwellings are measured net of cancellations. Seasonally adjusted. Series starts in 1993. Source: Bank of England.

(k) The number of houses sold/bought in the current month is sourced from HMRC's Land Transaction Return. From 2008 the Return excluded properties priced at less than £40,000 (2006 and 2007 data have also been revised by HMRC to correct for this). Data prior to 2005 comes from the Survey of Property Transactions; the UK total figure is computed by assuming that transactions in the rest of the United Kingdom grew in line with England, Wales and Northern Ireland. Seasonally adjusted. Sources: Council of Mortgage Lenders, HMRC and Bank calculations.

(l) The number of new mortgages advanced for house purchase in the current month. Buy-to-let series starts in 2001. There are structural breaks in the series in April 2005 where the Council of Mortgage Lenders switches source. Data prior to 2002 are at a quarterly frequency. Sources: Council of Mortgage Lenders and Bank calculations.

(m) The share of new owner-occupied mortgages advanced for house purchase that are interest only. Interest-only mortgages exclude mixed capital and interest mortgages. There are structural breaks in the series in April 2005 where the Council of Mortgage Lenders switches source. Data prior to 2002 are at a quarterly frequency. Sources: Council of Mortgage Lenders and Bank calculations.

(n) The share of non-regulated mortgages that are interest only. The data include all mortgages, not just those for house purchase. Interest-only mortgages exclude mixed capital and interest mortgages. Sources: Bank of England and Bank calculations.

(o) House prices are calculated as the mean of the average UK house price as reported in the Halifax and Nationwide house price indices. Growth rate calculated as the percentage change three months on three months earlier. Series starts in 1991. Seasonally adjusted. Sources: Halifax/Markit, Nationwide and Bank calculations.

(p) The ratio is calculated using a four-quarter moving sum of gross disposable income of the UK household and non-profit sector per household as the denominator. Disposable income is adjusted for FISIM and changes in pension entitlements. Historical UK household population estimated using annual GB data assuming linear growth in the Northern Ireland household population between available data points. Series starts in 1990. Sources: Department for Communities and Local Government, Halifax/Markit, Nationwide, ONS and Bank calculations.

(q) Using Association of Residential Letting Agents (ARLA) data up until 2014. From 2015 onwards, the series uses LSL Property Services plc data normalised to the ARLA data over 2008 to 2014, when both series are available. Series starts in 2001. Sources: Association of Residential Letting Agents, LSL Property Services plc and Bank calculations.

(r) The overall spread on residential mortgage lending is a weighted average of quoted mortgage rates over risk-free rates, using 90% LTV two-year fixed-rate mortgages and 75% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products. Spreads are taken relative to Bank Rate for the tracker product. Weights are based on relative volumes of new lending. The difference in spread between high and low LTV lending is the rate on 90% LTV two-year fixed-rate mortgages less the 75% LTV two-year fixed-rate. Series starts in 1997. FCA Product Sales Data includes regulated mortgage contracts only. Sources: Bank of England, Bloomberg, Council of Mortgage Lenders, FCA Product Sales Data and Bank calculations.

(s) The spread on new buy-to-let mortgages is the weighted average effective spread charged on new floating and fixed-rate non-regulated mortgages over safe rates. Spreads are taken relative to Bank Rate for the floating-rate products. The safe rate for fixed-rate mortgages is calculated by weighting two-year, three-year and five-year gilts by the number of buy-to-let fixed-rate mortgage products offered at these maturities. Series starts in 2007. Sources: Bank of England, Bloomberg, Moneyfacts and Bank calculations.

Index of charts and tables

Charts

Executive summary

A	Major UK banks' capital ratios	ii
B	Annual growth rates of consumer credit products and household income	ii
C	China non-financial sector debt and growth of total social financing	iv
D	International ten-year real government bond yields	iv
E	Commercial real estate prices in the United Kingdom and ranges of sustainable valuations	iv

Box 1

A	Growth in credit to households and firms compared with nominal GDP growth	vi
---	---	----

Box 2

A	Net inward financing flows	ix
B	UK CRE transactions (gross quarterly flows)	ix

Part A

The FPC's approach to addressing risks from the UK mortgage market

A.1	UK house price to household income ratio	2
A.2	Completions of new dwellings in the United Kingdom	2
A.3	UK household debt to income ratio	3
A.4	Household debt to income ratio and consumption growth over 2007–12	3
A.5	Change in consumption relative to income among mortgagors with different LTI ratios between 2007 and 2009	3
A.6	Households in two-month arrears by mortgage DSR	4
A.7	Percentage of households with mortgage debt-servicing ratios of 40% or greater	4
A.8	Cumulative five-year loss rates on UK mortgages in past downturns and in stress tests	5
A.9	New mortgage lending by LTV at origination	5
A.10	UK mortgage books by indexed LTV	5
A.11	Mortgage rates on owner-occupier and buy-to-let lending relative to risk-free rates	6
A.12	Proportion of new mortgages with no fees	6
Fig. A.1	Feedback loops between mortgage credit and house prices can amplify a downturn	6
A.13	Composition of the outstanding mortgage stock	7
A.14	Relationship between the affordability test and the LTI flow limit in constraining lending	8
A.15	Flow of new mortgages by LTI	9
A.16	Share of new mortgages by mortgage term	9
A.17	LTI distribution of new mortgage lending	9
A.18	Risk weights on UK 'prime' mortgages by LTV	11

Box 4

A	Mortgages' LTV ratio and house price to income ratio	12
---	--	----

UK consumer credit

A.19	Annual growth rates of consumer credit products and household income	14
A.20	Spread between effective interest rates on new personal loans and Bank Rate	15
A.21	Interest-free periods of credit card balance transfer offers	15

A.22	Major UK banks' average risk weights on consumer credit exposures	16
A.23	End-2016 mortgage and personal loan portfolios of major UK banks, by year of issuance	16
A.24	UK banks' sterling write-offs on lending to individuals	17
A.25	Historical relationship between changes in unemployment and write-offs on non-credit card consumer credit exposures	17

Box 6

A	Composition of the stock of consumer credit, end-March 2017	18
B	Value of annual dealership car finance for new car purchases, and proportion of private new car purchases funded with dealership car finance	19

Global environment

A.26	International annual GDP growth projections	20
A.27	China non-financial sector debt and growth of total social financing	21
A.28	Domestic value added in exports to China	21
A.29	UK-owned banking groups' consolidated exposures to selected countries and regions	22
A.30	Ratio of non-performing loans and advances to total loans and advances (2016 Q4)	22

Asset valuations

A.31	International ten-year real government bond yields	23
A.32	Dispersion in implied volatilities in foreign exchange, interest rate and equity markets	24
A.33	High-yield corporate bond spreads	24
A.34	Changes in nominal ten-year interest rates since the <i>November Report</i>	25
A.35	Commercial real estate prices in the United Kingdom and ranges of sustainable valuations	25
A.36	Estimated losses in global corporate bond markets following a 100 basis point increase in interest rates	26
A.37	UK CRE debt reported to De Montfort University survey	26

Part B

Banking sector resilience

B.1	Major UK banks' capital ratios	27
B.2	Major UK banks' leverage ratios	28
B.3	Average interest rates on new lending and Bank Rate	30
B.4	UK banks' share prices and FTSE All-Share index since 1 January 2016	30
B.5	UK banks' statutory and underlying return on equity	31
B.6	UK banks' average price to book ratio	31
B.7	Price to book ratios for major global banks compared with expected returns on equity	31

Market-based finance

B.8	Net finance raised by UK private non-financial corporations (PNFCs)	34
B.9	Dealers' leverage ratios	35
B.10	Proportion of cash balance placed in repo of a major European asset manager, split by counterparty	36

B.11	Gilt repo rates paid by a group of pension fund asset managers in excess of expectations of policy interest rates	36
B.12	UK, French and German repo rates	36
B.13	Stock of property-related non-linked illiquid assets during 2016	37

Tables

Part A

The FPC's approach to addressing risks from the UK mortgage market

A.1	The Bank has an extensive toolkit to address risks from the UK mortgage market	1
A.2	Cuts in consumption between 2007 and 2009 among mortgagors with different LTI ratios	7
		10

Part B

Banking sector resilience

B.1	Selected measures of UK banks' funding costs	27
-----	--	----

Box 7

1	The FPC's Recommendations on cyber resilience	32
---	---	----

Market-based finance

		34
--	--	----

Box 8

1	Service characteristics of the renewed RTGS service	40
---	---	----

Annex 2: Core indicators

A.1	Core indicator set for the countercyclical capital buffer	45
A.2	Core indicator set for sectoral capital requirements	46
A.3	Core indicator set for LTV and DTI limits	48

Glossary and other information

Glossary of selected data and instruments

CDS – credit default swap.

CPI – consumer prices index.

GDP – gross domestic product.

HICP – harmonised index of consumer prices.

LCF – Living Costs and Food Survey.

RPI – retail prices index.

SVR – standard variable rate.

Abbreviations

ARF – Authorities' Response Framework.

AT1 – additional Tier 1.

BHPS – British Household Panel Survey.

BIS – Bank for International Settlements.

CBEST – UK Government's National Cyber Security Programme.

CBPS – Corporate Bond Purchase Scheme.

CCyB – countercyclical capital buffer.

CCP – central counterparty.

CEIC – CEIC Data Company Ltd.

CET1 – common equity Tier 1.

CGFS – Committee on the Global Financial System.

CIS – collective insurance schemes.

CML – Council of Mortgage Lenders.

CRD IV – Capital Requirements Directive.

CRE – commercial real estate.

DSR – debt-servicing ratio.

DTI – debt to income.

ECB – European Central Bank.

EEA – European Economic Area.

EIOPA – European Insurance Occupational Pensions Authority.

EME – emerging market economy.

EU – European Union.

FCA – Financial Conduct Authority.

FDI – foreign direct investment.

FISIM – financial intermediation services indirectly measured.

FMI – financial market infrastructure.

FPC – Financial Policy Committee.

FSA – Financial Services Authority.

FSB – Financial Stability Board.

FTSE – Financial Times Stock Exchange.

G7 – Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.

G20 – The Group of Twenty Finance Ministers and Central Bank Governors.

G-SIB – global systemically important bank.

HMRC – Her Majesty's Revenue and Customs.

HVPS – High-Value Payment System.

ICR – interest coverage ratio.

IFRS – International Financial Reporting Standard.

IIF – Institute of International Finance.

IMF – International Monetary Fund.

IOSCO – International Organization of Securities Commissions.

IRB – internal ratings based.

LTI – loan to income.

LTV – loan to value.

MCOB – Mortgages and Home Finance: Conduct of Business sourcebook.

MFI – monetary financial institution.

MPC – Monetary Policy Committee.

MREL – minimum requirement for own funds and eligible liabilities.

MSCI – Morgan Stanley Capital International Inc.

NBFI – non-bank financial institution.

NCSC – National Cyber Security Centre.

NSFR – Net Stable Funding Ratio.

OECD – Organisation for Economic Co-operation and Development.

ONS – Office for National Statistics.

OTC – over the counter.

PCP – personal contract purchase.

PNFC – private non-financial corporation.

PPI – payment protection insurance.

PRA – Prudential Regulation Authority.

PSD – Product Sales Database.

RBS – Royal Bank of Scotland.

RFB – ring-fenced bank.

RICS – Royal Institution of Chartered Surveyors.

RoE – return on equity.

RTGS – real-time gross settlement.

SME – small and medium-sized enterprise.

SMF – Sterling Monetary Framework.

SMMT – Society of Motor Manufacturers and Traders.

SRB – systemic risk buffer.

S&P – Standard & Poor's.

TFS – Term Funding Scheme.

WEO – IMF *World Economic Outlook*.