Financial Stability Report

July 2016 | Issue No. 39

BANK OF ENGLAND

On 13 December 2016, Chart B.11 was amended to correct a calculation used to produce the US bar.

On 15 July 2016, Chart A.17 was amended to correct a misclassification of certain non-commercial real estate (CRE) loans as CRE loans in the version of the chart published on 5 July 2016.

On 6 July 2016, the sixth paragraph on page vi of the Executive Summary was amended to correct the list of eligible participants in the Bank's indexed long-term repo operations.

BANK OF ENGLAND

Financial Stability Report

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July 2016

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BANK OF ENGLAND

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The primary responsibility of the Financial Policy Committee (FPC), a sub-committee of the Bank of England's Court of Directors, 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.

This document was delivered to the printers on 4 July 2016 and, unless otherwise stated, uses data available as at 1 July 2016.

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

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Executive summary

It is the statutory responsibility of the Financial Policy Committee (FPC) 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. By fulfilling this responsibility, the FPC ensures that risks to financial stability are addressed. Transparency about risks is essential to strengthen resilience and for plans to be put in place to manage those risks should they crystallise.

Consistent with its remit, the FPC identified in March the risks around the referendum on the United Kingdom's membership of the European Union as the most significant near-term domestic risks to financial stability.

The Committee had identified the following channels through which the referendum could increase risks to financial stability:

- the financing of the United Kingdom's large current account deficit, which relied on continuing material inflows of portfolio and foreign direct investment;
- the UK commercial real estate (CRE) market, which had experienced particularly strong inflows of capital from overseas and where valuations in some segments of the market had become stretched;
- the high level of UK household indebtedness, the vulnerability to higher unemployment and borrowing costs of the capacity of some households to service debts, and the potential for buy-to-let investors to behave procyclically, amplifying movements in the housing market;
- subdued growth in the global economy, including the euro area, which could be exacerbated by a prolonged period of heightened uncertainty; and
- fragilities in financial market functioning, which could be tested during a period of elevated market activity and volatility.

The FPC has monitored these channels of risk closely. There is evidence that some risks have begun to crystallise. The current outlook for UK financial stability is challenging.

There will be a period of uncertainty and adjustment following the result of the referendum. It will take time for the United Kingdom to establish new relationships with the European Union and the rest of the world. Some market and economic volatility is to be expected as this process unfolds.

The degree of uncertainty and nature of adjustment is evident in financial market prices, which have moved sharply following the referendum. Between 23 June and 1 July, the sterling exchange rate index fell by 9% and short-term volatility of sterling against the dollar rose to its highest level in the post-Bretton Woods era. Equity prices of UK banks have fallen on average by 20%, with UK-focused banks experiencing the largest falls. Equity prices of domestically focused companies have fallen by 10%. The ten-year UK

government bond yield fell by 52 basis points. These moves reflect an increase in risk premia on UK assets, a perceived weaker growth outlook, and anticipation of some future deterioration in the United Kingdom's terms of trade and supply capacity.

Rises in funding spreads for investment-grade borrowers and banks have been more than offset by falls in risk-free interest rates. Between 23 June and 1 July, investment-grade corporate bond yields fell by around 25 basis points. Wholesale debt funding costs for the major UK banks fell by a similar amount. Overall bank funding costs — taking into account any increase in the cost of equity and the change in wholesale debt funding costs — are broadly unchanged since the referendum.

During this period of uncertainty and adjustment, the resilience of the UK financial system, upon which financial stability depends, is grounded on:

- substantial capital and liquidity buffers, which have been shown in repeated stress tests to enable banks to absorb extremely severe economic and market shocks without amplifying those shocks;

- the regulatory framework of the United Kingdom that allows capital and liquidity buffers to be drawn on, as needed, to allow the system to cushion shocks and maintain the provision of financial services to the real economy; and

- an institutional framework that promotes co-ordinated, evidence-based responses to risks. This framework was used to develop and implement extensive contingency plans by UK authorities and firms in advance of the referendum. The Bank of England and HM Treasury co-ordinated with international authorities.

The FPC is focused on promoting a financial system that dampens, rather than amplifies, the impact of uncertainty and adjustment on the real economy. This means reducing any pressure on firms to restrict the provision of financial services, including the supply of credit and support for market functioning.

The FPC is monitoring closely the risks of: further deterioration in investor appetite for UK assets; adjustments in CRE markets leading to tighter credit conditions for businesses; increasing numbers of vulnerable households and procyclical behaviour of buy-to-let investors; the outlook for the global economy; and reduced and fragile liquidity in core financial markets.

Having consistently built over recent years the resilience that is necessary for the system to face this challenging outlook, the FPC stands ready to take actions that will ensure that capital and liquidity buffers can be drawn on, as needed, to support the supply of credit and in support of market functioning. At policy meetings on 28 June and 1 July:

- The FPC reduced the UK countercyclical capital buffer rate from 0.5% to 0% of banks' UK exposures with immediate effect (see Box 1). Absent any material change in the outlook, and given the need to give banks the clarity necessary to facilitate their capital planning, the FPC expects to maintain a 0% UK countercyclical capital buffer rate until at least June 2017. This action reinforces the FPC's expectation that all elements of the substantial capital and liquidity buffers that have been built up by banks are able to be drawn on, as necessary. It will reduce regulatory capital buffers by £5.7 billion, raising banks' capacity for lending to UK households and businesses by up to £150 billion.

- The FPC welcomed the Bank of England's announcement that it will continue to offer indexed long-term repo operations on a weekly basis until end-September 2016. This is a precautionary step to provide additional flexibility in the Bank's provision of liquidity insurance, further reinforcing the ability of firms to draw on their own liquidity buffers.

- The FPC supported the position of the Prudential Regulation Authority (PRA) to allow insurance companies to use the flexibility in Solvency II regulations to recalculate transitional measures. These measures smooth the impact of those regulations. Without them, the regulations, which came into force in January, would tighten regulatory constraints on insurance companies following sharp falls in market interest rates. At the margin, the recalculation of transitional measures is likely to reduce immediate pressure on insurance companies to sell corporate securities and other risky assets.

As the outlook evolves, the FPC stands ready to take any further actions deemed appropriate to support financial stability.

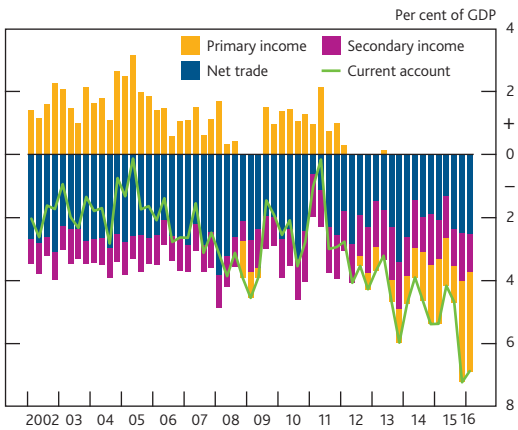
Risks around the EU referendum

Consistent with its remit, the FPC identified in March the **risks around the referendum** on the United Kingdom's membership of the European Union as the most significant near-term domestic risks to financial stability. It set out its assessment of those risks in the Statement following, and the Record of, its March meeting.

The financing of the United Kingdom's large current account deficit, which is high by historical and international standards (**Chart A**). The financing of the deficit is reliant on continuing material inflows of portfolio and foreign direct investment, which have been used to finance the public sector deficit and corporate investment, including in commercial real estate. A sudden shift in the supply of foreign capital and in the current account deficit would be associated with a sharp increase in risk premia and adjustment in sterling.

Chart A The UK current account deficit is high by historical and international standards

Decomposition of the UK current account(a)



Sources: ONS and Bank calculations.

(a) Primary income mainly consists of compensation of employees and net investment income. Secondary income consists of transfers.

*In the run-up to the referendum, there were signs that foreign portfolio inflows into UK equities had slowed. Following the referendum, sterling experienced its largest two-day fall against the dollar in the post-Bretton Woods era (**Chart B**). Risk premia on UK assets increased.*

Chart B Sterling fell sharply as the referendum result became clear

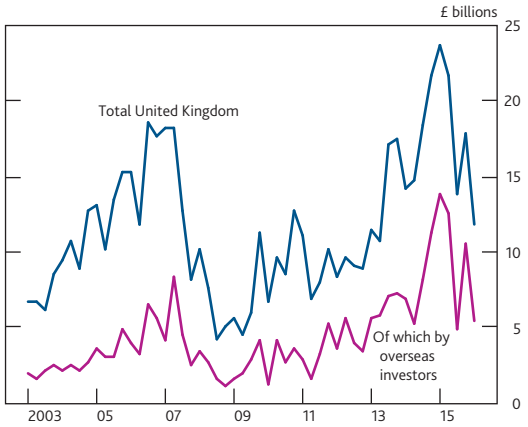
Sterling exchange rates

Source: Bloomberg.

The UK commercial real estate market, which had experienced particularly strong inflows of capital from overseas over recent years. Foreign investors accounted for around 45% of the value of total transactions since 2009. Valuations in some segments of the market, notably the prime London market, had become stretched.

*Foreign inflows of capital to the UK CRE market fell by almost 50% in the first quarter of 2016 (**Chart C**). More recently, share prices of real estate investment trusts have fallen sharply, reflecting the risk of future marked adjustments in commercial real estate prices.*

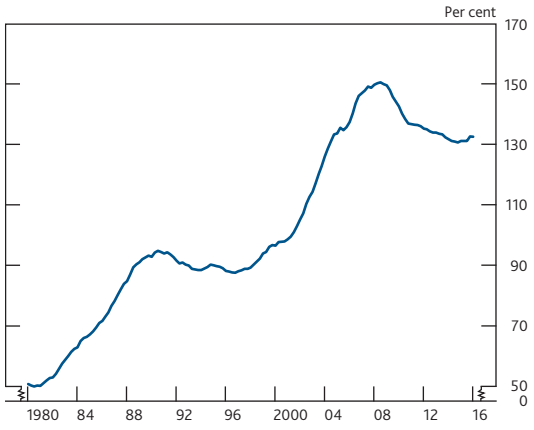
Chart C CRE transactions fell in early 2016
UK CRE transactions (gross quarterly flows)



Sources: The Property Archive and Bank calculations.

The high level of UK household indebtedness (**Chart D**), the vulnerability to higher unemployment and borrowing costs of the capacity of some households to service debts, and the potential for buy-to-let investors to behave procyclically, amplifying movements in the housing market.

Chart D Household indebtedness is elevated
UK household debt to income ratio[a]



Sources: ONS and Bank calculations.

(a) Gross debt as a percentage of a four-quarter moving sum of disposable income. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM).

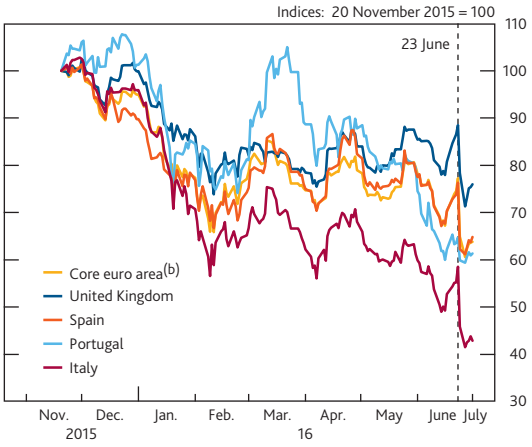
Given that the outlook for economic activity and employment has deteriorated, credit conditions may tighten. At its June meeting, the Monetary Policy Committee reported growing evidence that uncertainty about the referendum had led to delays to major economic decisions, which past evidence suggested could increase unemployment. There are early signs that these effects have continued since the referendum.

Survey evidence on the housing market has been difficult to interpret in recent months because of the impact of the pre-announced increase in stamp duty on additional properties, which took effect in April. Nevertheless, the RICS survey showed that expectations of housing market activity and price growth slowed sharply in May. New buyer enquiries in May were at the lowest level since 2008.

Subdued growth in the global economy, including the euro area, which could be exacerbated by a prolonged period of heightened uncertainty. This comes at a time when banks in some vulnerable euro-area countries are still working through legacy issues from the financial crisis and are facing challenges from operating in a low nominal interest rate environment.

*Since the referendum, long-term interest rates in the euro area have fallen further. Between 23 June and 1 July, the equity prices of banks in Italy and Spain fell by 27% and 15% respectively (**Chart E**). And the cost of default protection on banks associated with some vulnerable euro-area economies has risen.*

Chart E UK and euro-area banks equity prices have come under particular pressure
UK and euro-area bank equity indices[a]



Sources: SNL Financial, Thomson Reuters Datastream and Bank calculations.

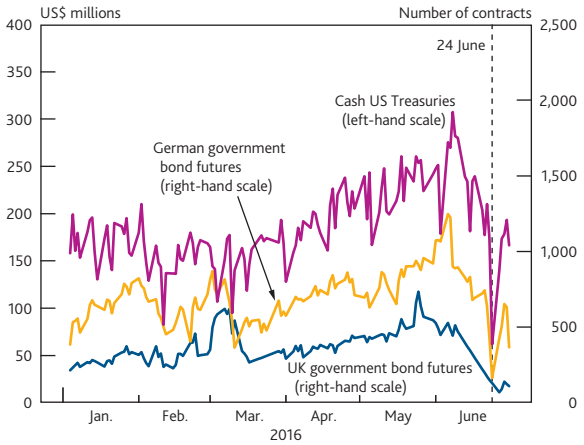
(a) Weighted by 2015 assets.
(b) Ten largest banks based on 2015 total assets in Austria, Belgium, France, Germany and the Netherlands.

Fragilities in financial market functioning, including reductions in the provision of market liquidity services in a number of core financial markets, such as government and corporate bond markets. These fragilities could be tested during a period of elevated market activity and volatility.

*Following the referendum, the foreign exchange market experienced particularly high volumes of transactions relative to normal levels with no apparent impairment of price discovery. Activity in some fixed-income markets has been subdued but largely orderly (**Chart F**). This means that the capacity of these markets has not to date been tested materially by market adjustments.*

Chart F Depth in government bond markets fell in the run-up to, and following, the referendum

Market depth in ten-year government bond markets[a]



Sources: Brokertec, Eurex, ICEU and JPMorgan Chase & Co.

(a) Measured as the volume available to transact at the three best bid and ask prices, averaged daily. US series refers to the benchmark ten-year government bond in the cash market. UK and German series refer to the benchmark ten-year government bond in the respective futures markets.

Resilience of the UK financial system

The resilience of the financial system, upon which financial stability depends, is its ability to withstand economic and financial shocks without amplifying their effect on the real economy by restricting the provision of financial services, including the supply of credit and support for market functioning.

The resilience of the UK financial system is grounded on:

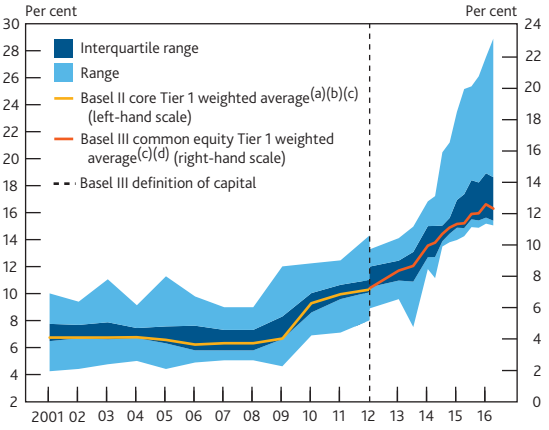
Capital and liquidity buffers

Over the past eight years, major UK banks have raised more than £130 billion of capital. The major UK banks' aggregate Tier 1 capital amounts to 13.5% of risk-weighted assets and 4.9% of aggregate exposures. They hold more than £600 billion of high-quality liquid assets, which is around four times the level they held before the financial crisis. Together, these **capital and liquidity buffers** give UK banks the flexibility they need to continue to lend to UK households and businesses, even during challenging times (**Chart G**).

The Bank of England has stress tested banks against extremely severe economic scenarios. In 2014, the scenario used to stress test the major UK banks included an abrupt slowing in capital flows, a fall in the sterling exchange rate index of 30%, falls in residential and commercial property prices of around 35% and 30% respectively, around a 3.75 percentage point increase in Bank Rate to anchor inflation expectations, a severe recession and around a 4.5 percentage point increase in unemployment. The 2015 stress-test scenario was based around a severe downturn in emerging market economies, Europe and the global economy, and a squeeze on net interest income as Bank Rate was cut to zero. That test led to losses twice as large as those incurred in the global financial crisis.

Chart G Capital positions have improved

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.

By the end of each test, it was confirmed that the UK banking system would have the capacity to continue lending to the real economy under such stresses.

This resilience is demonstrated by market moves since the referendum. Although bank equity prices have fallen sharply, reflecting new perceptions of the economic outlook and prospects for bank profitability, bank funding costs remain significantly lower than during previous episodes in which bank equity prices have fallen sharply (**Table 1**). This should reduce the pressure on banks to tighten credit conditions.

Table 1 Market indicators are not as pronounced as in previous episodes of stress

Market indicators[a][b]

	Global financial crisis	Euro sovereign debt crisis	Previous *Report*	23 June 2016	1 July 2016
Price to book ratio[c]	0.35	0.43	0.83	0.72	0.58
Additional Tier 1	–	–	451	627	719
Senior CDS	222	319	59	99	123
Senior unsecured bond	368	322	50	76	96
Covered bond	218	127	5	8	12

Sources: Bank of England, Bloomberg, Markit Group Limited and Bank calculations.

(a) The footnotes to **Chart B.3** on page 18 also apply here.
(b) Funding spreads are measured in basis points.
(c) Relates the share price with the book, or accounting, value of shareholders' equity per share.

The regulatory framework

The outlook for financial stability is also supported by the **United Kingdom's regulatory framework for financial services, which allows the system to draw upon its capital and liquidity buffers**, as needed, to maintain the provision of financial services. This means that shocks to the economic and financial environment can be cushioned, rather than amplified, by the system.

Nothing in financial regulation has changed as a result of the referendum. It will not change until the process of the United Kingdom's withdrawal from the European Union is complete, and until EU law ceases to have effect in the United Kingdom. The Bank is continuing to implement the current regulatory framework until any new arrangements with the European Union take effect. That framework implements internationally agreed standards.

The framework provides that around half the level of capital that the largest banks are expected to hold in normal conditions should take the form of capital buffers that can absorb shocks in times of stress. The framework also provides for liquidity buffers that must, as with capital buffers, be maintained in normal conditions. These are supplemented by liquidity facilities from the Bank of England and other central banks. For commercial banks, the ability to draw down these buffers, if needed, allows them to continue to lend to UK households and businesses; for firms with investment banking functions, it allows them to continue to provide services that support the liquidity and functioning of core financial markets.

The FPC strongly expects that banks will continue to support the real economy, by drawing on buffers as necessary. This includes the countercyclical capital buffer, which for UK exposures is set by the FPC.

Extensive contingency planning

The resilience of the UK financial system has been further enhanced by the actions of the Bank of England, alongside other domestic authorities and international authorities, and financial companies themselves, to put **extensive contingency plans** in place, including through supervision by the PRA. The measures will continue to support institutional resilience and market functioning during the period of heightened uncertainty. The FPC was briefed on, and reviewed, these plans in advance of the referendum.

In March, the Bank of England announced measures to provide additional sterling liquidity to banks, building societies and broker-dealers around the referendum, through three additional indexed long-term repo operations.

Eligible counterparties have positioned collateral with the Bank of England that creates the capacity to access more than £250 billion of additional funds through the Bank's normal operations and facilities. On 30 June, the Bank announced that it will continue to offer indexed long-term repo operations on a weekly basis until end-September 2016. The Bank is also able to provide substantial liquidity in foreign currency, if required, using existing swap lines in place with the Federal Reserve, the European Central Bank and other central banks.

Market functioning was also supported by the operational resilience of central counterparties and their management of financial risks using collateral calls from clearing members. Clearing of trades has not been disrupted and has been resilient to the record volumes of trading seen following the referendum. The ability of banks to meet margin calls through buffers of liquid assets has been assessed.

Challenges to the outlook for financial stability

The FPC judges that the current outlook for financial stability is challenging. It is monitoring closely the risks of:

Further deterioration in investor appetite for UK assets. During a prolonged period of heightened uncertainty, the risk premium on UK assets could rise further and overseas investors could continue to be deterred from investing in the United Kingdom. Persistent falls in capital inflows would be associated with further downward pressure on the exchange rate and tighter funding conditions for UK borrowers.

Adjustments in commercial real estate markets tightening credit conditions. Any adjustment in CRE markets could potentially be amplified by the behaviour of leveraged investors and investors in open-ended commercial property funds. Although they have a range of measures to manage stressed levels of redemptions, these open-ended funds could be forced to sell illiquid assets to meet redemptions if conditions persist beyond funds' notice periods. Any such amplification of market adjustments could affect economic activity by reducing the ability of companies that use commercial real estate as collateral to access finance.

Increasing numbers of vulnerable households and procyclical behaviour of buy-to-let investors. Since their implementation in 2014, the FPC's Recommendations on owner-occupier mortgage underwriting standards have guarded against a sharp increase in the proportion of households that are very highly indebted. However, the ability of some households to service their debts would be challenged by a period of weaker employment and income growth. These vulnerable households could affect broader economic activity by cutting back sharply on expenditure in order to continue to service debts. In March, the FPC welcomed the PRA's Supervisory Statement on underwriting standards in the buy-to-let market. The Committee is monitoring the

behaviour of buy-to-let investors, which has the potential to amplify movements in the housing market.

The outlook for the global economy. The FPC has previously highlighted the risks from rapid credit growth in China. Though policy stimulus measures look to have stabilised the economy in the near term, that has been associated with even more rapid growth of credit, increasing financial fragility over the medium term. This could have potentially significant spillovers to emerging market economies (EMEs) and the global economy more broadly. Diminished global risk appetite and a further appreciation of the US dollar could also bring vulnerabilities associated with high, and growing, levels of debt in a number of EMEs into sharper relief. Although spillovers to date have not been widespread, a prolonged period of uncertainty associated with the referendum could affect the global economy, particularly the euro area. The euro area accounts for around two fifths of the United Kingdom's trade and around one third of UK foreign direct investment. Major UK banks' exposure to the euro area amount to around 200% of their core equity capital.

Reduced and fragile liquidity in core financial markets. Further adjustment of market prices is possible, with the potential for a material rebalancing of investor portfolios. This could test the liquidity of core financial markets. In such an environment, prices could tend to move discontinuously and overshoot in response to shocks. An abrupt rise in liquidity premia would amplify adjustments in market prices and tighten credit conditions for UK corporate borrowers. The FPC has reviewed developments in market liquidity, including in the context of its review of the FPC Direction on a leverage ratio requirement and buffers (see Box 2).

Actions by the Financial Policy Committee

Having consistently built the resilience that is necessary for the system to face this challenging outlook, the FPC stands ready to take actions that will ensure that capital and liquidity buffers can be drawn on as necessary to support the supply of credit and market functioning, and thereby promote financial stability. At policy meetings on 28 June and 1 July:

- The FPC reduced the UK countercyclical capital buffer rate from 0.5% to 0% of banks' UK exposures with immediate effect. Absent any material change in the outlook, and given the need to give banks the clarity necessary to facilitate their capital planning, the FPC expects to maintain a 0% UK countercyclical capital buffer rate until at least June 2017. This action reinforces the FPC's view that all elements of the substantial capital and liquidity buffers that have been built up by banks are able to be drawn on, as necessary. It will reduce regulatory capital buffers by £5.7 billion, raising banks' capacity for lending to UK households and businesses by up to £150 billion.
- The FPC welcomed the Bank of England's announcement that it will continue to offer indexed long-term repo operations on a weekly basis until end-September 2016. This is a precautionary step to provide additional flexibility in the Bank's provision of liquidity insurance, further reinforcing the ability of firms to draw on their own liquidity buffers.
- The FPC supported the position of the PRA to allow insurance companies to use the flexibility in Solvency II regulations to recalculate transitional measures. These measures smooth the impact of those regulations. Without them, the regulations, which came into force in January, would tighten regulatory constraints on insurance companies following sharp falls in market interest rates. At the margin, the recalculation of transitional measures is likely to reduce immediate pressure on insurance companies to sell corporate securities and other risky assets.

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
Countercyclical capital buffer

The FPC is reducing the UK countercyclical capital buffer rate from 0.5% to 0% of banks' UK exposures with immediate effect. Absent any material change in the outlook, and given the need to give banks the clarity necessary to facilitate their capital planning, the FPC expects to maintain a 0% UK countercyclical capital buffer rate until at least June 2017.

This action reinforces the FPC's view that all elements of the substantial capital and liquidity buffers that have been built up by banks are able to be drawn on, as necessary, to allow them to cushion shocks and maintain the provision of financial services to the real economy, including the supply of credit and support for market functioning.

It will reduce regulatory capital buffers by £5.7 billion. For a banking sector that, in aggregate, targets a leverage ratio of 4%, this raises their capacity for lending to UK households and businesses by up to £150 billion.

In March, the FPC had begun to supplement regulatory capital buffers with the UK countercyclical capital buffer. This reflected its assessment that the risks the system could face were growing and additional capital was needed that could be released quickly in the event of an adverse shock.

At that time, the FPC judged that risks associated with domestic credit were no longer subdued, as they had been in the period following the financial crisis, and global risks were heightened. The Committee raised the UK countercyclical capital buffer rate to 0.5% and signalled its expectation that it would increase it further, to 1%, if the risk level remained unchanged.

As set out in this *Report*, a number of economic and financial risks are materialising. The FPC strongly expects that banks will continue to support the real economy, by drawing on buffers as necessary.

Consistent with the FPC's leverage ratio framework, the countercyclical leverage ratio buffer rate will also fall.

The Committee's decision in March to raise the UK countercyclical capital buffer rate to 0.5% was due to take effect formally from 29 March 2017. However, as the Committee explained in March, there is an overlap between the risks captured by existing PRA supervisory capital buffers and a positive UK countercyclical capital buffer rate of 0.5%.

The PRA Board concluded in March 2016 that, to ensure there is no duplication in capital required to cover the same risks, existing PRA supervisory buffers of PRA-regulated firms should be reduced, as far as possible, to reflect a UK countercyclical capital buffer rate of 0.5%, when such a rate came into effect.

The FPC has therefore accompanied its decision to reduce the UK countercyclical capital buffer rate with a Recommendation to the PRA that it bring forward this planned reduction in PRA supervisory capital buffers.

Recommendation: **The FPC recommends to the PRA that, where existing PRA supervisory buffers of PRA-regulated firms reflect risks that would be captured by a UK countercyclical capital buffer rate, it reduce those buffers, as far as possible and as soon as practicable, by an amount of capital which is equivalent to the effect of a UK countercyclical capital buffer rate of 0.5%.**

The PRA Board has agreed to implement this Recommendation. This means that three quarters of banks, accounting for 90% of the stock of UK economy lending, will, with immediate effect, have greater flexibility to maintain their supply of credit to the real economy. Other banks will no longer see their regulatory capital buffers increase over the next nine months, increasing their capacity to lend to UK households and businesses too.

Consistent with this, the FPC supports the expectation of the PRA Board that firms do not increase dividends and other distributions as a result of this action.

Box 2
Market liquidity and review of leverage Direction

In advance of the referendum the FPC had reviewed developments in market liquidity (see Developments in market liquidity chapter). Over the past year, government and corporate bond markets, including in the United Kingdom, have shown signs of reduced liquidity, and activity in repo markets has fallen materially. Some measures of the compensation investors require for liquidity risk have picked up. These reductions in market liquidity probably, in part, reflect post-crisis regulations as firms adjust their risk management and business models. The FPC judges that these regulations remain materially beneficial because of their contribution to the resilience of these markets and to financial stability more broadly.

However, the FPC judged that some market developments motivated careful review and consideration of whether there are possible refinements that would promote market effectiveness without compromising the resilience of the core system. In that context, the FPC has completed the annual review of its Direction to the PRA regarding leverage requirements for major banks and building societies (see the FPC Direction on a leverage ratio requirement and buffers chapter).

The Committee is reminding banks that the requirements are intended to be applied only at consolidated level. It is also responding to the Basel Committee's consultation on international leverage ratio standards. The FPC judges that there would be merit in these standards amending the current definition of total exposures in two respects: netting of cash receivables and cash payables from unsettled sales of securities; and allowing initial margin posted by clients to reduce dealers' potential future exposures to a default of those clients in centrally cleared derivatives transactions.

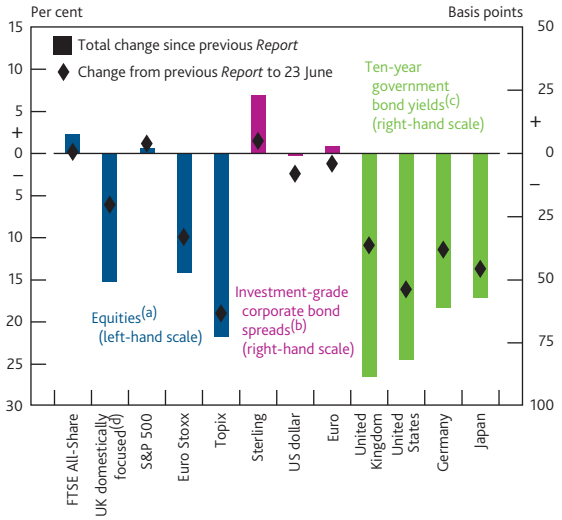
The Committee is further calling on the Basel Committee to review carefully the possible unintended effects of forthcoming international leverage ratio standards on the ability of the banking system to cushion shocks and to draw on central bank liquidity facilities as necessary. The FPC intends to keep under review the possible effects of including holdings of central bank reserves in measures of exposures used to calculate banks' leverage ratios.

Financial market fragility

Global financial markets have experienced significant volatility since the December 2015 *Report*. This has been particularly pronounced following the EU referendum, with sterling experiencing its largest two-day fall against the dollar in the post-Bretton Woods era. Risk premia on UK assets have also increased, with falls in equity prices and rises in corporate bond spreads. Long-term risk-free interest rates have fallen. Markets have appeared to function well following the referendum, with no apparent impairment of price discovery. But further adjustment of market prices is possible, with the potential for a material rebalancing of investor portfolios. Order flow imbalances could lead to higher liquidity premia in a range of assets, amplifying adjustments in market prices.

Chart A.1 Risky asset prices and government bond yields fell across advanced economies following the outcome of the EU referendum

Changes in equity indices, investment-grade corporate bond spreads and ten-year government bond yields since the December 2015 *Report*



Sources: Bank of America Merrill Lynch Global Research, Bloomberg, Thomson Reuters Datastream and Bank calculations.

(a) Denominated in units of local currency.
(b) 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.
(c) Government bond yields to maturity.
(d) Companies are categorised using annual financial accounts data on their geographic revenue breakdown. UK domestically focused companies are defined as those generating at least 70% of their revenues in the United Kingdom.

Global financial markets have experienced significant volatility, which was particularly pronounced following the EU referendum…

Since the December 2015 *Report*, global financial markets have experienced significant volatility. Equity indices have fallen substantially in some markets (**Chart A.1**). Sterling and euro-denominated investment-grade corporate bond spreads have risen, and ten-year government bond yields have fallen by between 50 and 90 basis points. As **Chart A.1** shows, a substantial element of these moves occurred after the referendum, indicating that the United Kingdom's decision to leave the European Union was seen as affecting the outlook for the global economy, particularly in the euro area (see Global environment chapter).

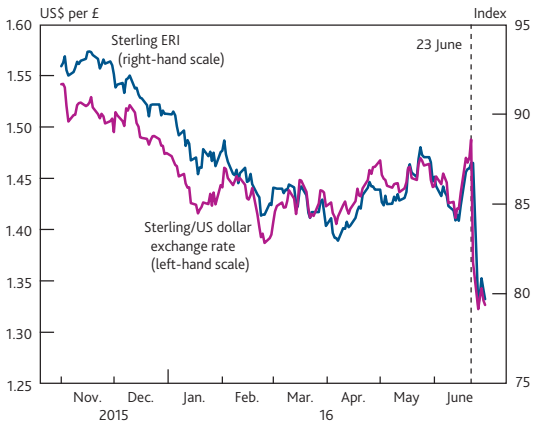
…with marked falls in a range of UK assets, and heightened uncertainty internationally.

Between 23 June and 1 July, the sterling exchange rate index fell by 9% (**Chart A.2**), and short-term volatility of sterling against the dollar rose to its highest level in the post-Bretton Woods era. These moves reflect an increase in risk premia on UK assets, a perceived weaker growth outlook, and anticipation of some future deterioration in the United Kingdom's terms of trade and supply capacity.

The FTSE All-Share equity index is broadly unchanged over the period, but components of the index have fallen sharply. Equity prices of UK banks have fallen on average by 20% (see Banking sector section) and of domestically focused companies by 10% (**Chart A.3**). Sterling investment-grade and high-yield corporate bond spreads rose by 18 and 100 basis points respectively. However, for investment-grade corporate borrowers, this rise in funding spread has been more than offset by falls in risk-free interest rates. Between 23 June and 1 July, the ten-year UK government bond yield and sterling investment-grade bond yields fell by 52 and 26 basis points respectively.

Chart A.2 Sterling fell sharply as the referendum result became clear

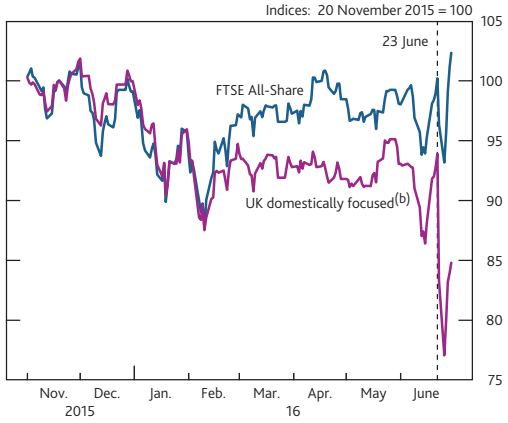
Sterling exchange rates



Source: Bloomberg.

Chart A.3 UK equity markets fell sharply following the referendum, with domestically focused companies particularly affected

Changes in UK equity prices since the December 2015 *Report*[a]

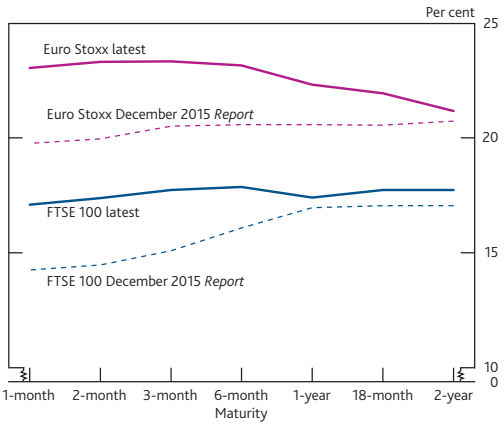


Sources: Bloomberg, Thomson Reuters Datastream and Bank calculations.

(a) Denominated in units of local currency.
(b) Companies are categorised using annual financial accounts data on their geographic revenue breakdown. UK domestically focused companies are defined as those generating at least 70% of their revenues in the United Kingdom.

Chart A.4 There is increased uncertainty around the future level of financial market prices

Term structure of implied volatility in equity markets[a][b]



Source: Bloomberg.

(a) Series show annualised option-implied volatility, as derived from the prices of options at various maturities.
(b) Euro Stoxx series refer to options on the Euro Stoxx 30 index.

There is increased uncertainty around the future level of asset prices, both in the United Kingdom and internationally. Market-implied measures of uncertainty have risen, including at longer horizons (**Chart A.4**).

Markets have appeared to function well following the referendum…

During a period of heightened market volatility, financial market functioning could be tested. As outlined in the July 2015 *Report*, some markets appear to have become more fragile over the past couple of years, as evidenced by episodes of short-term volatility and illiquidity.

Following the referendum, electronically traded markets (such as foreign exchange and equity markets) proved resilient to volumes of transactions much higher than their normal levels. And secured lending ('repo') markets — in which activity has fallen materially in recent years (see Market-based finance section), and upon which some leveraged investors rely as a source of finance — also proved resilient. The volume of transactions in short-term gilt repo markets was below, but close to, its average daily level since 2016.

At the same time, activity in some dealer-intermediated markets, including corporate and UK government bond markets, was subdued, but appeared to be largely orderly. For example, depth in government bond markets declined in the run-up to the day of the referendum, and fell sharply on the following day (**Chart A.5**). Around the same time, bid-offer spreads on UK government bonds widened (**Chart A.6**).

…but the liquidity of core markets remains potentially fragile.

But further adjustment of market prices is possible, with the potential for a material rebalancing of investor portfolios. Order flow imbalances could lead to higher liquidity premia in a range of assets, amplifying adjustments in market prices.

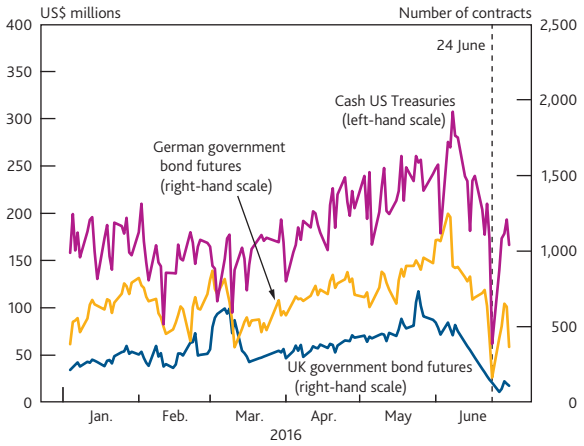
In recent years, dealers' holdings of corporate securities have fallen (see Market-based finance section). A future increase in demand for liquidity services could exceed the ability and willingness of dealers to build inventories, leading to a discount in market prices. Such an increase in demand could result from, for example, a change in overseas investors' appetite to hold UK assets.

A sustained period of illiquidity could result in a loss of confidence in financial markets' ability to support funding to the real economy or facilitate the transfer of risks. This could tighten credit conditions for UK companies, who have become more reliant on market-based sources of finance since the crisis (see Market-based finance section).

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

Chart A.5 Depth in government bond markets fell in the run-up to, and following, the referendum

Market depth in ten-year government bond markets[a]

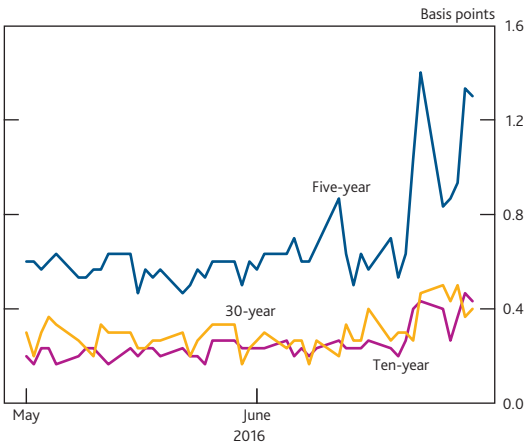


Sources: Brokertec, Eurex, ICEU and JPMorgan Chase & Co.

(a) Measured as the volume available to transact at the three best bid and ask prices, averaged daily. US series refers to the benchmark ten-year government bond in the cash market. UK and German series refer to the benchmark ten-year government bond in the respective futures markets.

Chart A.6 Bid-offer spreads in UK government bond markets increased in the lead up to the referendum

Bid-offer spreads in UK government bond markets[a]



Sources: Bloomberg and Bank calculations.

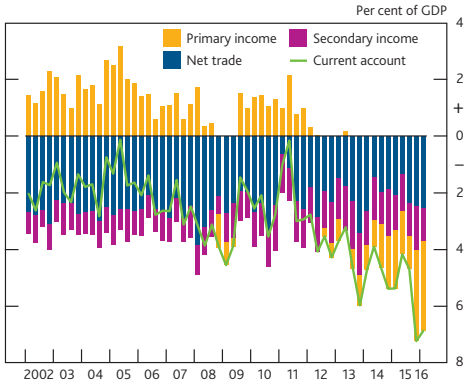
(a) Series show difference in end-of-day bid and ask yields, averaged over three gilts with maturities of around five, ten and 30 years.

UK current account

The United Kingdom's current account deficit is high by historical and international standards. The financing of the deficit is reliant on continuing material inflows of portfolio and foreign direct investment, which have been used to finance the public sector deficit and corporate investment, including in commercial real estate. In the run-up to the referendum, there were signs that foreign portfolio inflows into UK equities had slowed. During a prolonged period of heightened uncertainty, the risk premium on UK assets could rise further and overseas investors could continue to be deterred from investing in the United Kingdom. Persistent falls in capital inflows would be associated with further downward pressure on the exchange rate and tighter funding conditions for UK borrowers.

Chart A.7 The UK current account deficit is high by historical and international standards

Decomposition of the UK current account[(a)]

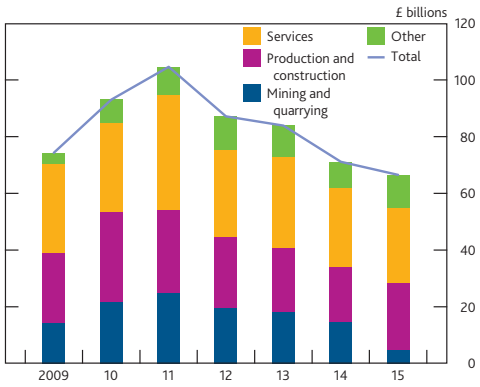


Sources: ONS and Bank calculations.

(a) Primary income mainly consists of compensation of employees and net investment income. Secondary income consists of transfers.

Chart A.8 Depressed mining and quarrying income is one factor weighing on UK FDI earnings

Nominal earnings on outward FDI[(a)]



Sources: ONS and Bank calculations.

(a) The total is taken from latest ONS series published on 30 June 2016. The industrial split is based on data published alongside ONS article, '*An analysis of the drivers behind the fall in direct investment earnings and their impact on the UK's current account deficit*', March 2016.

The UK current account deficit remains high by historical and international standards…

The current account deficit narrowed slightly from a record 7.2% of GDP in 2015 Q4 to 6.9% in 2016 Q1 (**Chart A.7**), but it remains high by historical and international standards. The widening of the deficit since 2011 has predominately been driven by a sharp deterioration in the primary income balance, which fell from 1.0% of GDP in 2011 Q4 to -3.1% in 2016 Q1. The UK trade deficit has remained broadly stable over the same period.

The weakness in primary income, which largely consists of net investment income, has been mainly due to weaker foreign direct investment (FDI) earnings. Since 2011, UK-residents' earnings on their outward FDI have fallen substantially, while foreigners' earnings on their inward UK FDI have been comparatively stable. While the fall in earnings on outward FDI has been relatively broad-based across the main industrial sectors, the weakness in the mining and quarrying sector has been particularly pronounced, explaining around half of the total fall in UK earnings on outward FDI since 2011 (**Chart A.8**). This has coincided with lower oil and other commodity prices.

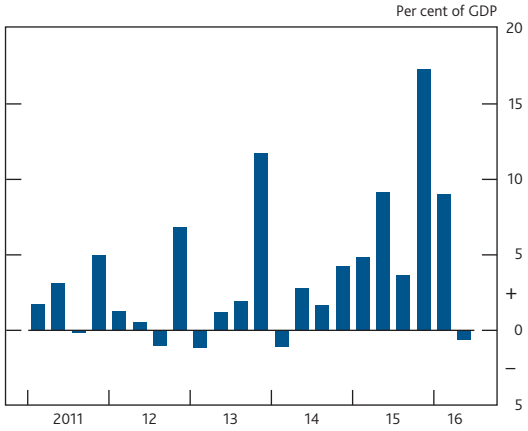
The recent fall in the value of sterling should have the effect of narrowing the current account deficit. For example, it should have a positive impact on the United Kingdom's net investment income, as receipts on foreign-currency denominated assets will be worth more.

…and remains a potential source of fragility, particularly in the light of economic uncertainty.

The financing of the deficit is reliant on continuing material inflows of portfolio investment and FDI, which have been used

Chart A.9 Purchases of UK equities by foreign investors appear to have fallen in the run-up to the EU referendum

Changes in non-resident net holdings of FTSE 100 shares[a][b][c]



Sources: S&P Global Market Intelligence and Bank calculations.

(a) Quarterly net changes in non-resident holdings of FTSE 100 companies' shares, as listed on the index at 23 June 2016.
(b) The change in the holding of shares are weighted at each quarterly period by the price of the underlying stock. These data are updated on the date in which a change in shareholding is formally registered, not the date when the transaction itself takes place, which may be earlier. Data are non seasonally adjusted.
(c) The S&P's disclaimer of liability, which applies to the data provided, is available at www.bankofengland.co.uk/publications/Documents/fsr/2016/fsr16jul2.xlsx.

Table A.1 FDI and portfolio investment flows have been the main sources of inward investment since 2011

Financing flows behind the current account deficit

Per cent of GDP	Inward investment (net acquisition of foreign liabilities by UK residents)		Outward investment (net acquisition of foreign assets by UK residents)		Net inward financing flow[a]	
	2016 Q1	2011–15 average	2016 Q1	2011–15 average	2016 Q1	2011–15 average
Direct investment	8.1	1.8	-4.8	-0.2	12.9	2.1
Portfolio investment[b]	-2.5	3.6	-9.6	1.4	7.0	2.2
Other investment[c]	-7.1	-4.4	-2.4	-3.8	-4.7	-0.6
Total[d]	-1.5	1.0	-8.7	-2.7	7.1	3.7

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. The total net inward financing flow is equal in magnitude to the current account deficit (plus net errors and omissions).
(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 sum of the components may not equal the total, as financing flows for reserves and net derivatives are excluded.

to finance the public sector deficit and corporate investment, including in commercial real estate.

In the run-up to the referendum, there were signs that foreign portfolio inflows into UK equities had slowed. Data on non-resident holdings of FTSE 100 shares show a sharp reduction in purchases of UK equities in 2016 Q2 (**Chart A.9**). And the Bank of America Merrill Lynch Global Fund Manager Survey suggested that fund managers reduced their allocation into UK equities in Q2, with the balance of asset managers reporting they are underweight UK equities in May reaching its highest point since 2008.

Following the referendum, sterling experienced its largest two-day fall against the dollar in the post-Bretton Woods era. Risk premia on UK assets have increased. This would be consistent with a reduction in the willingness of foreign investors to hold sterling assets. Persistent falls in capital inflows would be associated with further downward pressure on the exchange rate and tighter funding conditions for UK borrowers.

An abrupt reduction in the willingness of foreign investors to engage in new investment could also have a severe impact on asset markets in which foreign investors account for a substantial proportion of transactions. Since 2013, overseas companies have accounted for roughly half of UK commercial real estate transactions, making this sector particularly vulnerable to a change in investor preferences. In 2016 Q1, the volume of transactions involving foreign investors fell by almost 50% relative to the previous quarter, driving a slowdown in overall market transactions (see UK commercial real estate chapter).

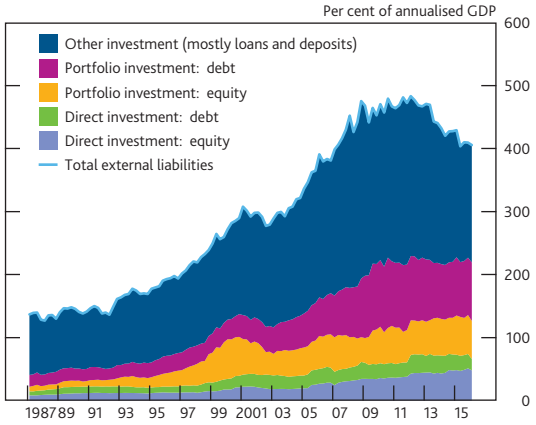
The composition of recent capital flows has not been associated with a build-up of external refinancing risks…

Although the large current account deficit exposes the United Kingdom to the risk that capital inflows could slow sharply, the risk of a reversal causing external refinancing difficulties for UK borrowers is considerably smaller. Two factors contribute to that. First, the composition of recent capital flows has not been associated with a build-up of external refinancing risks. Second, refinancing risks associated with the United Kingdom's large external stock of debt are mitigated by UK banks' access to alternative sources of funding and holdings of liquid asset buffers.

Since 2011, the main sources of capital inflow have been 'stickier' forms of finance. FDI and portfolio investment flows have been the main sources of inward investment (**Table A.1**). Of the latter, over half have been foreign purchases of gilts, which tend to have long maturities. And around 20% have been foreign purchases of equity securities, which are not subject to refinancing risk.

Chart A.10 The United Kingdom's external liabilities as a share of GDP have fallen since the financial crisis

UK gross external liabilities by type[a]

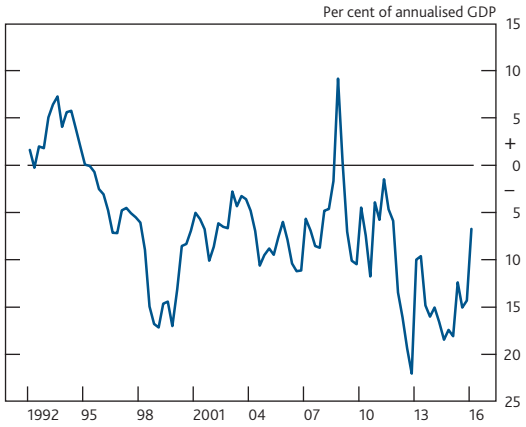


Sources: ONS and Bank calculations.

(a) Derivatives are excluded.

Chart A.11 The United Kingdom's net foreign asset position has been improving

The United Kingdom's net international investment position (NIIP)[a][b]



Sources: ONS and Bank calculations.

(a) The UK NIIP measures the difference between the United Kingdom's external assets and external liabilities. Data are non seasonally adjusted.
(b) Estimates of the United Kingdom's NIIP are uncertain. The estimate published by the ONS does not incorporate revaluation effects on the foreign direct investment (FDI) assets and liabilities. According to Bank calculations, updating the book value of FDI suggests that the United Kingdom's NIIP may be large and positive. For further details see the May 2014 *Inflation Report*, pages 22–23; www.bankofengland.co.uk/publications/Documents/inflationreport/2014/ir14may.pdf.

…and there are mitigating factors to refinancing risks stemming from the United Kingdom's stock of external debt.

Refinancing risks stemming from the stock of UK external liabilities have decreased since the crisis, as both the stock of external assets and liabilities has fallen. Nevertheless, the United Kingdom continues to maintain a large stock of external liabilities, with a significant proportion of those liabilities potentially vulnerable to refinancing risk. In 2016 Q1, other investment, which is mostly comprised of short-term loans to and deposits with UK-resident banks, and portfolio investment in the form of debt securities are estimated to have totalled around 185% and 90% of annual GDP respectively (**Chart A.10**).

But there are factors mitigating refinancing risks, particularly those associated with the banking sector. First, less than 25% of UK external liabilities classified as other investment belong to UK-owned banks, with around 50% of other investment liabilities belonging to UK-resident branches and subsidiaries of foreign-owned banks. Some of these liabilities are likely to reflect intragroup transactions and these entities may be able to draw on the resources of their parent companies in the event that refinancing risk crystallises. Second, the extent and nature of banks' short-term liabilities, including those to foreign holders, directly affects the quantity of liquid assets UK banks are required to hold by the PRA. So the more exposed they are to refinancing risk, the greater the safety buffer they should have in place. Third, UK banks have access to more than £250 billion of additional funds through the Bank of England's normal liquidity operations and facilities.

The currency composition of the United Kingdom's external balance sheet does not amplify risks associated with a sterling depreciation.

Currency mismatches in a country's external balance sheet can amplify risks associated with a large current account deficit, if a depreciation of the currency leads to a deterioration of the external balance sheet position.

Although there are no official statistics on the currency composition of the United Kingdom's external balance sheet, estimates suggest that around 60% of the stock of external liabilities is denominated in foreign currency, compared with more than 90% of the stock of external assets.[1] This means that, other things equal, a fall in the value of sterling should increase the value of external assets relative to liabilities, improving the United Kingdom's net foreign asset position which was -6.7% of annualised GDP in 2016 Q1 (**Chart A.11**).

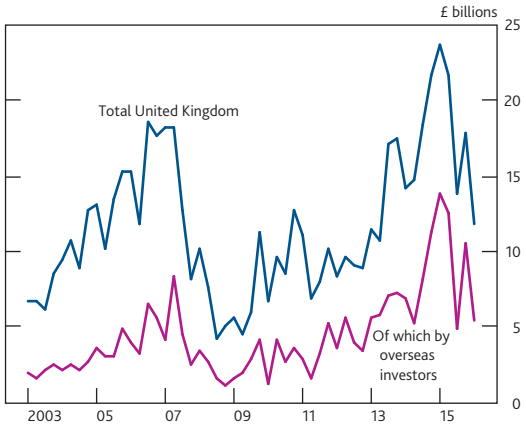
The FPC is monitoring all forms of capital inflow and risk premia on a range of UK assets. It judges that, during a prolonged period of heightened uncertainty, there is a risk that overseas investors could continue to be deterred from investing in the United Kingdom.

(1) See Bénétrix, A, Lane, P and Shambaugh, J (2015), 'International currency exposures, valuation effects and the global financial crisis', *Journal of International Economics*, Elsevier, Vol. 96(S1), pages S98–S109 and accompanying data; www.philiplane.org/BLSJIE2015data.xls.

UK commercial real estate

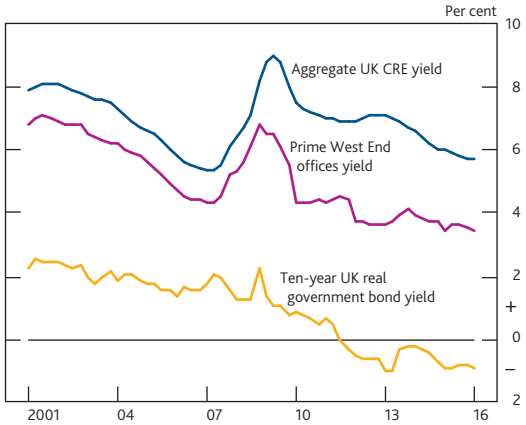
The UK commercial real estate (CRE) market has experienced strong inflows of capital from overseas over recent years. Foreign investors accounted for around 45% of the value of total transactions since 2009. These inflows fell by almost 50% in the first quarter of 2016. Some of this is likely to reflect uncertainty ahead of the EU referendum, but may also reflect an adjustment after valuations in some segments of the market, notably the prime London market, had become stretched. Since the referendum, share prices of UK real estate investment trusts have fallen sharply, highlighting the risk of future adjustments in CRE prices. Any adjustment in CRE markets could be amplified by the behaviour of leveraged investors and investors in open-ended commercial property funds. Any such amplification of market adjustments could affect economic activity by reducing the ability of companies that use CRE as collateral to access finance.

Chart A.12 CRE transactions fell in early 2016
UK CRE transactions (gross quarterly flows)



Sources: The Property Archive and Bank calculations.

Chart A.13 CRE yields have continued to fall
CRE and government bond yields



Sources: Bloomberg, MSCI and Bank calculations.

Activity in the commercial real estate market has fallen sharply in recent months.

There has been a sharp slowdown in activity in the UK commercial real estate (CRE) market in the first half of 2016 (**Chart A.12**). In 2016 Q1, transactions fell by £6 billion, or 34%, relative to the previous quarter. This was largely driven by a fall in activity in London, where transactions fell by 53%. Monthly data suggest continued falls in April and May.

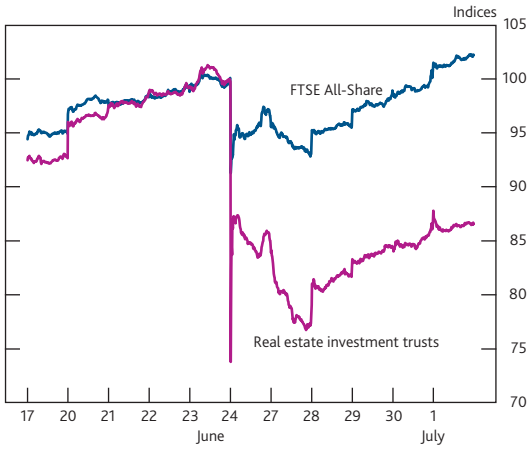
Market participants suggest that the slowdown in activity — especially in London — partly reflected increased uncertainty ahead of the EU referendum. For example, 80% of respondents to the 2016 Q1 RICS commercial survey of CRE investors thought 'uncertainty in the run-up to the EU referendum' had been reducing investment in the London market. Overseas investors, who have accounted for around 45% of the value of UK CRE transactions since the start of 2009, may be particularly sensitive to uncertainty associated with the United Kingdom leaving the European Union. CRE transactions by overseas investors fell by £5.1 billion, or 48%, in 2016 Q1 relative to the previous quarter (**Chart A.12**).

CRE prices were broadly flat in 2016 Q1. This follows a sustained period of strong growth, during which aggregate UK valuations have risen to a level around 40% higher than their lowest point in 2009. Rental yields had continued to fall in 2016 Q1 and were at their lowest levels since the crisis, at 5.8% for the United Kingdom as a whole (**Chart A.13**). Rental yields for prime London properties were particularly low, at 3.8%.

Spreads between CRE yields and long-term interest rates on government bonds were broadly in line with their historical

Chart A.14 Real estate investment trust share prices have fallen sharply following the referendum

Real estate investment trusts and FTSE All-Share indices, 17 June–1 July 2016[a]

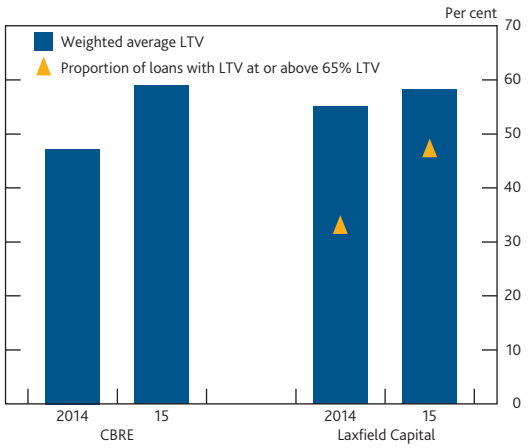


Sources: Bloomberg and Bank calculations.

(a) 100 = closing price on 23 June.

Chart A.15 Leverage in new CRE lending has increased

Loan to value ratios in new UK CRE lending according to data from two large loan advisors[a]

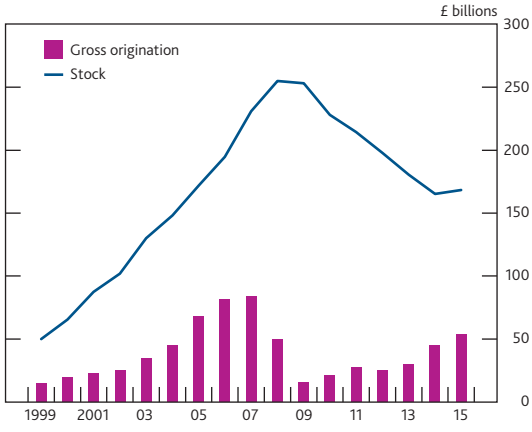


Sources: CBRE, Laxfield Capital and Bank calculations.

(a) Data are based on actual lending (CBRE) or loan requests (Laxfield Capital).

Chart A.16 Debt financing in UK CRE markets has been rising

UK CRE debt reported to De Montfort University survey



Source: De Montfort University.

averages in 2016 Q1. This suggests that valuations were consistent with normal growth rates of rental income in the future and standard levels of risk premia. Valuations were therefore vulnerable to higher risk premia and lower expectations of future rental growth. In the run-up to the referendum, expectations of rental growth had already begun to slow, with Investment Property Forum consensus forecasts for 2016 rental growth in the United Kingdom falling by 1 percentage point in the period since the December 2015 *Report*. Since the referendum, risk premia on a range of UK assets have increased (see Financial market fragility chapter). And the share prices of UK real estate investment trusts have fallen by 13% (**Chart A.14**), reflecting the risk of future marked adjustments in CRE prices.

Any stress in the market could be exacerbated by redemptions from open-ended funds…

The behaviour of open-ended funds investing in the UK CRE market could amplify any market adjustment. These funds offer investors the option of redeeming their investments at short notice. Although they have a range of measures to manage stressed levels of redemptions, these open-ended funds could be forced to sell illiquid assets to meet redemptions if conditions persist beyond funds' notice periods. Open-ended funds have accounted for an increasing share of CRE investment in recent years, and now have around £35 billion assets under management, representing around 7% of total investment in the UK CRE market. These funds had experienced significant outflows in the months leading up to the referendum, which appear to have increased following the result.

…and leverage in the sector.

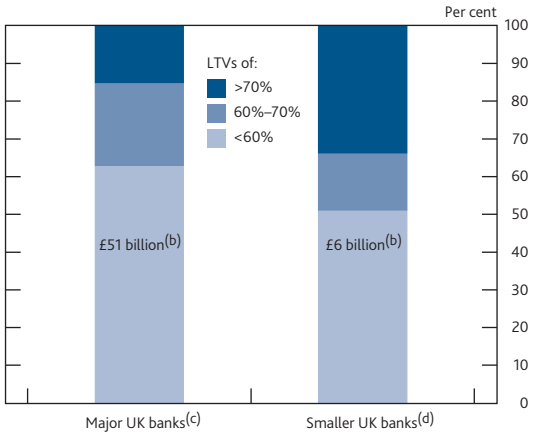
The use of leverage in CRE transactions is another potential source of amplification of price falls. Easier access to credit can push up prices in an upswing, while leveraged investors are more exposed to equity losses in a downswing. This higher exposure may increase their incentives to sell, amplifying any existing stress in the market. A range of market data sources indicate that loan to value (LTV) ratios on new lending to CRE firms have increased since 2014. Data from Laxfield Capital show the proportion of loan requests with LTV ratios at or above 65% rising from 33% to 47% in 2015 (**Chart A.15**). Increasing leverage in the sector resulted in the total stock of debt used to finance UK CRE investment increasing for the first time since the crisis in 2015, though it remains around 34% lower than its pre-crisis peak (**Chart A.16**).

The UK banking system has reduced its exposure to CRE since the crisis…

Major UK banks have material exposures to the CRE sector, averaging around 55% of their common equity Tier 1 capital at end-2015. These exposures have fallen since the crisis, with the stock of UK banks' CRE lending having halved in value over

Chart A.17 High-LTV CRE lending is more common among smaller banks

LTV distributions for the stock of UK lenders' CRE loans at end-2015 (excluding residential and development loans)[a]



Sources: Bank of England, Investment Property Databank (IPD UK), PRA and Bank calculations.

(a) For major UK banks, the LTV distribution is estimated using a stratified sample of loan-level data on banks' CRE portfolios at the end of 2013, loan-level data on their gross CRE lending in 2014–15, and CRE price indices. For smaller UK banks, the LTV distribution is from portfolio-level data as of end-2015.
(b) Value of total outstanding CRE loans (excluding development and residential loans).
(c) 'Major UK banks' covers Barclays, HSBC, Lloyds Banking Group, RBS and Santander UK, the largest UK CRE lenders within the major UK banks peer group.
(d) 'Smaller UK banks' includes banks and building societies with total assets under £50 billion.

that period. Data collected by the PRA suggest that major UK banks have broadly maintained their underwriting standards in recent years. In contrast, smaller banks and building societies, including challenger banks, have a relatively high proportion of more highly leveraged CRE loans on their books (**Chart A.17**).

Major UK banks' resilience to losses on CRE exposures was assessed in the 2014 and 2015 stress tests, both of which included severe downturns in the CRE market, with declines of around 30% in UK CRE prices.

…but stress in the CRE sector could reduce companies' access to finance, amplifying shocks to the real economy. An amplified adjustment in the CRE market could affect economic activity through the widespread use of CRE as collateral for corporate borrowing. According to a Bank of England review of bank lending to small and medium-sized companies, 75% of those UK companies that borrow from banks use CRE as collateral. Fluctuations in CRE prices therefore impact smaller companies' access to finance.

In an upswing, when prices are rising, companies should be able to secure more, or cheaper, credit against their commercial property. In a downswing, companies may be unable either to refinance existing debt or to borrow to invest in new productive opportunities — a tightening in conditions that might be particularly acute if prices fall below fundamental values. Research by Bank staff suggests that every 10% fall in UK CRE prices is associated with a 1% decline in economy-wide investment.[1]

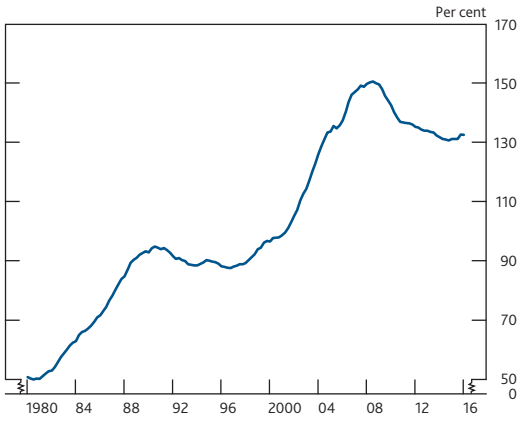
The FPC is focused on the potential for adjustments in the CRE market to be amplified and affect economic activity by reducing the ability of companies that use CRE as collateral to access finance. Any adjustment could potentially be amplified by the behaviour of leveraged investors and investors in open-ended funds. The Bank's 2016 stress test will assess major UK banks' resilience to a severe decline in CRE prices.

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

UK household indebtedness

Although it has fallen materially since the financial crisis, UK household indebtedness remains high by historical standards. Since their implementation in 2014, the FPC's Recommendations on owner-occupier mortgage underwriting standards have guarded against a sharp increase in the proportion of households that are very highly indebted. However, growth in buy-to-let lending and consumer credit has been strong over the past two years. The ability of some households to service their debts would be challenged by a period of weaker employment and income growth. These vulnerable households could affect broader economic activity by cutting back sharply on expenditure in order to continue to service debts.

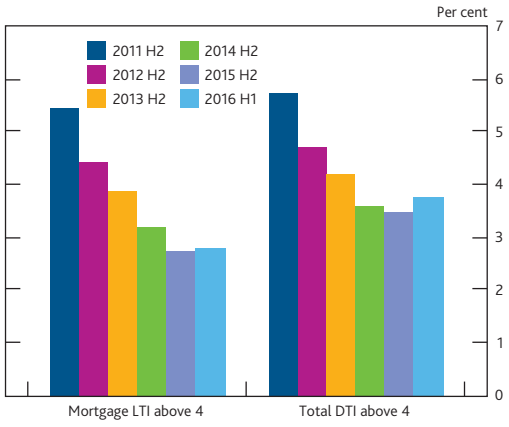
Chart A.18 Household indebtedness is elevated
UK household DTI ratio[a]



Sources: ONS and Bank calculations.

(a) Gross debt as a percentage of a four-quarter moving sum of disposable income. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM).

Chart A.19 The proportion of households with high DTI ratios has been declining in recent years
Percentage of households with mortgage LTI or total DTI ratios above 4



Sources: NMG survey and Bank calculations.

Household indebtedness is high, potentially amplifying risks to economic and financial stability.

After a prolonged period of retrenchment following the financial crisis, household debt began to rise relative to incomes in early 2015. In 2016 Q1, the aggregate household debt to income (DTI) ratio was 132% (**Chart A.18**). This is high by historical and international standards.

High levels of household debt may amplify risks to the financial system or wider economy. Highly indebted households are particularly vulnerable to unexpected events that increase the burden of servicing existing debts, such as an increase in interest rates or a fall in incomes. In response to shocks that increase their debt-servicing ratios (DSRs), vulnerable households may cut back sharply on other spending in order to continue servicing their debts, with adverse implications for economic activity. Alternatively, vulnerable households may default on their debts, testing the resilience of lenders.

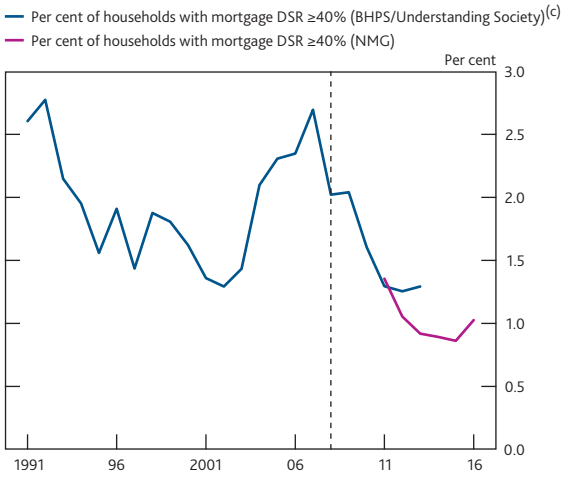
The proportion of households with high mortgage loan to income (LTI) and total DTI ratios declined in the four years to 2015 (**Chart A.19**). The proportion of households with high mortgage DSRs also declined in the same period. These declines have not continued in the first half of 2016.

Persistently low levels of borrowing rates have been supportive of debt-servicing costs (**Chart A.20**). But the ability of some households to service their debts would be materially affected in the event of weaker employment and income growth.

Rising household indebtedness has reflected growth in household credit. The annual growth rate of lending to households has risen in each quarter since 2013 Q2. This growth rate reached 4.1% in 2016 Q1, its highest level since

Chart A.20 Debt-servicing ratios have ticked up in 2016

Percentage of households with DSRs above 40%[a][b]

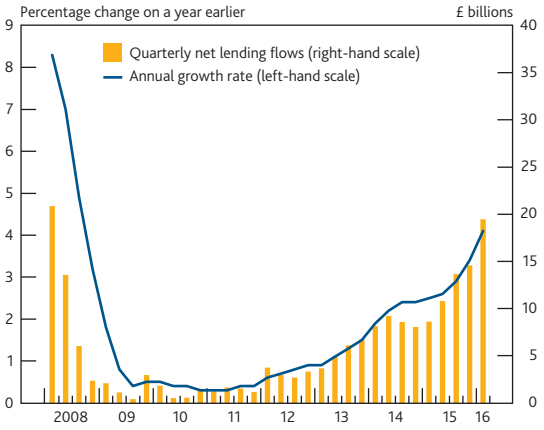


Sources: British Household Panel Survey (BHPS), NMG Consulting survey, Understanding Society and Bank calculations.

(a) Mortgage DSR calculated as total mortgage payments as a percentage of pre-tax income.
(b) 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. Results for 2016 are from the H1 survey, while those for previous years are from the H2 waves.
(c) BHPS/Understanding Society data to the left of the dashed line are from the BHPS (1991–2008), while data to the right are from Understanding Society (2009–13). BHPS/Understanding Society estimates exclude households for whom more than 1% of income is imputed.

Chart A.21 Lending growth to households has been increasing steadily

Total lending to individuals since 2008[a]



Source: Bank of England.

(a) Sterling lending by UK MFIs and other lenders to UK individuals (excluding student loans). Seasonally adjusted.

2008 (**Chart A.21**). Strong flows in the first quarter of 2016 were boosted by buy-to-let housing transactions that had been brought forward in anticipation of increases in stamp duty land tax for additional properties, which took effect from 1 April 2016. The stock of buy-to-let lending grew by 12.3% in the year to 2016 Q1. Activity fell off sharply in April, such that buy-to-let mortgage lending for house purchase was 85% lower than in March. Growth in consumer credit has also been particularly strong, in part reflecting strong growth in dealership car finance, as well as credit card lending. Consumer credit grew at an annual rate of 9.9% in May 2016. Together, buy-to-let and consumer credit lending have accounted for over 90% of the increase in the stock of lending to households over the past two years, despite making up only around a quarter of the total stock of household debt in 2016 Q1.

Risks from high indebtedness are being addressed.

In June 2014, the FPC took action to address risks from household indebtedness, via two Recommendations on owner-occupier mortgage underwriting standards:

- *Mortgage interest rate stress test*: 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.

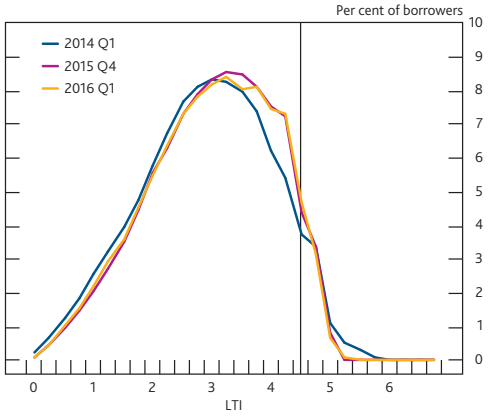
- *Loan to income flow limit*: the PRA and FCA should ensure that mortgage lenders do not extend more than 15% of their total number of new residential mortgages at loan to income ratios at or greater than 4.5.

In making these Recommendations, the FPC had judged that household indebtedness did not pose an imminent threat to financial stability, but that it was prudent to insure against the risk of a marked loosening in underwriting standards and a further significant rise in the proportion of vulnerable households.

The FPC remains alert to potential threats to financial stability arising from rapid growth in buy-to-let mortgage lending. The macroprudential risks centre on the possibility that buy-to-let investors could behave procyclically, amplifying cycles in the housing market as a whole. This behaviour could put upward pressure on household indebtedness in an upswing and have an impact on consumption and broader economic activity in a downturn, as well as affecting the resilience of the banking system and its capacity to sustain lending to the wider real economy in a stress. In March 2016, the PRA launched a consultation on underwriting standards in the buy-to-let mortgage market (see Box 3).

Chart A.22 There is evidence of increased 'bunching' of mortgage lending flows at LTI ratios just below 4.5

Distribution of owner-occupier mortgage flows by LTI[(a)]

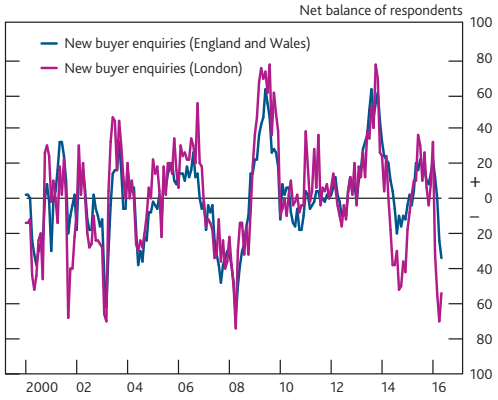


Sources: FCA Product Sales Database and Bank calculations.

(a) FCA Product Sales Database includes regulated mortgage contracts only. Loan to income (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.

Chart A.23 Recent uncertainty may have driven a fall in new buyer enquiries

New buyer enquiries[(a)]

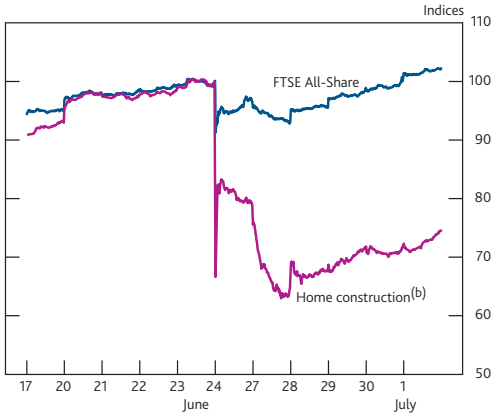


Source: Royal Institution of Chartered Surveyors (RICS).

(a) The percentage balance of respondents reporting an increase in new buyer enquiries over the past month less the percentage reporting reduced enquiries. Series are seasonally adjusted.

Chart A.24 Home builders' share prices have fallen sharply since the referendum

FTSE All-Share and home construction share indices, 17 June–1 July 2016[(a)]



Sources: Bloomberg and Bank calculations.

(a) 100 = closing price on 23 June.
(b) Market capitalisation weighted index of the eleven largest UK home builders in the FTSE 350 Household Goods and Home Construction Index.

There is evidence that the FPC's policies have restrained growth in the number of vulnerable households.

The FPC's policies appear to have affected the characteristics of new lending. The length of mortgage terms for high LTI borrowers has increased, and an increasing share of new lending is extended at terms that take borrowers to around a typical retirement age before full repayment is due. Thirty-three per cent of new mortgages now take borrowers to the age of 65 before full repayment is due, compared with 27% in 2014 Q1. For a given principal amount, a longer term reduces monthly repayments. This may suggest that lenders have been willing to meet higher demand for credit.

Growth in high LTI mortgage lending appears to have been restrained by the FPC's LTI flow limit. At around 9% in 2016 Q1, the aggregate share of new mortgage lending above the FPC's 4.5 LTI threshold remains well below the 15% limit set by the FPC, so it has not been binding in aggregate. Nevertheless, lenders have been reluctant to increase that share and there has been an increase in the proportion of new mortgages extended at LTI ratios just below 4.5 (**Chart A.22**). This is consistent with lenders restricting the extent to which credit growth rests on lending at the highest loan to income multiples.

The FPC is alert to risks arising from household indebtedness.

Survey evidence on the housing market has been difficult to interpret in recent months because of the impact of the pre-announced increase in stamp duty, which boosted activity in March and has dampened activity in April and May. Nevertheless, in advance of the referendum, there was evidence that uncertainty about the outcome was contributing to a slowdown in housing activity. For example, the May RICS survey of chartered surveyors reported a sharp decline in new buyer enquiries (**Chart A.23**) to their lowest level since 2008. In the period since the referendum, the average share price of the largest home construction firms has declined by 25%, compared with a 2% rise in the FTSE All-Share index (**Chart A.24**).

As the housing market evolves, the FPC is monitoring the behaviour of buy-to-let investors, which has the potential to amplify movements in the market.

The ability of some households to service their debts would be challenged by a period of weaker employment and income growth. The outlook for economic activity and employment has deteriorated. At its June meeting, the Monetary Policy Committee reported growing evidence that uncertainty about the referendum had led to delays to major economic decisions, which past evidence suggested could increase unemployment. There are early signs that these effects have continued since the referendum. The FPC is monitoring closely the number of potentially vulnerable households.

Box 3
Underwriting standards for buy-to-let mortgages

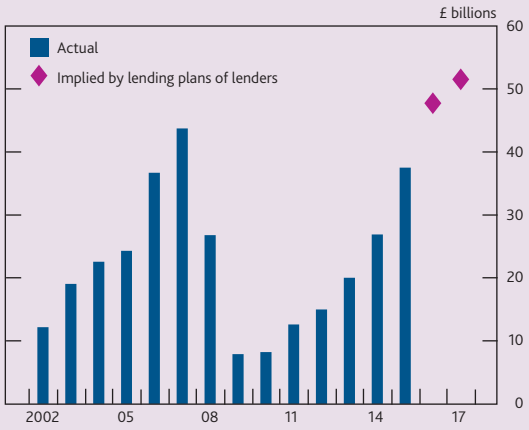
In March 2016, the PRA published a consultation on a draft Supervisory Statement setting out its expectations for underwriting standards in the buy-to-let mortgage market. The consultation closed on 29 June. This box summarises the background to, and proposals in, the draft Supervisory Statement, and the implications for macroprudential policy.

Background

Buy-to-let mortgage lending has driven mortgage lending growth in recent years. Seventeen per cent of the stock of total secured lending is now accounted for by buy-to-let mortgages, and the gross flow of buy-to-let lending in 2015 was close to its pre-crisis peak.

The PRA conducted a review of underwriting standards in the buy-to-let mortgage market between November 2015 and March 2016. It reviewed the lending plans of the top 31 lenders in the industry, who account for over 90% of total buy-to-let lending. A number of lenders planned to increase their gross buy-to-let lending significantly, with overall planned lending in the region of £50 billion (**Chart A**). Given competition in the sector, this strong growth profile raises the risk that firms could relax their underwriting standards in order to achieve their plans. The review further highlighted that some lenders were already applying underwriting standards that were somewhat weaker than those prevailing in the market as a whole.

Chart A Gross advances for buy-to-let lending



Sources: Council of Mortgage Lenders, firm lending plans and Bank calculations.

Details of the draft Supervisory Statement

The draft Supervisory Statement aims: to ensure that buy-to-let lenders adhere to a set of minimum expectations around underwriting standards; and, to prevent a marked loosening in underwriting standards. It also clarifies the regulatory capital treatment of certain buy-to-let exposures.

The minimum expectations that lenders should meet when underwriting buy-to-let mortgage contracts include:

- Affordability assessments should take into account the borrower's costs associated with letting the property, including tax liabilities.
- If lenders wish to use the borrower's personal income to support the mortgage payment, this should be verified.
- When assessing affordability, lenders should consider likely future increases in interest rates over the next five years. This should be based on: market expectations; a minimum increase of 200 basis points in buy-to-let mortgage interest rates; and any prevailing FPC Recommendation and/or Direction on the appropriate interest rate stress tests for buy-to-let lending. The stressed interest rate used is expected to be no lower than 5.5%, reflecting prevailing industry standards.
- Lending to 'Portfolio Landlords' (that is, those with four or more mortgaged buy-to-let properties) should be assessed using a specialist underwriting process.

Implications for macroprudential policy

At its March meeting, the FPC welcomed and supported the draft Supervisory Statement. The Supervisory Statement reflects microprudential objectives, aiming to reduce the risk that buy-to-let lenders make losses that can threaten their safety and soundness. From a macroprudential perspective, policies that prevent a slippage in buy-to-let underwriting standards should also reduce the threat of buy-to-let lending amplifying wider housing market risks. The FPC discussed that, although the 200 basis points increase in buy-to-let mortgage rates was lower than the interest rate stress applied to owner-occupied lending under the FPC's June 2014 Recommendation, lenders tended to assess affordability for buy-to-let mortgages using interest cover ratios of at least 125%. In addition, loan-to-value ratios at origination in excess of 75% were less common in buy-to-let mortgages than in owner-occupied mortgages. Buy-to-let loans therefore typically started with a larger equity cushion for lenders, which reduced the associated credit risk in the first few years of the loan given that these loans were typically non-amortising. The FPC considered that no action beyond this was warranted for macroprudential purposes at that time. It will continue to monitor developments and potential threats to financial stability from the buy-to-let mortgage market closely, and stands ready to take action.

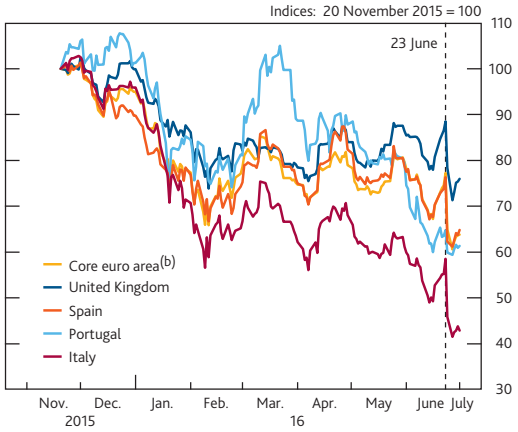
HM Treasury has prepared draft secondary legislation granting the FPC powers of Direction over buy-to-let lending (see Annex 1).

Global environment

Since the referendum, there has been a significant increase in volatility and risk premia in global financial markets. Although spillovers to date have not been widespread, a prolonged period of uncertainty could affect the global economy, particularly the euro area. This comes at a time when banks in some vulnerable euro-area countries are still working through legacy issues from the financial crisis. Diminished global risk appetite and a further appreciation of the US dollar could also bring vulnerabilities associated with high, and growing, levels of debt in a number of emerging market economies into sharper relief.

Chart A.25 UK and euro-area banks' equity prices have come under particular pressure

UK and euro-area bank equity indices[a]

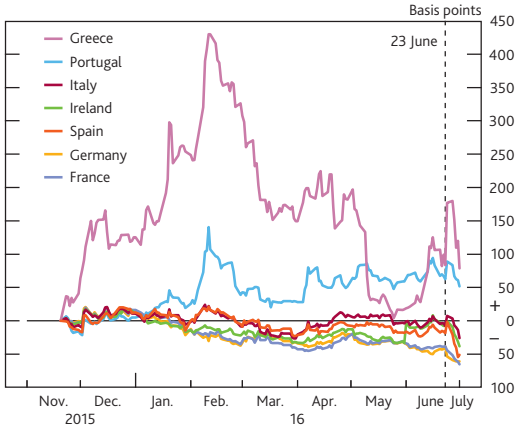


Sources: SNL Financial, Thomson Reuters Datastream and Bank calculations.

(a) Weighted by 2015 assets.
(b) Ten largest banks based on 2015 total assets in Austria, Belgium, France, Germany and the Netherlands.

Chart A.26 Euro-area government yields have fallen further since the referendum

Change in selected ten-year euro-area government bond yields since December 2015 *Report*



Sources: Thomson Reuters Datastream and Bank calculations.

There has been a renewed increase in global risk aversion…

Financial market volatility had been elevated around the turn of the year against a backdrop of rising global risk aversion and concerns about the outlook for emerging market economies (EMEs) and potential spillovers to advanced economies. The IMF in April revised down its baseline projection for world output growth in 2016 to 3.2%, a cumulative 0.4 percentage points lower than the October 2015 *World Economic Outlook* (*WEO*), led by downward revisions to growth in EMEs and advanced economies of 0.4 and 0.3 percentage points respectively. Since the referendum, there has been a renewed increase in global risk aversion. Risk premia have increased and markets have been volatile (see Financial market fragility chapter).

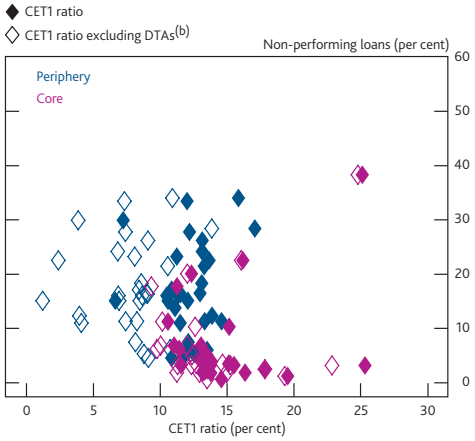
In a joint statement released on 24 June, G7 finance ministers and central bank governors noted the steps taken by G7 central banks to ensure adequate liquidity and to support the functioning of markets. They also committed to continue to consult closely on market movements and financial stability, and co-operate as appropriate.

…with market moves and volatility particularly high in the euro area.

Banking sector stocks associated with some vulnerable euro-area economies have been particularly affected, with the equity prices of banks in Italy and Spain down by 27% and 15% respectively between 23 June and 1 July (**Chart A.25**). Long-term interest rates in the euro area have also fallen further (**Chart A.26**), with the yield on ten-year German bunds at one point closing at a record low of -0.13 percentage points. Since the referendum, available broker forecasts for output growth in the euro area in 2017 have fallen by 0.4 percentage points relative to the June Consensus Survey.

Chart A.27 Some periphery euro-area banks have both large NPLs and low CET1

European banks' CET1 ratio versus non-performing loans[a]

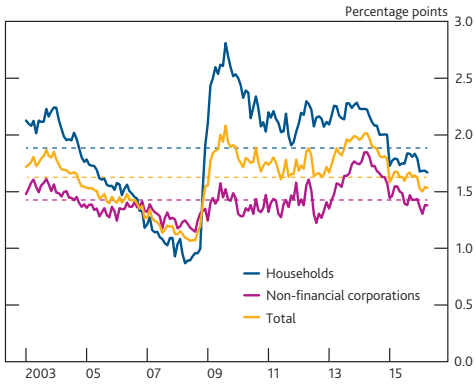


Sources: SNL Financial and Bank calculations.

(a) Data as at 2015 Q4.
(b) Data for deferred tax assets (DTAs) include some DTAs which are not counted by banks towards their regulatory capital. As such, these calculations may overestimate slightly the amount of DTAs counted as capital.

Chart A.28 Lending-deposit spreads on new business are falling in the euro area

Spreads between rates on euro-area banks' new lending and new deposits[a]

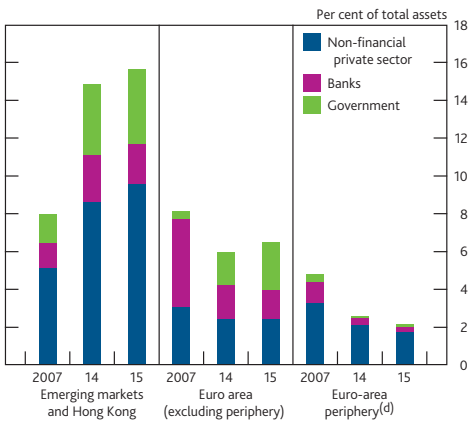


Sources: ECB and Bank calculations.

(a) Data up to April 2016. Dashed lines show average spreads since 2003.

Chart A.29 UK banks' exposures to EMEs remain sizable, but are decreasing in the euro-area periphery

UK banks' exposures to selected countries and regions[a][b][c]



Sources: BIS consolidated banking statistics, SNL Financial and Bank calculations.

(a) End of year Q4 data.
(b) Foreign claims of domestically owned banks on an ultimate risk basis.
(c) Excludes claims on non-bank financial institutions due to a lack of data prior to 2014.
(d) Consists of Greece, Ireland, Italy, Portugal and Spain.

Banks in some vulnerable euro-area countries are still working through legacy issues from the financial crisis.

This period of heightened uncertainty arrives at a time when banks in some vulnerable countries are still working through legacy issues from the financial crisis. Some periphery euro-area banks have elevated levels of non-performing loans (NPLs) and rely on deferred tax assets (DTAs)(1) to meet capital requirements. A large number of Italian and Portuguese banks with NPLs greater than 10% would have CET1 ratios below 8.5% were DTAs not to be included in their regulatory capital (**Chart A.27**).

The weak outlook for profitability of periphery euro-area banks may be exacerbated by the challenges of operating in a low nominal interest rate environment. In the face of headwinds to the recovery, the European Central Bank (ECB) reduced the rate of interest paid by banks to hold deposits at the ECB to -40 basis points on 10 March. As risk-free interest rates have fallen in the euro area, the spread between banks' lending and deposit rates has narrowed (**Chart A.28**), challenging their profitability. The introduction of a second series of targeted longer-term refinancing operations should help to alleviate some of the impact on banks' net interest margins and support profitability.

Risks in relation to Greece and its immediate financing needs were reduced by the Eurogroup agreement on 24 May to, in principle, disburse funds to the Greek government. Subsequently, the European Stability Mechanism disbursed €7.5 billion on 17 June. The Eurogroup also set out its approach to ensuring the sustainability of Greece's public debt position, and identified a range of measures that could be implemented. The IMF is due to reassess the long-term sustainability of Greek debt in the light of this agreement before the end of the year.

A crystallisation of risks in the euro area could spill back to the United Kingdom through direct economic and financial links. The euro area accounts for around two fifths of the United Kingdom's trade and around one third of UK foreign direct investment. UK banks have substantially reduced their exposure to the euro-area periphery over the past eight years. But exposures to the euro area as a whole still account for 9% of total assets (**Chart A.29**) and amount to 200% of CET1.

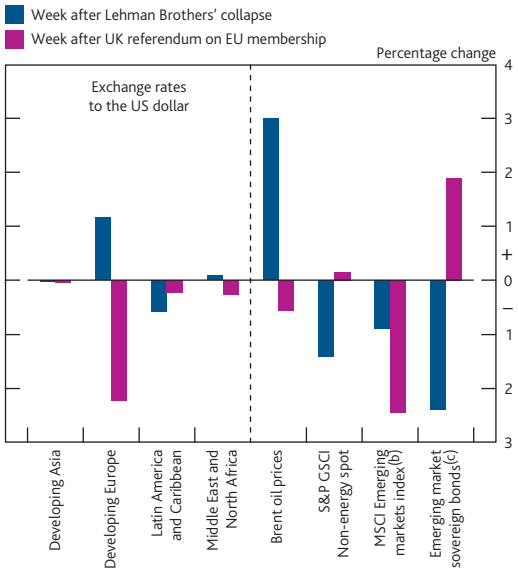
Elevated and growing debt levels in EMEs leave some vulnerable to a tightening in financial conditions.

The reduction in global risk appetite has had some spillover to emerging markets and risky asset prices (**Chart A.30**). Across EMEs, exchange rate depreciations have largely been confined to emerging Europe, reflecting their close trade relations with the European Union and the prospect of reduced euro-area

(1) DTAs are instruments that arise, on account of taxes paid or tax losses carried forward, which may be used to reduce the amount of future tax obligations.

Chart A.30 Emerging market currencies and some risky asset prices have fallen since the UK referendum

Changes in emerging market exchange rates to the US dollar[(a)] and prices of other risky assets

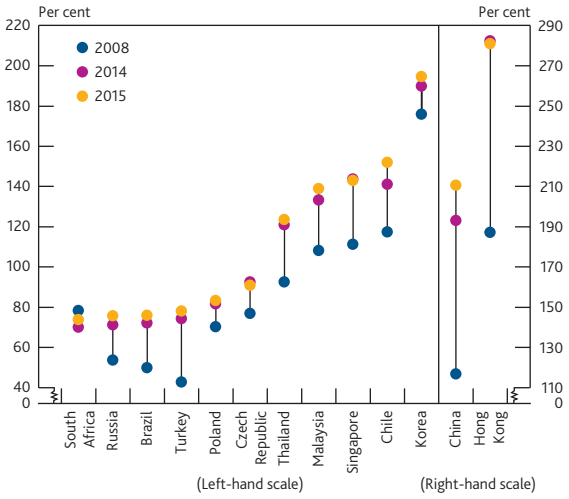


Sources: Bloomberg, Standard & Poor's (S&P), Thomson Reuters Datastream and Bank calculations.

(a) Average of the ten largest economies in each region according to their PPP-adjusted GDP.
(b) Denominated in US dollars.
(c) JPMorgan Emerging Market Bond Index Global, denominated in US dollars.

Chart A.31 Private sector debt levels have risen over 2015 in a number of countries

Non-financial private sector debt to GDP[(a)]



Source: BIS total credit statistics.

(a) End of year Q4 data.

demand. With risks to the economic outlook for EMEs remaining on the downside, renewed capital outflows associated with higher global risk aversion could contribute to a further tightening in credit conditions and challenge the ability of EMEs to service elevated debt levels. Elevated levels of private sector debt relative to GDP in some EMEs follow a period of rapid credit growth after the global financial crisis (**Chart A.31**) supported in many cases by large capital inflows. In a number of EMEs, the trend of rising private sector debt has continued over 2015, contributing to a further build-up of vulnerabilities.

The ability of some EMEs to service elevated debt levels could be exacerbated by falls in commodity prices that would put additional pressure on some regions. EME non-financial companies have US$950 billion of outstanding dollar-denominated debt securities, and currency depreciations against the US dollar would also increase the cost of servicing these debts.

Although emerging market banking sector NPLs remain low, asset quality may have deteriorated in a number of countries over 2015, with NPLs higher in most of the G20 EMEs. UK banks have significant exposures to EMEs; including Hong Kong, these amount to around 16% of total assets.

In China, the IMF's projection for growth in 2016 was revised up to 6.5% from 6.3% to reflect announced policy stimulus measures since the October 2015 *WEO*. But these have been accompanied by a pickup in annual credit growth to 13.4% in Q1 and the announcement of an explicit credit growth target of 13% this year. Rapid credit growth increases financial fragility over the medium term. This could have potentially significant spillovers to EMEs and the global economy more broadly. Around the turn of the year, China had experienced material capital outflows, reflecting uncertainty around its exchange rate policy and concerns around the economic outlook. But these flows abated after China's exchange rate policy had been clarified and output growth stabilised.

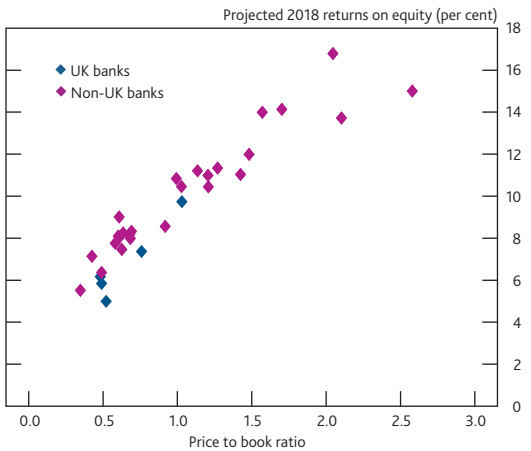
The FPC continues to monitor risks associated with the global economy. The 2015 stress-test scenario was designed specifically to assess the resilience of UK banks and building societies to a deterioration in global economic conditions. The 2015 stress-test results indicate the UK banking system would have the capacity to maintain its core functions under a severe global stress scenario.

Resilience of the UK financial system

The aggregate Tier 1 capital position of major UK banks was 13.5% of risk-weighted assets in March 2016. Since the referendum, the price to book ratios of UK-focused banks have fallen, reflecting higher risk premia, new perceptions of the economic outlook and prospects for bank profitability. However, spreads between bank wholesale debt and risk-free interest rates remain significantly lower than during previous episodes in which bank equity prices have fallen sharply, underscoring the resilience of the UK banking sector. Overall bank funding costs — taking into account any increase in the cost of equity and the change in wholesale debt funding costs — are broadly unchanged since the referendum. Beyond the core banking sector, dealer inventories of corporate securities have continued to decline and activity in repo markets has fallen. The functioning of some bond markets could be tested by high demand for liquidity, including from open-ended investment funds. The FPC supported the position of the PRA to allow insurance companies to use the flexibility in Solvency II regulations that smooth the impact of those regulations and, at the margin, reduces immediate pressure on insurance companies to sell corporate securities and other risky assets.

Chart B.1 Bank equity prices and earnings outlook before the referendum

Banks' price to book ratios and projected return on equity[a][b][c]



Sources: Bloomberg, Capital IQ, Thomson Reuters Datastream and Bank calculations.

(a) The price to book ratio relates the average share price from 1 January to 23 June 2016 with the end-2015 book, or accounting, value of shareholders' equity per share.
(b) Earnings projections are based on equity analysts' forecasts.
(c) UK banks: Barclays, HSBC, Lloyds Banking Group, RBS and Standard Chartered. Non-UK banks include a range of Australian, Canadian, European, Japanese and US banks.

Banking sector

This section assesses the resilience of the UK banking sector.

Market indicators of future prospects for the UK banking sector have deteriorated.

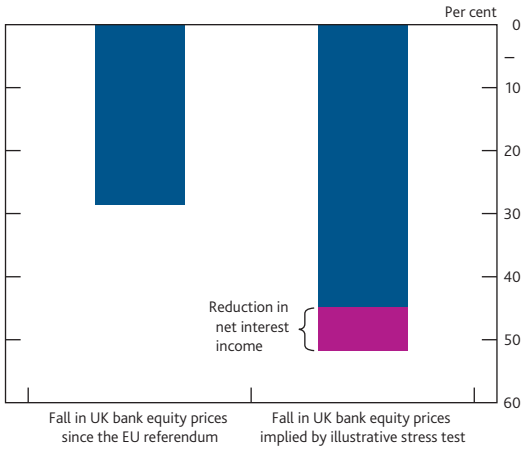
In the period between the December *Report* and the EU referendum, the price to book ratios of the largest UK banks fell from 0.83 to 0.72.

Prior to the referendum, global banks' price to book ratios were closely correlated with perceived prospects for future earnings, and a price to book ratio of 1 was broadly consistent with a projected return on equity (RoE) of 10% (**Chart B.1**). Valuations of major UK banks were in line with that pattern and in many cases reflected perceptions of weak profitability.

Since the referendum, equity prices of major UK banks have fallen sharply — by 20% on average. This is around twice the decrease implied by the historical relationship between their equity prices and the FTSE 250. Price to book ratios have fallen further, to 0.58. The changes are largest for UK-focused banks; equity prices for other major banks are broadly flat in sterling terms. The equity price changes for UK-focused banks reflect an increase in the risk premium on UK assets, and perceptions of a weaker outlook for the economy, property markets and banks' net interest margins.

Chart B.2 The recent fall in equity prices implies an economic outlook half as severe as the Bank's stress tests

Falls in equity prices[a][b]

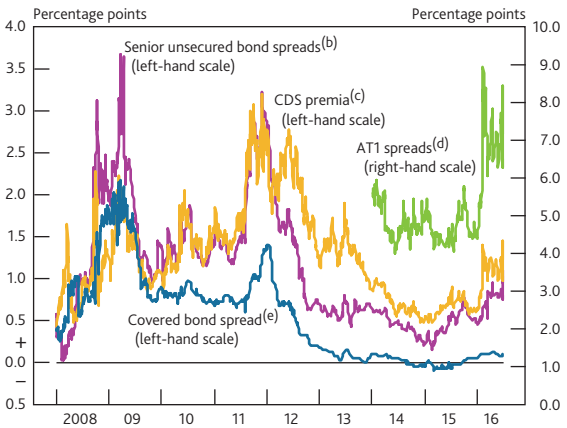


Sources: Bloomberg, Thomson Reuters Datastream and Bank calculations.

(a) UK banks are Barclays, Lloyds Banking Group and RBS.
(b) Changes in profits in the stress test have been discounted using a rate of 10%.

Chart B.3 Funding spreads have increased slightly

Major UK banks' funding spreads[a]



Sources: Bank of England, Bloomberg, Markit Group Limited and Bank calculations.

(a) UK banks are Barclays, HSBC, Lloyds Banking Group and RBS.
(b) Constant-maturity unweighted average of secondary market spreads to mid-swaps for five-year euro senior unsecured bonds, or a suitable proxy when unavailable.
(c) Unweighted average of five-year euro senior CDS premia.
(d) Unweighted average of secondary market spreads over government bonds.
(e) Constant-maturity unweighted average of secondary market spreads to swaps for five-year euro-denominated covered bonds or a suitable proxy.

If the fall in equity prices were to reflect only an increase in risk premia, it suggests that the typical cost of capital for banks has risen from around 10% to around 12%.

At the other extreme, assuming the cost of equity for banks has remained fixed at 10%, it is possible to estimate roughly the macroeconomic outlook being priced in to equities of major UK-focused banks using banks' performance in the 2014 and 2015 stress test.

Chart B.2 shows the fall in equity prices of major UK-focused banks that would, other things equal, be implied by the fall in net interest income in the 2015 stress-test scenario coupled with a reduction in all other earnings from the 2014 stress-test scenario.

The experiment combines the squeeze on net interest margins in the 2015 test, in which market interest rates fell, with the 2014 macroeconomic scenario in which there was an abrupt slowing of capital inflows, a fall in the sterling exchange rate index of 30%, falls in residential and commercial property prices of around 35% and 30% respectively, a severe recession and around a 4.5 percentage point increase in unemployment.

The fall in equity prices for major UK-focused banks implied by these stresses is around 50%, of which only 7 percentage points stems from weaker net interest income. This is calculated using the reductions in profitability in the tests, discounted at the pre-referendum cost of equity for banks (10%) and divided by those banks' market capitalisation on the day of the referendum.

The recent falls in equity prices for major UK-focused banks are just over half of those implied by the experiment (**Chart B.2**). This suggests that banks are priced for a macroeconomic outlook less severe than that against which their resilience has been tested. In those tests, major banks were resilient enough to withstand the stress and continue to supply the credit demanded by the real economy.

A macroeconomic outlook that was about half as severe as the stress tests would imply a rise in the unemployment rate to around 7.5%, falls in residential and commercial real estate prices of around 15%–20%, and a cumulative reduction in UK GDP growth in a three-year period of 4 percentage points.

Falls in equity prices have not translated into concerns around resilience.

Despite new perceptions of the economic outlook and prospects for bank profitability, falls in equity prices have not translated into concerns around resilience. Spreads of additional Tier 1 capital have risen markedly since the December *Report* (**Chart B.3**), but the bulk of this move came early in 2016, and probably reflected a necessary increase in

Table B.1 Market indicators are not as pronounced as in previous episodes of stress

Market indicators[a][b]

	Global financial crisis	Euro sovereign debt crisis	Previous *Report*	23 June 2016	1 July 2016
Price to book ratio[c]	0.35	0.43	0.83	0.72	0.58
Additional Tier 1	–	–	451	627	719
Senior CDS	222	319	59	99	123
Senior unsecured bond	368	322	50	76	96
Covered bond	218	127	5	8	12

Sources: Bank of England, Bloomberg, Markit Group Limited and Bank calculations.

(a) The footnotes to **Chart B.3** also apply here.
(b) Funding spreads are measured in basis points.
(c) Relates the share price with the book, or accounting, value of shareholders' equity per share.

the alertness of investors to the risks inherent in these instruments. And while average CDS premia for the major UK banks rose in the run-up to, and following, the referendum, these remain significantly lower than during previous episodes of stress (**Table B.1**). During the global financial crisis in 2009 and the euro sovereign debt crisis in 2011–12, average CDS premia for UK banks reached around 200–300 basis points, compared to the current level of around 125 basis points. After accounting for the fall in risk-free interest rates, wholesale funding costs are actually lower than before the referendum, by around 26 basis points on average. Overall bank funding costs — taking into account any increase in the cost of equity and the change in wholesale debt funding costs — are broadly unchanged since the referendum.

UK banks have accessed wholesale funding markets following the referendum. Lloyds Banking Group issued a US$1 billion five-year unsecured bond, the first from its holding company, and Santander UK issued a £500 million three-year covered bond.

UK banks have continued to strengthen their resilience through improved liquidity and funding…

The performance of bank funding markets since the referendum underscores the resilience of UK banks. That resilience reflects their liquidity and capital strength.

Before the crisis, UK banks were overly reliant on short-term wholesale funding and held insufficient liquid assets to meet outflows in case this funding was not renewed. That reliance on short-term funding has been significantly reduced. Short-term wholesale funding decreased in 2015 to 10.5% of major UK banks' liabilities, from 13.5% a year earlier and 26.5% at end-2007.

UK banks hold more than £600 billion of high-quality liquid assets, which is around four times the level they held before the financial crisis. They have positioned collateral with the Bank that creates the capacity to access more than £250 billion of additional funds through the Bank's normal operations and facilities. The Bank is also able to provide liquidity in foreign currency, if required, using existing swap lines in place with the Federal Reserve, the European Central Bank and other central banks.

Their liquidity position is reflected in their Liquidity Coverage Ratio (LCR — a measure of a bank's liquid assets as a proportion of the outflows it might face if funding conditions became stressed). UK banks' LCR is, in aggregate, 118% and all banks are above 100%. In aggregate, UK banks have sufficient stable funding, such as equity, long-term debt and household deposits, to meet the amount required under the provisional proposals for the Net Stable Funding Ratio.

Table B.2 Capital requirements have increased significantly

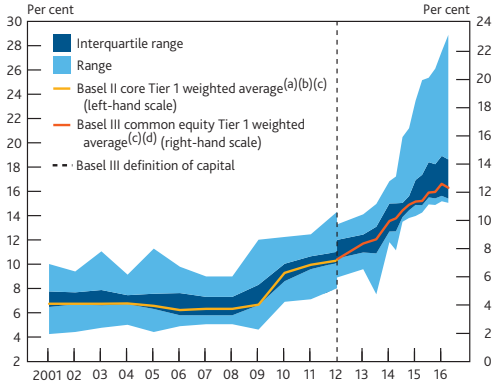
Capital requirements of the largest UK banks[a][b]

	Requirement (per cent)
Basel II CT1 minimum	2
Basel II CT1 minimum *using Basel III definitions*	1
Basel III CET1 minimum	4.5
+ capital conservation buffer	2.5
+ systemic buffers	1.0–3.5
+ countercyclical capital buffer[c]	1
Basel III CET1 minimum with buffers	9.0–11.5

(a) Expressed as a proportion of risk-weighted assets. An additional 1.5% of risk-weighted assets must be held in at least AT1 as part of the Basel III Pillar 1 requirement. UK banks are also subject to Pillar 2A requirements.
(b) See Caruana, J (2012), 'Building a resilient financial system', available at www.bis.org/speeches/sp120208.pdf.
(c) In a standard risk environment.

Chart B.4 Capital positions have improved

Major UK banks' capital ratios

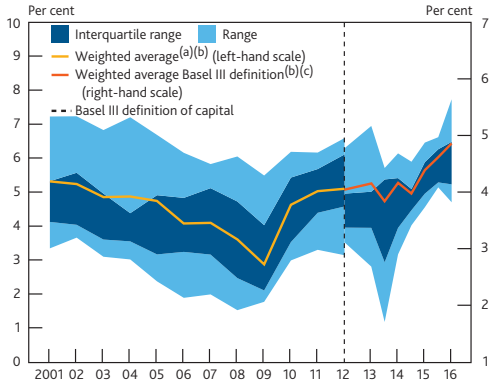


Sources: PRA regulatory returns, published accounts and Bank calculations.

(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.

Chart B.5 Leverage positions 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.4** 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.4** also applies here.

…and by increasing capital on both a risk-weighted and leverage basis.

The capital requirements of the largest UK banks are now ten times higher than before the global financial crisis (**Table B.2**), including a significantly higher minimum required capital level, plus buffers to account for systemic and other risks.[1]

Major UK banks have raised more than £130 billion of capital over the past eight years. Their aggregate ratio of common equity Tier 1 (CET1) capital to risk-weighted assets rose to 12.3% in March 2016, from an estimated 4% prior to the financial crisis (**Chart B.4**). The aggregate Tier 1 capital ratio of major UK banks now stands at 13.5% of risk-weighted assets — in line with the level that the FPC has judged appropriate for the UK banking system, in aggregate, given prevailing risk-weight measures.

Since January 2016, the major UK banks have been required to meet non risk-based capital requirements in the form of a leverage ratio. This currently comprises a minimum requirement plus systemic and countercyclical buffer elements. The major UK banks' aggregate leverage ratio was 4.9% at end-March 2016, above the current requirement of 3.1% (**Chart B.5**). The FPC has reviewed its policy regarding the leverage ratio (see Review of the FPC Direction on a leverage ratio requirement and buffers chapter).

Capital generation through retained earnings is expected to be more challenging in the future…

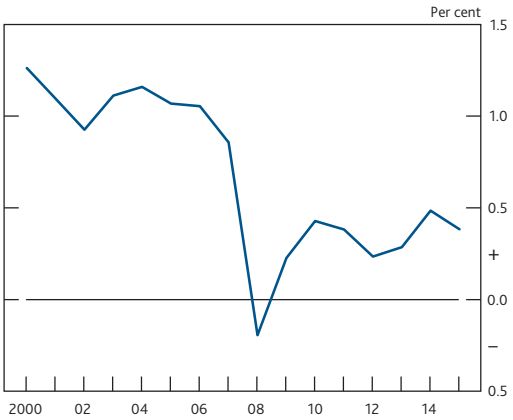
Major UK banks' profitability has fallen since the financial crisis and remains subdued (**Chart B.6**). Persistently weak profitability poses challenges for the ability of banks to generate capital internally and, at the margin, reduces their resilience to shocks. The failure of returns on assets to recover after the financial crisis, even as impairments have fallen and operating costs have been reduced, is explained largely by charges relating to past misconduct and by lower trading income (**Chart B.7**).

UK banks disclosed a further £15 billion of provisions relating to past misconduct in their 2015 results, reducing pre-tax profits by around 50%. Given the number of ongoing investigations and redress actions, it is likely that misconduct costs will remain high in the near future. But there is considerable uncertainty about the size of these costs in the longer run. As in 2015, the 2016 stress test will incorporate stressed projections for misconduct costs and fines beyond those sums paid or provided for by the end of 2015.

(1) This buffer framework is now fully specified, following the publication of the FPC's framework to guide the setting of the systemic risk buffer for ring-fenced banks and large building societies, which is expected to add around 0.5% of risk-weighted assets from January 2019; www.bankofengland.co.uk/financialstability/Documents/fpc/srbf_cp260516.pdf. These requirements will be fully implemented by January 2019.

Chart B.6 Major UK banks' returns on assets have remained low since the financial crisis

Major UK banks' pre-tax return on assets[(a)(b)]

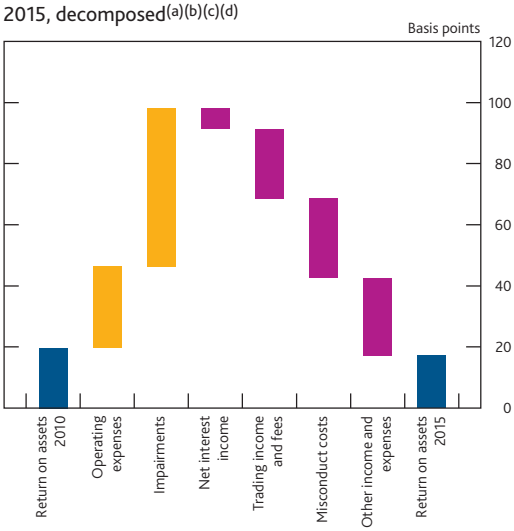


Sources: Published accounts and Bank calculations.

(a) Return on assets before tax is defined as pre-tax profits divided by average assets for the year.
(b) When banks in the sample have merged, aggregate profits for the year are approximated by those of the acquiring group. National Australia Bank is excluded from the sample in 2015.

Chart B.7 Weak trading income and misconduct costs have suppressed profitability

Changes in UK banks' pre-tax return on assets between 2010 and 2015, decomposed[(a)(b)(c)(d)]



Sources: Bank of England, participating banks' Firm Data Submission Framework (FDSF) data submissions, published accounts and Bank calculations.

(a) Returns are defined as profits attributable to shareholders.
(b) Assets are annual averages.
(c) When banks in the sample have merged, aggregate profits for the year are approximated by those of the acquiring group.
(d) UK banks are Barclays, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK.

The major UK banks have seen particularly large decreases in investment banking revenues. These have fallen 40% since 2010, compared to around 25% for European banks and 10% for US banks. These falls were driven by lower revenues from fixed income, currencies and commodities trading activities. Investment banking revenues were particularly weak in 2016 Q1. Across all global banks active in these trading activities, revenues in 2016 Q1 were 25% lower than a year earlier.

…leading banks to plan further restructuring to boost returns…

UK banks plan to improve their profitability partly by exiting businesses with lower returns. That includes further shrinkage of their global investment banking activities, where exposures have already been reduced considerably since the crisis. UK banks are also targeting significant cost savings through, for example, cutting staff and IT costs. Any further reductions in returns due to economic conditions would increase the scale of the challenge that UK banks face in restructuring their business models.

…including to meet ring-fencing requirements.

UK banks will also need to restructure for other purposes. For instance, the Bank is steadily implementing measures to develop ring-fenced banks. From January 2019, banks with core deposits greater than £25 billion will be required to ring-fence their core retail activities. The Prudential Regulation Authority (PRA) asked firms in scope to submit near-final plans for implementing ring-fencing by 29 January 2016, and continues to engage actively with firms in reviewing these plans.

Market-based finance

This section assesses the resilience of market-based finance in the United Kingdom.

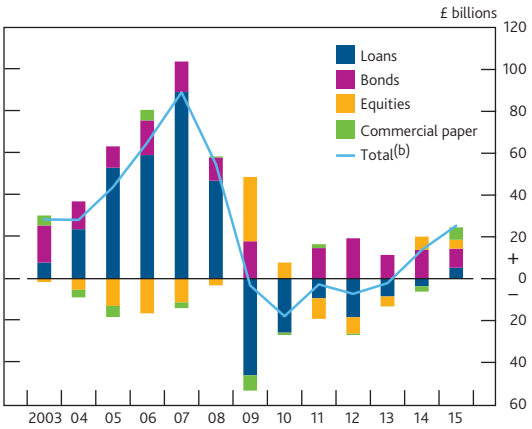
Market-based finance is an important source of financing for many UK companies.

Non-bank financial institutions (NBFIs) represent key sources of market-based finance and account for almost half of the UK financial system's total assets. NBFIs provide finance to the real economy through direct finance — for example, lending to households and businesses by non-bank finance companies — and by investing in capital markets — such as corporate bond and equity markets.

On a cumulative basis, capital markets account for all net finance raised by UK private non-financial corporations (PNFCs) since the global financial crisis, primarily in the form of bond issuance (**Chart B.8**). UK PNFCs issue bonds in a range of currencies, with just over one third of amounts outstanding denominated in sterling. Gross issuance of euro-denominated debt by UK PNFCs was particularly strong

Chart B.8 Since the crisis, UK private non-financial corporations have raised less net finance from banks and more from capital markets

Net finance raised by UK PNFCs[a]

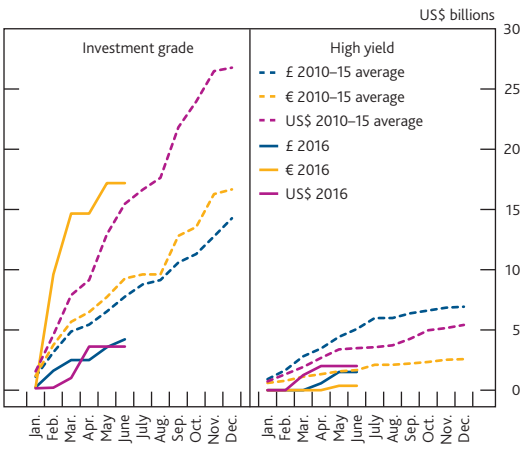


Sources: Bank of England and Bank calculations

(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) Owing to the seasonal adjustment methodology, the total series may not equal the sum of its components.

Chart B.9 Since the beginning of the year, UK PNFCs' gross bond issuance has been driven by investment-grade issuance in euros

UK PNFCs' cumulative gross bond issuance[a][b]



Sources: Dealogic and Bank calculations.

(a) Issuance by: PNFCs incorporated in the United Kingdom; PNFCs' finance vehicles, whose parent operates in the United Kingdom; and special purpose vehicles, where the parent is a PNFC operating in the United Kingdom. Excludes deals guaranteed by a foreign parent.
(b) Includes medium-term notes, which are classified as investment-grade bonds unless rated BB+ or lower.

in the early part of 2016 (**Chart B.9**). But issuance has since fallen off, probably reflecting uncertainty around the EU referendum.

Investment in capital markets is reliant on market liquidity…

The provision of market-based finance will be more resilient when core financial markets are liquid and function smoothly. When market liquidity is reliable, it encourages participation in financial markets, by providing confidence both for investors and for issuers (see Developments in market liquidity chapter).

A number of markets, including corporate bond markets, rely on core intermediaries, or 'dealers', for the provision of market liquidity. Dealers use their balance sheets to 'warehouse' trading positions, while they seek to match buyers and sellers. They also support other investors, such as hedge funds, in funding their trading activities, by providing financing through the securities lending and repo markets. In this way, repo activity supports market liquidity.

…but dealers appear to be less willing to build inventories and extend repo financing…

Dealer inventories in sterling and US corporate bonds have been declining in recent years (**Chart B.10**). This may be an indication of their reduced willingness to allocate balance sheet capacity to inventories of corporate securities. Similarly, there is evidence to suggest that dealers are allocating less balance sheet capacity to repo activity. Activity in UK gilt repo and US repo markets has contracted significantly since the end of 2013, by around 25% and 10% respectively (**Chart B.11**).

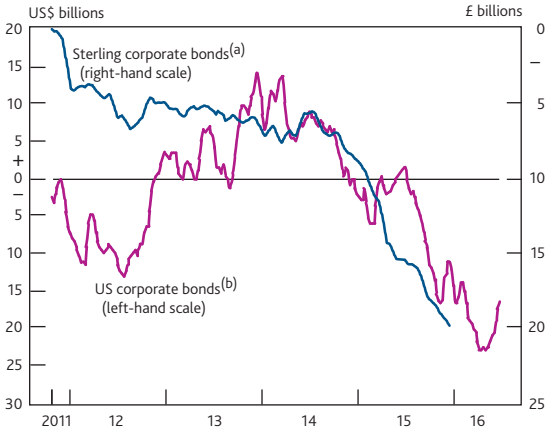
In some markets, there is evidence that market liquidity has fallen (see Developments in market liquidity chapter). This raises the possibility that market functioning could become impaired during times of stress. Following the referendum, markets have generally functioned well with no apparent impairment of price discovery. Activity in some fixed-income markets has been subdued but largely orderly (see Financial market fragility chapter).

…which means market functioning could be tested by high demand for liquidity, including from open-ended investment funds.

The functioning of some bond markets could be tested by high demand for liquidity, including from open-ended investment funds. Total net assets of global open-ended investment funds have nearly tripled since the crisis (**Chart B.12**). These funds offer short-term redemptions to investors while in some cases investing in longer-dated and potentially illiquid assets. Large-scale investor redemptions could result in sales of assets by funds that might test markets' ability to absorb them, potentially impairing market liquidity. Since the EU referendum, open-ended investment funds invested in UK equities, sterling corporate bonds and gilts have not, in aggregate, experienced material outflows. However, the FPC will continue to monitor investment fund flows closely.

Chart B.10 Dealer inventories in sterling and US corporate bond markets have fallen

Cumulative change in dealers' inventories of sterling and US corporate bonds

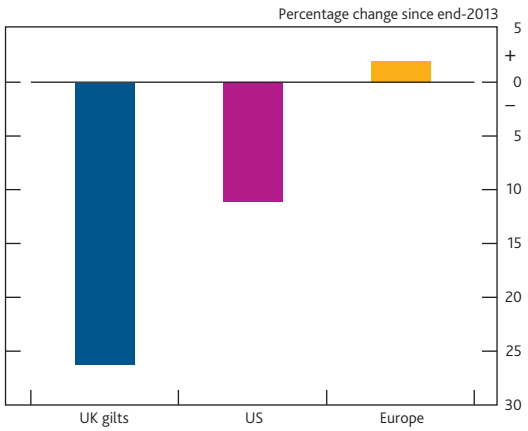


Sources: Federal Reserve Bank of New York, FCA and Bank calculations.

(a) Monthly moving average of cumulative change in dealers' inventories of sterling corporate bonds. Cumulative inventory change calculations only include transactions reported by FCA-regulated dealers on a principal basis and in instruments issued more than three months ago. Duplicate, erroneous and outlier transactions have been removed on a best-endeavours basis. Data include intragroup transactions. Data from 2 November 2011 to 17 December 2015.
(b) Monthly moving average of cumulative change of US primary dealer net positions in US corporate bonds. Data from 2 November 2011 to 22 June 2016.

Chart B.11 Global repo activity has continued to contract in recent years

Repo and reverse repo activity in the UK, US and European markets(a)



Sources: Bank of England, Federal Reserve Bank of New York, International Capital Market Association (ICMA) and Bank calculations.

(a) UK data show the percentage change between end-November 2013 and end-February 2016 (the latest data available) in outstanding gilt repo and reverse repo transactions of a sample of UK-resident banks. US data show percentage change between end-2013 and the start of March 2016 in US primary dealers' repo and reverse repo financing of US government and select other securities. Data for Europe show percentage change between end-2013 and end-2015 (the latest data available) in outstanding repo and reverse repo transactions of a sample of financial institutions in Europe (against a range of securities), as reported in the ICMA European repo market survey.

The FPC completed its detailed assessment of the investment activities of open-ended investment funds in 2015. The Committee's full assessment was published in the December *Report*.(1)

The FPC supports work by the Bank of England to incorporate the behaviour of investors in open-ended investment funds into system-wide simulations of market stress events, including large-scale fund redemptions.

The FPC also supports work by the Financial Stability Board (FSB) to assess vulnerabilities in relation to asset management activities. The FSB has highlighted liquidity mismatch between fund investments and redemption terms, and fund leverage, as key structural vulnerabilities. In June, the FSB published a consultative document setting out proposed policy recommendations to address these vulnerabilities.(2)

At the same time, dealers are more resilient.

Developments in market liquidity conditions are likely, in part, to be a function of increased regulatory requirements designed to enhance the resilience of banks, including dealers. Other things equal, this means that markets should be more resilient to stress, albeit at a lower level of market liquidity in 'normal times'.(3)

Following the referendum, equity prices of the world's largest dealers have fallen, with nearly all experiencing sharp declines. However, market perceptions of dealers' credit risk, as measured by the cost of default protection, have increased but remain significantly lower than during the global financial crisis or the euro-area crisis, underscoring dealers' increased resilience (see also Banking sector section).

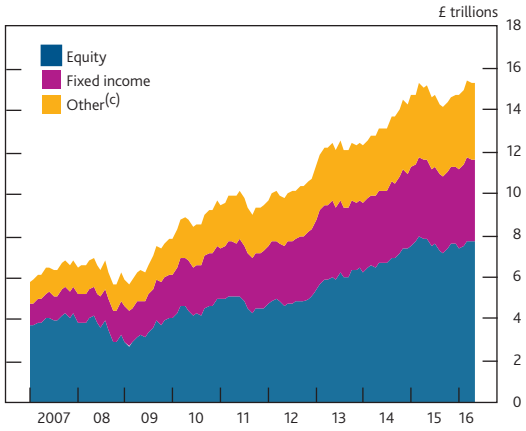
The aggregate leverage ratio of the world's largest dealers has continued to rise, increasing from 4.6% at end-2014 to 5.2% at end-2015 (**Chart B.13**).

Authorities regularly test the resilience of dealers' capital ratios to stressed macroeconomic and financial conditions. In the United States, the Federal Reserve undertakes a Comprehensive Capital Analysis and Review annually to evaluate the capital planning processes and capital adequacy of the largest US bank holding companies. Results from the latest exercise were published on 29 June 2016.(4) US firms have substantially increased their capital and improved their risk management capacities since the first round of stress tests

(1) See Box 2 on pages 23–25 of the December 2015 *Financial Stability Report*; www.bankofengland.co.uk/publications/Documents/fsr/2015/dec.pdf.
(2) See www.fsb.org/2016/06/fsb-publishes-proposed-policy-recommendations-to-address-structural-vulnerabilities-from-asset-management-activities/ for more detail.
(3) See Anderson, N, Webber, L, Noss, J, Beale, D and Crowley-Reidy, L (2015), 'The resilience of financial market liquidity', *Bank of England Financial Stability Paper No. 34*; www.bankofengland.co.uk/financialstability/Pages/fpc/fspapers/fs_paper34.aspx.
(4) The Federal Reserve Board did not object to the capital plans of 30 of the 33 bank holding companies participating in this year's exercise. Morgan Stanley was asked to address certain weaknesses observed in its capital planning process but the Federal Reserve did not object to the firm's capital plan. The Federal Reserve objected to the capital plans of Deutsche Bank Trust Corporation and Santander Holdings USA, Inc. based on qualitative concerns. See www.federalreserve.gov/newsevents/press/bcreg/20160629a.htm for more detail.

Chart B.12 Open-ended funds have grown significantly over the past decade

Total net assets of global open-ended investment funds (excluding money market funds)[a][b]

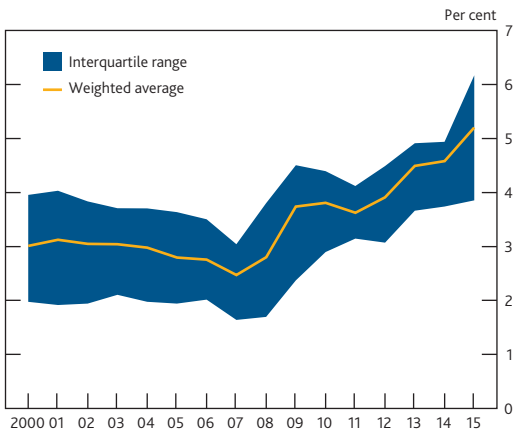


Sources: Morningstar, Thomson Reuters Datastream and Bank calculations.

(a) The data cover all open-ended funds reporting to Morningstar.
(b) Some of the increase in total net assets may be accounted for by the increase in Morningstar coverage over the period.
(c) 'Other' includes all Morningstar's 'global broad category groups' except for equity, fixed income and money market funds.

Chart B.13 Dealers' leverage ratios continued to rise

Dealers' leverage ratios[a][b]



Sources: SNL Financial, The Banker/TheBankerDatabase.com, banks' published accounts 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.
(b) Dealers included are Bank of America Merrill Lynch, Barclays, BNP Paribas, Citigroup, Crédit Agricole, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan Chase & Co., Mitsubishi UFJ, Morgan Stanley, RBS, Société Générale and UBS. Pre-crisis data also include Bear Stearns, Lehman Brothers and Merrill Lynch.

led by the Federal Reserve in 2009, enhancing the resilience of major US dealers.

The FPC has been monitoring developments in market liquidity closely.

In 2014, the FPC identified the fragility of market liquidity as a key risk to its medium-term priority of ensuring the resilience of market-based finance. The Committee has been monitoring market liquidity closely. Given the wider importance of repo markets and the evidence of changes in repo market functioning in a number of jurisdictions, the FPC sees merit in further work being undertaken domestically and internationally to assess changes in the repo market and their economic consequences (see Developments in market liquidity chapter).

The Committee has also completed its review of the FPC Direction on a leverage ratio requirement and buffers. The FPC judges that any internationally agreed leverage ratio standard should contain material, usable, buffers that can be drawn on in stress. In particular, the FPC urges the inclusion of a countercyclical leverage ratio buffer that can be cut in a stress. Without such buffers, banks might become concerned about meeting their regulatory constraints and withdraw from activities such as repo and market-making, thereby aggravating shocks (see Review of the FPC Direction on a leverage ratio requirement and buffers chapter).

Recent market moves could tighten regulatory constraints on insurers…

Although the price of equity issued by UK insurers has recently declined more sharply than broader equity indices (**Chart B.14**), the cost of protection against insurers' default increased only modestly over the first half of 2016, and remains very low (**Chart B.15**). This reflects market perceptions of the resilience of insurance companies.

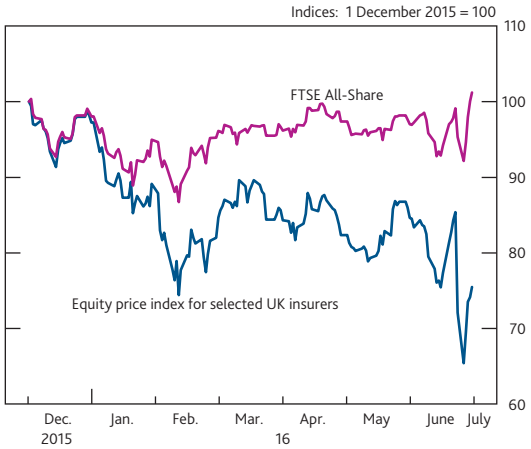
However, life insurers are particularly exposed to falls in interest rates, as these increase the present value of their liabilities, which are typically long term. Since the December *Report*, the UK ten-year swap rate has fallen from around 1.8% to 1%.

Solvency II regulations, which came into force on 1 January 2016, have a tendency to tighten regulatory constraints on insurance companies following sharp falls in market interest rates. This arises, in part, through the introduction of the 'risk margin': a provision that increases the best estimate of a firm's insurance liabilities to produce a market-consistent value. This can create incentives for insurance companies to sell corporate securities and other risky assets following falls in market interest rates.[1]

(1) See 'High-level overview of Bank of England response to the European Commission call for evidence on the EU regulatory framework for financial services', January 2016; www.bankofengland.co.uk/financialstability/Documents/regframework/highleveloverview010216.pdf.

Chart B.14 The price of equity issued by UK insurers has fallen sharply

Equity price index for selected UK insurers and the FTSE All-Share[a]

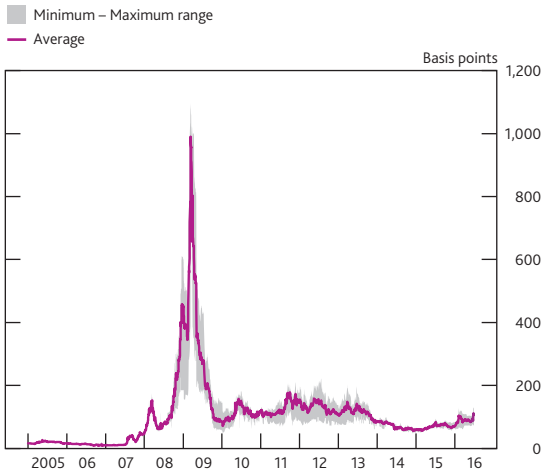


Sources: Bloomberg, Thomson Reuters Datastream and Bank calculations.

(a) Arithmetic mean of indexed share prices of selected UK insurance groups (Aviva, Legal and General, Prudential and Standard Life).

Chart B.15 Market perceptions of UK insurers' credit risk deteriorated modestly in 2016 H1

Cost of default protection for selected UK insurers[a][b]



Sources: Markit CDS Pricing and Bank calculations.

(a) Arithmetic mean of five-year, senior credit default swap premia of selected UK insurance groups (Aviva, Legal and General, Prudential and Standard Life).
(b) Data for Standard Life's five-year, senior credit default swap premia became available in October 2006, while data for Aviva became available in June 2009.

…but flexibility in recalculating transitional measures can attenuate pressures for procyclical investment behaviour.

To support an orderly transition to the new Solvency II regime, insurers' solvency coverage — the ratio of capital resources to capital requirements — is calculated taking into account 'transitional measures on technical provisions' (TMTPs). These measures ensure that the impact of the new regulations on insurers' balance sheets is smoothed over a 16-year period, rather than being recognised in full on 1 January 2016. The PRA has previously communicated its support for firms' use of transitional measures as set out in the Solvency II Directive. In May, the PRA set out the scope for firms to recalculate their transitional measures in response to the market environment.(1) It invited eligible firms to apply to recalculate their TMTPs to account for recent changes in market conditions, including sharp falls in market interest rates.

This recalculation of TMTPs will attenuate the effect of the fall in long-term interest rates on firms' regulatory constraints. At the margin, it is also likely to reduce immediate pressure on insurance companies to sell corporate securities and other risky assets. Reflecting this beneficial macroprudential impact, the FPC supports the position of the PRA.

Derivative markets continue to evolve, in part, in response to post-crisis reform agenda…

Derivative markets are essential for enabling firms to hedge financial risk, ultimately supporting economic activity. But they may also be used for speculative purposes and can give rise to intra-financial system exposures, potentially of a complex and opaque nature. These markets have been undergoing significant change over the past few years, in line with the post-crisis reform agenda. The reforms have aimed to reduce the aggregate counterparty risk in the financial system and to increase the transparency of derivatives exposures. This has been done through the introduction of mandatory central clearing of standardised over-the-counter (OTC) derivatives, the introduction of margin requirements for non-centrally cleared derivatives and the reporting of derivatives trades to trade repositories.

As a result, the proportion of centrally cleared OTC interest rate and credit derivatives has been increasing over the past few years, to around a half and a quarter, as at end-2015, respectively. This has increased the importance of central counterparties (CCPs), both in terms of their resilience and the market-wide impact of their margining practices. While the network of counterparty risk has become simpler, this creates by design a concentration of risk in CCPs.

(1) *PRA Supervisory Statement SS6/16*, 'Recalculation of the 'transitional measure on technical provisions' under Solvency II', May 2016; www.bankofengland.co.uk/pra/Documents/publications/ss/2016/ss616.pdf.

…with authorities continuing to strengthen the regulatory framework for resilience of CCPs.

Initial margins are an important tool for enhancing the resilience of CCPs, by mitigating counterparty exposures. But they may also increase the risk of procyclical effects on market conditions if margin requirements increase unduly during periods of stress. This would require counterparties posting margin to have to find additional liquid assets, often at precisely the times when it is most difficult for them to do so. International regulatory standards for margin calculations by CCPs and bilateral counterparties explicitly recognise the need to limit procyclicality in margin requirements.

UK CCPs had prepared extensively for the EU referendum. In response to an increase in market volatility following the referendum result, UK CCPs' margin requirements have so far increased only modestly. Increases in initial margin requirements were also observed at some non-UK CCPs. Some UK CCPs and other financial market infrastructures (FMIs) also had to deal with significantly higher than normal volumes of trades on 24 June due to the high levels of trading activity, notably in equities. UK FMIs have so far absorbed this increase in market activity and volatility using routine processes, for example, extending their input windows, where necessary.

The Committee on Payments and Market Infrastructures (CPMI) and International Organization of Securities Commissions (IOSCO) have started work to develop a framework for conducting supervisory stress tests of CCPs, with a particular focus on the interlinkages between CCPs and their clearing members. The European Securities and Markets Authority (ESMA) completed a similar exercise for 17 EU CCPs earlier this year, concluding that the system of European CCPs would be resilient to extreme but plausible market developments.(1) Future work will aim to improve the type of methodology used and the range of risks captured in exercises of this kind, which have the potential to provide important information to both micro and macroprudential authorities.

In mid-2016, the CPMI and IOSCO are expected to publish a consultative report detailing further guidance on how CCPs should comply with certain key elements of the April 2012 'Principles for financial market infrastructures'. In parallel, the FSB will conduct an initial consultation on resolution strategies for CCPs by September 2016.

(1) See www.esma.europa.eu/press-news/esma-news/esma-publishes-results-eu-central-counterparties-stress-test for more detail.

Developments in market liquidity

The FPC has reviewed how the liquidity of some core financial markets has changed in recent years.

In the Statement following its March meeting, the FPC noted that it has been reviewing recent developments in liquidity in some core financial markets. This chapter sets out the FPC's assessment of these developments.

- **There has been some reduction in the liquidity of some government and corporate bond markets in recent years.** This has occurred alongside some evidence of core intermediaries, or 'dealers', becoming less willing to build inventories of cash securities, such as bonds, potentially reducing their effectiveness as market makers.

- The most marked changes in market conditions have been in the securities financing markets, specifically, those for repurchase agreements, or 'repo'. The FPC judges that **these developments are of sufficient importance to financial stability and market functioning to warrant further domestic and international assessment of their causes and consequences**.

- The FPC judges that **post-crisis regulations, including the leverage ratio, have probably been one driver of these developments, among others. But some of their impact is likely to be transitory as firms adjust to new regulations.**

- There could be a more enduring impact on market liquidity that implies an increase in the cost of financing for real economy borrowers. The FPC continues to judge that, **even taking these potential costs into account, the net economic effect of post-crisis regulations has been materially positive**, reducing the likelihood and severity of market stress and financial instability in general.

- Nevertheless, the FPC judges it appropriate **to adjust regulatory measures, where opportunities exist, to minimise their impact on the liquidity of core financial markets, without compromising their positive effect on resilience.** The FPC has adopted this principle in its review of the leverage ratio framework (see Review of the FPC Direction on a leverage ratio requirement and buffers chapter).

- In particular, the FPC notes the important role of **usable regulatory buffers** in leverage and risk-based capital frameworks in allowing intermediaries to draw on their capital buffers where necessary. Such buffers can help absorb the impact of shocks, allowing dealers to continue to provide market-making services when they are most needed and where withdrawal of those services would risk amplifying the effect of the shocks on credit conditions and the real economy.

Market liquidity has economic benefits where it is reliable and resilient to stress.

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) It also supports price discovery and competitive pricing for financial assets, which, in turn, aids the proper allocation of capital and risks across the economy.

In stressed conditions, the evaporation of liquidity can lead to disorderly movements in prices, undermining the confidence of both issuers and investors. Liquidity can be particularly prone to evaporate during stress where it has been previously supported by excessive risk-taking. This risk crystallised during the financial crisis when core intermediaries, or 'dealers' — who had engaged in excessive levels of securities financing and held large inventories of cash securities on their balance sheets — were forced to reduce their market-making services. As a result, liquidity evaporated in a range of markets, amplifying the impact of the crisis on market functioning, and the wider economy.

Not all markets can, or should, be equally liquid. The ease with which buyers and sellers can be found will depend on fundamental characteristics of the asset (Anderson *et al* (2015)).(2) For example, the seller of a relatively standardised asset that is widely used as collateral in securities financing transactions (eg a benchmark US Treasury) is likely to find it easier to locate a buyer than the seller of a more complex instrument (eg an asset-backed security).

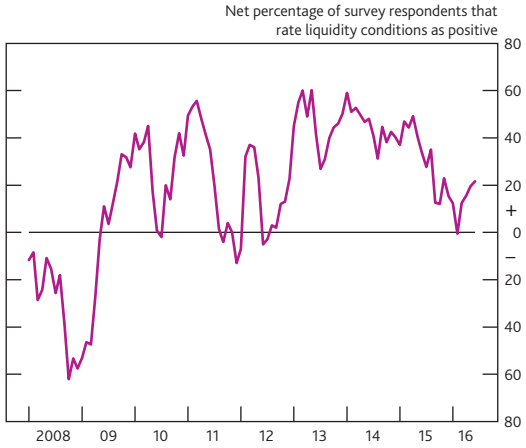
(1) Fair and Effective Markets Review, Final Report, June 2015; www.bankofengland.co.uk/publications/Pages/news/2015/055.aspx.
(2) Anderson, N, Webber, L, Noss, J, Beale, D and Crowley-Reidy, L (2015), 'The resilience of financial market liquidity', *Bank of England Financial Stability Paper No. 34*; www.bankofengland.co.uk/financialstability/Documents/fpc/fspapers/fs_paper34.pdf.

In reviewing developments in market liquidity, the FPC is concerned that liquidity in cash markets is as plentiful as possible while remaining resilient and reliable.

According to market participants, liquidity of some markets has declined in recent years.

Since 2014, market participants have been reporting lower market liquidity (**Chart A**). Given occasional bursts of volatility associated with short-term illiquidity, concerns have also been raised that market liquidity may have become more fragile (IMF (2015)).(1)

Chart A BofA Merrill Lynch survey: 'How would you rate liquidity conditions at this time?'(a)



Source: BofA Merrill Lynch Global Fund Manager Survey.

(a) Survey question asked: 'How would you rate liquidity conditions (eg depth of markets, narrowness of bid-offer spreads, ease of execution, etc.) at this time?'.

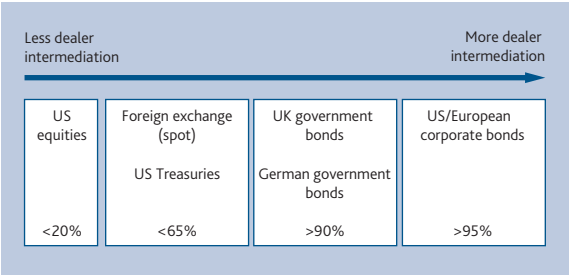
In some important markets, liquidity is supported by dealers warehousing risk…

In a number of financial markets, market liquidity is supported by dealers acting as market makers — using their balance sheet to 'warehouse' trading positions, typically for short periods, while they seek to match buyers and sellers. The importance of dealer intermediation varies across markets. In general, core fixed income markets, such as those for government and corporate bonds, are more reliant on dealers for market-making than those for equities and foreign exchange (**Table 1**).

…and using their balance sheet to provide funding to other investors.

Dealers also provide financing services to other investors, in particular, through the securities financing markets, specifically, those for repurchase agreements, or 'repo'. For example, leveraged investors, such as hedge funds, use repo markets both to pledge securities as collateral with dealers, who offer financing in turn, and to borrow securities to cover short positions. The most common type of collateral used is government securities.

Table 1 Importance of dealer intermediation in core markets(a)(b)



Sources: Bank of England, Bank for International Settlements, Debt Management Office, Federal Reserve Bank of New York, ICAP BrokerTec, McKinsey and Greenwich Associates, US Securities and Exchange Commission and Bank calculations.

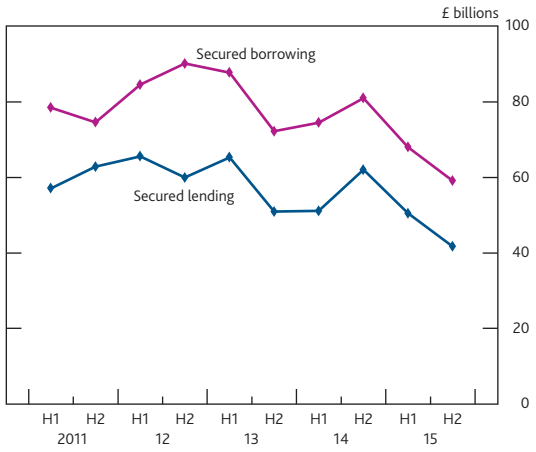
(a) Figures show estimates of the proportion of transactions executed as a 'request-for-quote' via both voice and electronic trading, including via single and multi-dealer trading platforms.
(b) Includes dealer-to-client and interdealer transactions.

Funding and market liquidity are intrinsically related (Box 4, December 2014 *Report*).(2) Funding liquidity — which refers to the ease by which market participants can raise cash by borrowing on either a secured or unsecured basis — supports the trading activities of investors. This in turn supports turnover, market depth and thereby market liquidity (Dudley (2016)).(3) A more liquid market then increases the desirability of some assets as collateral, thereby supporting funding liquidity.

There has been a decline in the availability of, and increase in the cost of, repo financing.

Gilt repo (secured borrowing) and reverse repo (secured lending) volumes declined by over 25% in 2015, with a sharp deterioration in 2015 H2 (**Chart B**). There are indications of similar developments in US Treasury repo markets, where the

Chart B Reported sterling secured borrowing and lending (daily averages)(a)



Sources: MMLC Sterling Money Market Survey and Bank calculations.

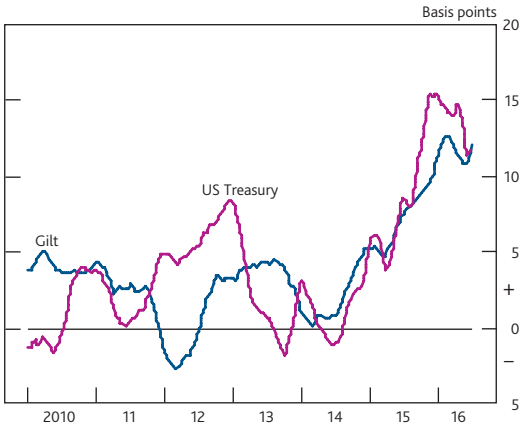
(a) Daily average flows are reported as the value of sterling secured lending/borrowing in the survey month divided by the number of working days during that period.

(1) IMF (2015), *Global Financial Stability Report*, April, see Chapter 2; www.imf.org/External/Pubs/FT/GFSR/2015/02/pdf/c2_v2.pdf.
(2) See www.bankofengland.co.uk/publications/Documents/fsr/fsrboxes/1412box4.pdf.
(3) Dudley, W C (2016), 'Market and funding liquidity: an overview'; www.newyorkfed.org/newsevents/speeches/2016/dud160501.

amount of dealer repo financing outstanding has fallen by over 10% since 2014.(1)

The cost of borrowing in repo markets has also increased relative to near risk-free rates. Since the start of 2015, the spread between three-month government bond repo and three-month overnight indexed swap rates has roughly doubled in sterling and dollar markets (**Chart C**). Market contacts suggest that there is significant variation in the prices offered to different clients, with smaller increases for clients who use other services provided by dealers. Pricing also varies according to the maturity of repo contracts.

Chart C Three-month gilt and US Treasury repo rates minus three-month sterling and US dollar OIS rates(a)



Sources: Bank of England, Bloomberg and Bank calculations.

(a) Three-month moving average. Gilt repo rates are indicative and based on internal rates collection. Overnight indexed swap rates (OIS) are taken as a proxy for market-based risk-free rate. Data up to 30 June 2016.

Repo markets aid the smooth flow of cash and securities around the system for purposes beyond supporting trading activity in core financial markets. For example, they are used by large companies, money market funds and debt management offices to place cash on secured deposit. Long-term investors, such as pension funds, access repo markets to finance gilt purchases used to hedge the exposure of their liabilities to interest rates and inflation.

Repo markets also support market functioning. For example, they allow prompt borrowing of securities to prevent settlement fails, and are commonly used to raise cash for use as margin in derivatives transactions. In stressed conditions, repo markets offer banks a route to convert their holdings of liquid assets into cash. If banks are unable to access the repo market they may be forced to sell liquid assets, which could exacerbate stress. Selling assets outright may also incur losses from the unwinding of interest rate hedges.

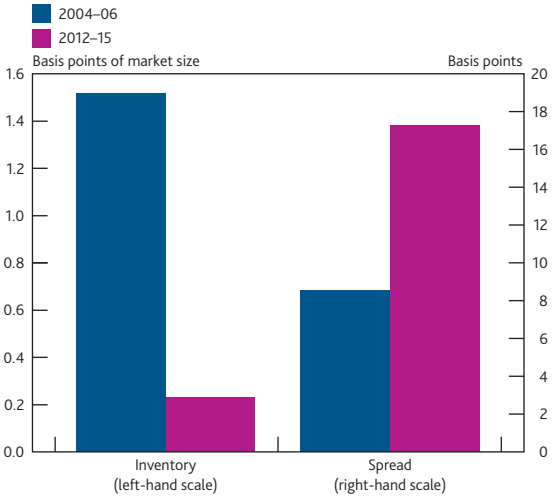
Given the wider importance of repo markets and the evidence of changes in repo market functioning in a number of jurisdictions, **the FPC sees merit in further work being undertaken domestically and internationally to assess changes in the repo market and their economic consequences.**

There are also indications of dealers being less willing to warehouse securities.

In cash securities markets, dealers' inventories have fallen sharply since the financial crisis; for example, US corporate bonds held by US primary dealers. To a large extent, this decline reflects a necessary reduction in proprietary risk-taking by dealers and subdued activity in securitisation markets. But these inventories are now lower than at any time since 2002, while the amount of US corporate debt outstanding has doubled during that time. Since 2014, there has been a further decline in dealer inventories of both sterling and dollar corporate bonds (see Market-based finance section). This may be an indication of a reduced willingness of dealers to warehouse securities.

The less willing dealers are to build inventories, the more likely it is that sellers will have to trade at a discount. There is evidence suggesting that, in recent years, dealers have been varying their inventories less than in the past to meet demand — for example, in response to sales of US high-yield corporate bonds — with the result that bond spreads have been varying more (**Chart D**).

Chart D Responsiveness of US high-yield corporate bond dealer inventory and spreads to reduced demand from asset managers(a)



Sources: BofA Merrill Lynch Global Research, Dealogic, EPFR Global, Federal Reserve Bank of New York, SIFMA and Bank calculations.

(a) Response (at one week) of US dollar-denominated high-yield corporate bond spreads and US primary dealers' inventory in these securities to a one standard deviation decline in asset manager demand. Data up to February 2015.

Developments in market and funding liquidity are consistent with higher yields on some assets.

A potential consequence of both lower funding liquidity and reduced willingness of dealers to warehouse securities and make markets is that investors require more compensation for

(1) See www.newyorkfed.org/newsevents/speeches/2016/dud160501.

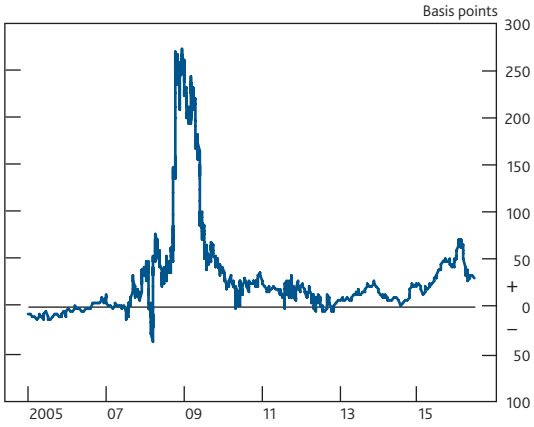
holding cash assets — a higher 'liquidity premium' — for example, relative to the return on related derivatives that do not need to be funded.

Spreads between cash assets and related derivatives are variable, and can be affected by various factors, such as hedging activity. Nevertheless, it is striking that, since early 2015, the spreads between yields on some long-dated government bonds and swap rates of equivalent maturity have risen to unusual levels (**Chart E**). And in corporate credit markets, there has been a persistently wider spread, or 'basis', between US corporate bond spreads and equivalent single-name credit default swap premia (**Chart F**).

Chart E Thirty-year US and UK government bond yields minus thirty-year swap rates

Sources: Bloomberg and Bank calculations.

Chart F Cash — CDS basis for US investment-grade corporate bonds[a]



Sources: JPMorgan and Bank calculations.

(a) Difference between spreads on US investment-grade corporate bonds and corresponding single-name CDS premia, aggregated across issuers. Data up to 30 June 2016.

Despite these developments, cost-based indicators of market liquidity for government and corporate bonds have shown little sign of deterioration…

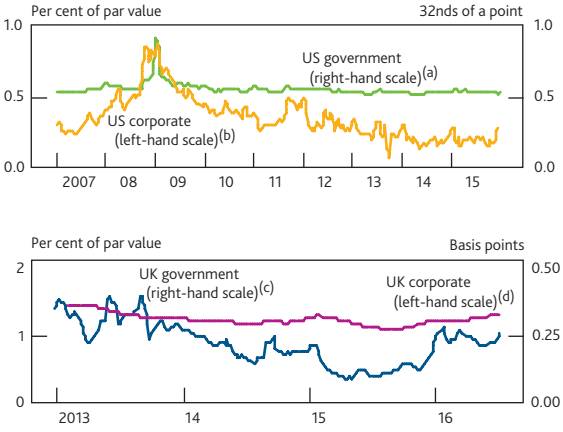
One commonly used headline measure of liquidity in a market is the bid-offer spread — the difference between the price at which an asset can be sold by a client (the bid) and that at which it can be purchased (the offer).

In principle, this spread should capture the compensation dealers require for warehousing securities on their balance sheet. That compensation will reflect both the cost dealers attribute to warehousing securities, and the time for which the securities are expected to be warehoused.

Other things equal, the bid-offer spread would be expected to rise if dealers are attributing a higher cost to holding inventories, in line with their reduced willingness to do so. However, if dealers and their clients are able to take steps to reduce the time dealers expect to hold assets on their balance sheet before finding a buyer, then the overall compensation may not need to rise significantly.

In some markets, bid-offer spreads may have kept low due to greater use of fast electronic trading. When trading is more frequent, this might minimise the need to warehouse securities for any length of time. In the US Treasury market, where more than a third of trading volume takes place on electronic exchange-like platforms, bid-offer spreads have shown little movement in recent years (**Chart G**).

Chart G US and UK government and corporate bond bid-offer spreads



Sources: Bloomberg, Federal Reserve Bank of New York, MarketAxess and Bank calculations.

(a) Average daily bid-offer spreads in the interdealer market for on-the-run ten-year Treasuries. Spreads are measured in 32nds of a point, where a point equals 1% of par. 21-day moving average. Based on BrokerTec data. Data up to end-2015.
(b) Realised bid-offer spreads computed daily for each bond as the difference between the average (volume-weighted) dealer-to-client buy price and the average (volume-weighted) dealer-to-client sell price, and then averaged across bonds on a volume-weighted basis. 21-day moving average. Based on TRACE data. Data up to 11 December 2015.
(c) Daily bid-offer spreads on generic ten-year UK government bond computed as the difference between end-of-day bid and ask yields. 22-day moving average.
(d) MarketAxess Bid-Ask Spread Index (BASI).

However, bid-offer spreads in other government and corporate bond markets also do not appear to have increased significantly relative to historical averages (**Chart G**).[1] In these markets, non-dealer intermediation is limited.

(1) See http://libertystreeteconomics.newyorkfed.org/2016/02/further-analysis-of-corporate-bond-market-liquidity.html#.V1funXJf2Uk.

…but this may be because reduced willingness to warehouse securities has been internalised by investors trading less and in smaller size.

This suggests that, to the extent there has been deterioration in market liquidity conditions, it has been internalised in dealer and investor behaviour, rather than reflected in prices.

In some markets, contacts have reported sellers breaking up large trades into smaller sizes to avoid having to trade at a large discount, or sellers being asked to delay trades until intermediaries have identified potential buyers. The average size of large trades in the UK and US bond markets has fallen in recent years (**Table 2**).

Table 2 Changes in average large trade size in bond markets[a][b][c][d]

	Percentage change in average large trade size since 2011	Percentage change in average large trade size since 2007
US investment-grade corporate bonds	-8	-30
US high-yield corporate bonds	-6	-8
UK government bonds	-11	–
UK corporate bonds	-3	–

Sources: FCA, FINRA and Bank calculations.

(a) US corporate bond large trade is defined as a trade with the par value of at least US$1 million.
(b) UK government bond large trade is defined as a trade with the par value of greater than £5 million.
(c) UK corporate bond large trade is defined as a trade with the par value of greater than £1 million.
(d) US large trade sizes are based on annual averages. UK large trade sizes are based on August-December averages.

Some measures of market activity also appear to have declined in recent years. Turnover, which is a measure of trading activity relative to market size, has fallen by around 35% since the end of 2011 in the gilt market. Amounts outstanding have increased during this period, but trade volumes also fell, by 9% (**Chart H**). Some of the decline in turnover may reflect the increasing role of 'buy and hold' investors, including central banks. However, turnover has fallen even if gilts held by the Bank of England (through its asset purchase programme) are excluded from the calculation. A similar finding holds for US Treasury markets.

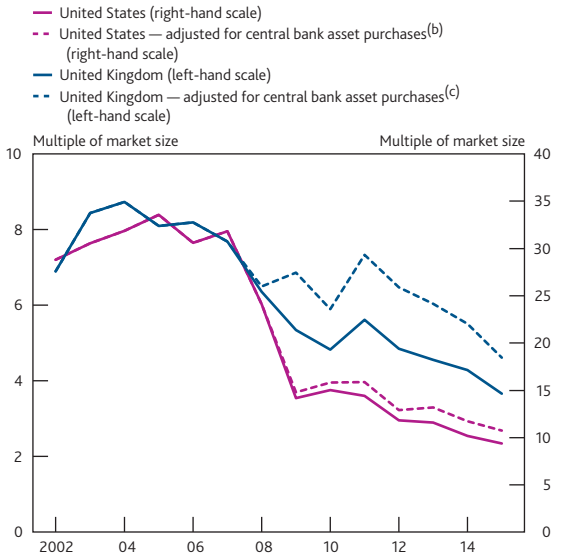
Reduced dealer activity may reflect changes in both economic and regulatory environments.

The structure of financial markets is continually evolving, reflecting a process of innovation, changes in the preferences of investors and regulatory influences. In recent years, dealers have faced fundamental changes in the economic and regulatory environment. It is difficult to disentangle the impact of each, but both appear to have had some impact on dealers' intermediation of markets and on market liquidity.

(i) The economic environment

The period since the crisis has been characterised by low global growth and low interest rates in many advanced economies, as well as asset purchases by central banks. Together, these factors have lowered expected returns on fixed-income assets in excess of risk-free interest rates. There is some evidence to suggest that these lower returns might have encouraged dealers to reduce their inventory holdings over the past few years (**Chart I**).

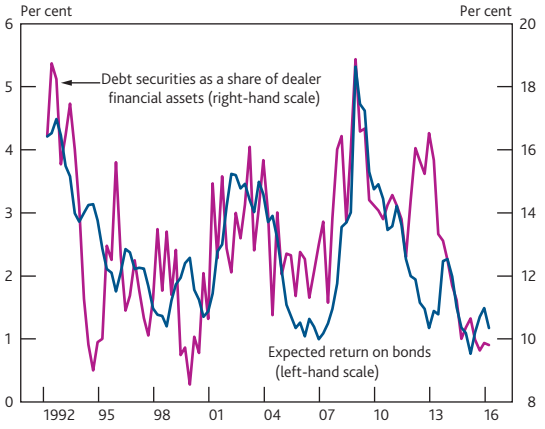
Chart H Turnover in UK and US government bond markets[a]



Sources: Bank of England, Debt Management Office, Federal Reserve, SIFMA and Bank calculations.

(a) Turnover for gilt and US Treasury markets is defined as annualised trading volume divided by amount outstanding. UK data are reported for the financial year.
(b) Amount outstanding is reduced by the amount of Treasuries purchased by the Federal Reserve as part of its Large-Scale Asset Purchase Programs.
(c) Amount outstanding is reduced by the amount of gilts purchased by the Bank of England's Asset Purchase Facility.

Chart I Share of US dealers' balance sheet allocated to debt securities versus expected return on bonds[a]



Sources: Federal Reserve Bank of New York, Thomson Reuters Datastream and Bank calculations.

(a) Expected return on bonds is calculated as the ten-year US Treasury term premium plus Moody's Baa-Aaa credit spread (difference between yields on Baa-rated and Aaa-rated US corporate bonds).

(ii) The regulatory environment

A number of implemented or planned post-crisis regulatory reforms relate directly to the activities of dealers in intermediating securities markets, including: new leverage ratio frameworks; the Liquidity Coverage Ratio; the Net

Stable Funding Ratio; and revised market risk capital requirements. It is difficult to identify definitively a causal link between the introduction, or announcement, of these new requirements and market developments. However, there are some indications that regulation, and the leverage ratio in particular, is at least one of the drivers of changes in funding and market liquidity.

In principle, leverage ratio requirements, as currently calibrated, would constrain only firms with relatively low risk-weighted assets on average. The impact will also depend on the business level at which it is applied. For the UK leverage ratio framework, this is currently at the consolidated level only.

Under a leverage ratio applied at the consolidated level, and assuming risk-weighted capital requirements are the constraint on a firm, repo activity would not consume as much capital as a comparable unsecured transaction, meaning that bid-offer spreads on repo activity can be kept low. However, if the leverage ratio were viewed as binding on individual business lines, this may create incentives for a dealer to increase margins, or reduce volumes, on lower-risk activities such as repo (Duffie (2016)).(1) If a dealer sought to maintain a target after-tax return on equity for repo activity of 10%, and assuming a 4% leverage ratio requirement was met for individual transactions, an increase in the gilt repo bid-offer spread of around 55 basis points would be needed relative to a counterfactual without a leverage constraint.

This estimate is conservative for at least two reasons. First, repo business is typically much lower risk than many other bank activities. So, in theory, the cost of equity — and the target return on equity — raised against repo as a standalone business line should be much lower than that of a major, diversified bank. Second, firms that are unconstrained by the leverage ratio at the consolidated level would not need to assume that the capital deployed to repo business is 4% of exposures. Nevertheless, there is some market and supervisory intelligence that dealers are considering the marginal impact of a leverage ratio requirement at the level of individual business lines when making decisions about how to allocate balance sheet to different activities (see Review of the FPC Direction on a leverage ratio requirement and buffers chapter).

As set out in the Review of the FPC Direction on a leverage ratio requirement and buffers chapter, in the light of evidence of declining market liquidity in some core financial markets and of a decline in availability of repo financing, which supports market functioning more broadly, **the FPC is restating its intention for its leverage ratio framework to be applied at consolidated level and not to individual activities.**

Some of any impact of regulation is likely to be transitory…
To the extent that dealers' business models are still adjusting to the new economic and regulatory environment, some of the impact on market conditions currently observed may be transitory.

There has already been evidence of dealers adjusting how they conduct their repo business to minimise regulatory costs. For example, from early 2014 (as regulators were beginning to announce new leverage frameworks), dealers have increased the proportion of repo loans that can be netted against repo borrowings with the same counterparty, thereby removing the loans from the leverage ratio exposure measure. This can be achieved, for example, by increasing the proportion of repo transactions that are centrally cleared, where multilateral netting can take place.

Furthermore, over time, new entrants and approaches to client financing and trading could emerge to take advantage of profitable opportunities in intermediating markets. For example, some exchanges are exploring new platforms to allow non-banks, such as pension funds, to execute repo transactions directly with each other. Similarly, central counterparties in some jurisdictions are considering allowing direct access to some non-banks for repo business.(2)

The extent of potential market adjustments and innovations is uncertain, and not all regulatory changes are implemented yet, so some impacts could persist.

…and the long-run costs are outweighed by the stability benefits of post-crisis regulations.
Market liquidity is integral to the resilience and effectiveness of the financial markets that serve the real economy. It follows that there will be some economic consequences of any enduring decline in market liquidity. The final impact of changes in market liquidity will depend on how market participants adjust to the post-crisis economic and regulatory environment.

In the government and corporate bond markets, the most direct way that the real economy would be affected by lower market liquidity is if this leads to an eventual increase in liquidity premia and this in turn increases the borrowing costs faced by companies in capital markets, reducing investment and the level of economic activity.

But to the extent such costs of regulation arise, they need to be counterbalanced by considering the wider benefits of improved financial system resilience conveyed by the

(1) Duffie, D (2016), 'Submission in response to US Treasury Notice seeking public comment on the evolution of the Treasury Market structure'; www.darrellduffie.com/uploads/policy/DuffieTreasuryRFIApril2016.pdf.
(2) For example, see www.eurexrepo.com/repo-en/info-center/publications/Select-Finance---New-trading-permission-for-buy-side-clients-as-of-July-4--2016/2632124.

regulatory reform package that reduces the likelihood and costs of a financial crisis.

For example, Brooke *et al* (2015)[1] assess the net benefits of higher bank capital, taking into account other regulatory changes such as liquidity requirements, structural reform and the recent development of a bank resolution regime and requirements for additional capacity to absorb losses in resolution. Based on their methodology, the net benefits of these regulations amount to an annual return of 0.5% of GDP every year,[2] before accounting for any costs incurred through lower levels of liquidity.[3]

Based on past relationships between the cost of bond market financing and investment spending in the United Kingdom, corporate bond spreads could rise by over 400 basis points before offsetting the estimated benefits of regulation.

Corporate bond liquidity premia are difficult to measure, but it is likely that these are only around 10–15 basis points higher in recent years compared to the early 2000s. Therefore, even after considering the potential impact of regulation on market-based finance, post-crisis reforms have resulted in a material net benefit for steady-state economic activity.

In addition, dealers themselves are less likely to be the source of, or amplify, market stress than in the past. In intermediating markets and warehousing securities, dealers can become exposed to counterparty and market risk. Resilient dealers are more likely to provide financing to clients and continue to intermediate markets, and are less likely to withdraw client financing, or sell assets, during times of stress.

The FPC considers it essential that any costs of regulation related to the level of market liquidity in normal conditions are viewed in the context of these benefits. Nevertheless, **the FPC judges it appropriate to adjust regulatory measures where opportunities exist to minimise their impact on the liquidity of core financial markets, without compromising their positive effect on resilience and stability.** The FPC has adopted this principle in its review of the leverage ratio framework (see Review of the FPC Direction on a leverage ratio requirement and buffers chapter).

The benefits of more resilient dealers for market liquidity can be increased by use of countercyclical requirements.

There is a risk that the same regulatory requirements that make dealers more resilient at the onset of stress could also become binding constraints on their activities as stress unfolds — as mark-to-market losses and higher costs erode dealers' voluntary capital buffers.

An important aspect of the United Kingdom's leverage ratio framework is the inclusion of material regulatory buffers that can be built up in normal market conditions and then released, or become usable, in stress. These include a countercyclical capital buffer and an additional buffer for systemically important banks.[4] The availability of these buffers during times of market stress implies a significant increase in the potential balance sheet capacity available for intermediating markets, while still conferring a minimum level of resilience on dealers. For example, releasing a 1 percentage point leverage ratio buffer could generate additional balance sheet capacity for the repo portfolios of the major UK dealers of more than £20 billion, nearly a third of the daily trading volume in the gilt repo market. Releasing a similar buffer for the largest 16 dealers globally, could create additional repo capacity of nearly £75 billion.

Without such buffers, the benefits of the leverage ratio framework are attenuated, because the extra resilience to losses cannot be used to maximum effect when needed. The danger is that, in response to losses, banks become concerned about meeting their regulatory constraint, and withdraw from activities such as repo and market-making, thereby aggravating shocks.

As set out in its Review of the FPC Direction on a leverage ratio requirement and buffer chapter, **the FPC strongly supports the inclusion of such buffers in any international leverage ratio standards.**

(1) Brooke, M, Bush, O, Edwards, R, Ellis, J, Francis, B, Harimohan, R, Neiss, K and Siegert, C (2015), 'Measuring the macroeconomic costs and benefits of higher UK bank capital requirements', *Bank of England Financial Stability Paper No. 35*; www.bankofengland.co.uk/financialstability/Documents/fpc/fspapers/fs_paper35.pdf.
(2) For comparison, Basel Committee on Banking Supervision (2010), 'An assessment of the long-term economic impact of stronger capital and liquidity requirements', estimates a net benefit of post-crisis regulation of around 170 basis points; www.bis.org/publ/bcbs173.pdf.
(3) The costs of regulatory reforms, in terms of higher commercial bank lending spreads, are estimated to be around 15 basis points of annual steady-state GDP.
(4) www.bankofengland.co.uk/financialstability/Documents/fpc/policystatement010715ltr.pdf.

Review of the FPC Direction on a leverage ratio requirement and buffers

In June 2015, the FPC directed the Prudential Regulation Authority (PRA) to require each major UK bank and building society to meet a leverage ratio requirement and hold buffers over that requirement. The leverage ratio refers to the share of the total value of a firm's assets and its other commitments (referred to as 'exposures') that is funded with high-quality capital capable of absorbing losses while a firm is a 'going concern'.

The FPC has a statutory obligation to review its Directions and to prepare a summary of its conclusions every twelve months. This chapter sets out the conclusions of the 2016 review, which are:

The leverage ratio framework remains an essential part of the framework for bank capital.(1) **Studies undertaken since the FPC issued its Direction have supported its calibration and the FPC continues to judge a leverage ratio framework to have material net benefits for financial stability.**

The FPC is restating its intention for its Direction to apply only at consolidated level, not at the level of individual activities.

The FPC judges that further review is needed — domestically and internationally — of recent marked reductions in the provision of repo financing in some advanced economies, which may in part be associated with leverage ratio requirements and buffers.

The FPC judges that **there would be merit in the future internationally agreed leverage ratio amending the current definition of total exposures in two respects:**

- Netting of cash receivables and cash payables from unsettled sales of securities. This will avoid unnecessarily discouraging activities that support market liquidity in core financial markets.

- Allowing initial margin posted by clients to reduce dealers' potential future exposures to a default of those clients in centrally cleared derivatives transactions. This will avoid discouraging central clearing of derivatives — a core element of the post-crisis reform agenda.

The FPC encourages the Basel Committee to review carefully any possible unintended effects of forthcoming leverage ratio standards on the ability of the banking system to cushion shocks and to draw on central bank liquidity facilities as necessary. In particular, the FPC:

- Continues to judge that any internationally agreed leverage ratio standard should contain material, usable, buffers that can be drawn on in stress. Without these, the leverage ratio framework could become the binding constraint on firms' activities in a stress.

- Intends to keep under review the possible effects of including holdings of central bank reserves in measures of exposures used to calculate banks' leverage ratios.

The FPC has contributed these conclusions, through the Bank of England, to the Basel Committee on Banking Supervision (BCBS), which is working on an international standard for leverage ratio requirements and buffers and is due to finalise the calibration in 2016.

As noted in its Policy Statement on its powers over leverage ratio tools,(2) the FPC will carry out an in-depth review of its leverage ratio framework in 2017.

The leverage ratio: definition and application

The leverage ratio is a simple indicator of the ability of a bank or building society to absorb losses. It is defined as the value of a firm's capital in relation to its total assets and other commitments (referred to as 'exposures'). The lower a firm's leverage ratio, the more it relies on debt — rather than capital — to fund its assets.

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

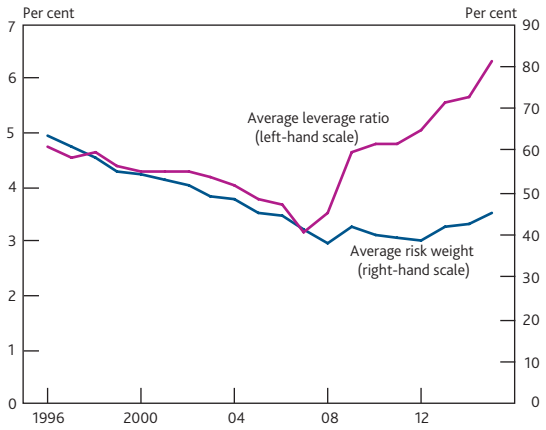
Unlike the risk-weighted capital framework, a leverage ratio does not seek to weight different exposures by estimates of their riskiness. Instead, the leverage ratio complements the risk-weighted capital framework by ensuring banks are protected against risks that are hard to model.

The example of the global financial crisis highlights the danger of relying only on the risk-weighted capital framework to

(1) In this chapter, the term 'banks' is used as shorthand for banks and building societies.
(2) www.bankofengland.co.uk/financialstability/Documents/fpc/policystatement010715ltr.pdf.

ensure there are adequate levels of capital in the banking system.(1) In the run-up to the crisis, leverage ratios were declining as the banking system was becoming more risky. However, bank capital assessed on a risk-weighted basis appeared healthy because average risk weights were falling (**Chart A**). The declines in risk weights reflected the use of models that placed too much weight on periods of stability and too little on periods in which assets performed poorly.

Chart A Average risk weights and leverage ratios since 1993(a)(b)



Sources: The Banker/TheBankerDatabase.com and Bank calculations.

(a) The series represent the weighted averages across the sample of 17 global banks. Leverage ratio measured as Tier 1 capital/assets.
(b) Sample includes Bank of America, Barclays, BNP Paribas, BNY Mellon, Citigroup, Commerzbank, Deutsche Bank, HSBC, ING, JPM, LBG, RBS, Santander, State Street, UBS, UniCredit and Wells Fargo.

A leverage ratio framework acts as a guardrail against this danger. This may be particularly important in periods of benign economic conditions when risk estimates might be falling and excessive balance sheet growth might otherwise take place.

In addition, the simplicity of the leverage ratio might make it more readily understood by market participants and more comparable across firms than risk-weighted measures.

A leverage ratio on its own would not be an adequate basis for setting bank capital requirements. For example, it might encourage risk-taking by banks since it does not specify that riskier exposures should be funded with more capital than other exposures. **The FPC believes that a robust framework for bank capital requires both a risk-sensitive capital framework and leverage ratio framework.**

Reflecting this, HM Treasury gave the FPC powers of Direction in April 2015 over:

- a minimum leverage ratio requirement;
- an additional leverage ratio buffer for systemically important banks; and
- a countercyclical leverage ratio buffer (CCLB).

The two buffers were designed to be drawn on in stressed conditions, allowing firms to absorb losses while minimising disruption to the provision of financial services, such as the supply of credit to the real economy. They mirror the buffers in the risk-weighted capital framework for systemically important firms and the countercyclical capital buffer.

Under the 2015 Direction, the FPC directed the PRA to implement in relation to each major UK bank and building society on a consolidated basis measures to:

- require it to hold sufficient Tier 1 capital to satisfy a minimum leverage ratio of 3%, of which at least 75% has to be common equity Tier 1 (CET1);
- secure that it ordinarily holds sufficient CET1 capital to satisfy a countercyclical leverage ratio buffer rate of 35% of its countercyclical capital buffer rate; and
- secure that, if it is a global systemically important institution (G-SII), it ordinarily holds sufficient common equity Tier 1 capital to satisfy a G-SII additional leverage ratio buffer rate of 35% of its G-SII buffer rate.

The FPC further recommended to the PRA that, in implementing the minimum leverage ratio requirement, it should specify that additional Tier 1 (AT1) capital should only count towards Tier 1 capital for these purposes if the instrument specifies a trigger event that occurs when the CET1 capital ratio of the institution falls below a figure of not less than 7%. This would help ensure that conversion takes place before the firm has breached its minimum requirements.

The PRA implemented the Direction and Recommendation with effect from 1 January 2016.

The FPC intends to direct the PRA to apply an additional leverage ratio buffer to institutions required to hold systemic risk buffers: that is, to ring-fenced banks and large building societies that hold more than £25 billion in deposits and

(1) Reflecting this, a number of studies have found that the leverage ratio was a better predictor of bank failure during the crisis than the risk-weighted capital ratio. See, for example, IMF (2009), *Global Financial Stability Report*, April; Demirgüç-Kunt, A, Detragiache, E and Merrouche, O (2010), 'Bank capital: lessons from the financial crisis', *Policy Research Working Paper Series No. 5473*; Brealey, R, Cooper, I and Kaplanis, E (2011), 'International propagation of the credit crisis: lessons for bank regulation', *Journal of Applied Corporate Finance*, Vol. 24, No. 4, pages 36–45; Mayes, D and Stremmel, H (2012), 'The effectiveness of capital adequacy measures in predicting bank distress', paper presented at 2013 Financial Markets & Corporate Governance Conference; Berger, A and Bouwman, C (2013), 'How does capital affect bank performance during financial crises?', *Journal of Financial Economics*, Vol. 109, No. 1, pages 146–76; Blundell-Wignall, A and Roulet, C (2013), 'Business models of banks, leverage and the distance-to-default', *OECD Journal: Financial Market Trends*, Vol. 2012, No. 2, pages 7–34; Hogan, T, Meredith, N and Pan, C (2013), 'Evaluating risk-based capital regulation', *Mercatus Center Working Paper Series No. 13-02*; Haldane, A and Madouros, V (2012), 'The dog and the frisbee', www.bankofengland.co.uk/archive/Documents/historicpubs/speeches/2012/speech596.pdf; Aikman, D, Galesic, M, Gigerenzer, G, Kapadia, S, Katsikopoulos, K, Kothiyal, A, Murphy, E and Neumann, T (2014), 'Taking uncertainty seriously: simplicity versus complexity in financial regulation', *Bank of England Financial Stability Paper No. 28*, www.bankofengland.co.uk/financialstability/Documents/fpc/fspapers/fs_paper28.pdf.

shares (excluding deferred shares) once ring-fencing requirements come into force in 2019.

As the FPC noted in its review in October 2014 and reiterated in its Policy Statement in 2015,(1) it expects to extend its leverage ratio framework to all PRA-regulated banks, building societies and investment firms in 2018.

The FPC is contributing conclusions from this 2016 review to international discussions to agree a common leverage ratio framework.

In January 2016, Central Bank Governors and Heads of Supervision agreed that a common leverage ratio requirement should comprise a minimum level of 3%.

The BCBS is consulting on the design of additional requirements for global systemically important banks as well as on refinements to the exposure measure to be used in the internationally agreed leverage ratio framework. A final calibration is expected to be agreed by 2017, ahead of implementation by 2018.

2016 review

The FPC considered in its 2016 review: the impact of implementation of the leverage ratio framework on the capital requirements of banks and building societies in scope of its Direction; new evidence on the appropriate calibration of leverage ratio requirements and buffers; how the leverage ratio might affect incentives for banks to perform different types of activities; its review of market liquidity (set out in the Developments in market liquidity chapter); and an assessment of how the leverage ratio framework might affect the behaviour of banks under stress.

Impact on capital requirements and calibration

On average, major UK banks currently face a leverage ratio requirement and buffers that amount to 3.1%. This will increase each year as buffers for systemic importance are phased into the risk-weighted capital framework. Furthermore, the FPC has explained its intent to set the UK countercyclical capital buffer rate at 1% of risk-weighted assets in a standard risk environment.(2)

Once all buffers are phased in, a bank subject to a 2.5% risk-weighted capital buffer for its systemic importance and a 1% countercyclical capital buffer will be expected to meet a leverage ratio of 4.2% (**Table 1**).

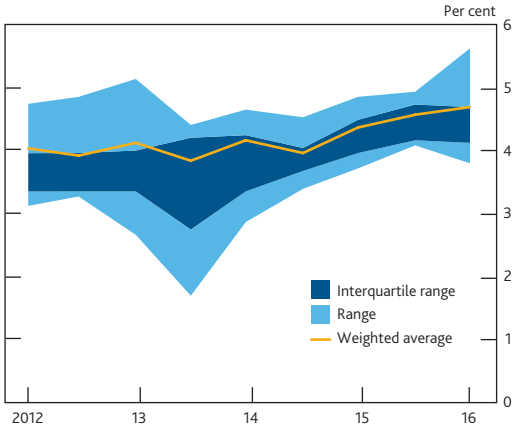
When the FPC issued its Direction in 2015, all major UK banks and building societies had leverage ratios in excess of current requirements and buffers of 3.1% (**Chart B**). Each major bank and building society also currently exceeds its fully phased in requirements and buffers.

Table 1 Example leverage requirement and buffers for a bank in 2019(a)(b)

	Tier 1 leverage ratio (per cent of exposure)
Minimum requirement	3
Systemic importance buffers (G-SII buffer and SRB)	35% * 2.5
Countercyclical capital buffer	35% * 1
Total	4.2

(a) Example ignores that a bank's institution-specific CCLB rate shall be rounded to the nearest 10 basis points. If rounded to 0.4, the total leverage ratio would be 4.3%.
(b) Example assumes that all exposures of the bank are in the United Kingdom for the purposes of determining the bank's countercyclical buffer rate.

Chart B Selected UK banks' leverage ratio(a)(b)



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

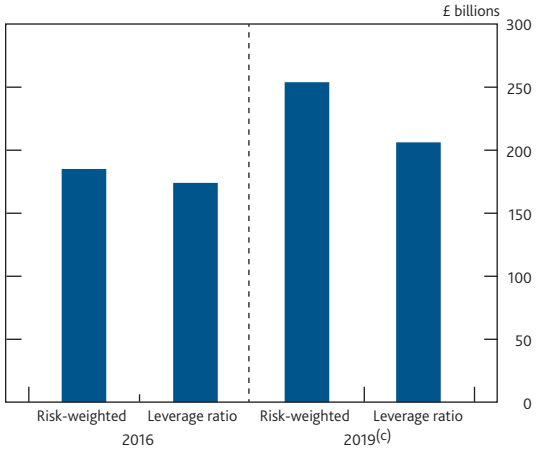
(a) Weighted by total assets.
(b) The Basel III leverage ratio corresponds to aggregate peer group Tier 1 capital over aggregate leverage ratio exposure. Up to end-2013, Tier 1 capital includes grandfathered capital instruments and the exposure measure is based on the Basel 2010 definition. From 2014 H1, Tier 1 capital excludes grandfathered capital instruments and the exposure measure is based on the Basel 2014 definition. The Basel III sample consists of Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK.

In aggregate, risk-weighted capital requirements and buffers are higher than the leverage ratio requirements and buffers in nominal terms. **Chart C** compares the two in 2016 and, assuming a 1% countercyclical capital buffer and fully phased-in systemic buffers, in 2019.

The FPC set the minimum leverage ratio requirement at 3% because this is consistent with domestic and international loss experience and would put the United Kingdom in line with emerging international standards. It set the countercyclical leverage ratio buffer rate and the additional leverage ratio buffer rate for systemic banks at 35% of the relevant risk-weighted buffer rate to preserve the average relationship between risk-weighted and leverage capital requirements. A minimum leverage ratio of 3% is approximately equivalent to 35% of an 8.5% risk-weighted capital ratio,(3) and is consistent with the average risk weight attributed to UK banks' balance sheets of around 35% (see Core indicator A.1).

(1) www.bankofengland.co.uk/financialstability/Documents/fpc/fs_lrr.pdf; and www.bankofengland.co.uk/financialstability/Documents/fpc/policystatement010715ltr.pdf.
(2) www.bankofengland.co.uk/financialstability/Documents/fpc/policystatement050416.pdf.
(3) The 8.5% Tier 1 risk-weighted requirement is equivalent to the 6% minimum Tier 1 ratio and 2.5% capital conservation buffer.

Chart C Selected UK banks' aggregate capital requirements and buffers in leverage and risk-weighted space[a][b]



Sources: PRA regulatory returns and Bank calculations.

(a) Sample consists of Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS, Santander UK and Standard Chartered.
(b) PRA buffer, which is a risk-weighted buffer only, is not included.
(c) Based on 2016 Q1 balance sheets.

Since the FPC Direction, a number of studies have assessed the appropriate level of bank capital. Bank of England analysis (Brooke *et al* (2015))[1] quantifies this by assessing the net benefits of higher bank capital. The benefits are assessed with reference to the costs of financial crises. The costs are assessed in terms of a higher cost of borrowing for the real economy, weaker investment and, in turn, economic output. This work also takes into account other areas of regulatory change such as liquidity requirements, structural reform and the recent development of a bank resolution regime and requirements for additional capacity to absorb losses in resolution.

The research suggests that the net benefits of higher bank capital are optimised for capital requirements in the range of 10%–14% of risk-weighted assets, corresponding to a leverage ratio of around 4%.

Similarly, Fender and Lewrick (2015)[2] estimate that the net benefits of additional bank resilience against higher lending costs are highest when the leverage ratio is in the range of 4%–5%. Grill, Hannes Lang and Smith (2015),[3] meanwhile, weigh the potential costs associated with increased incentives to take risk once banks are bound by the leverage ratio and compare them to the overall increase in loss-absorbing capacity attributable to higher capital, finding that there are net benefits in introducing a leverage ratio requirement and buffers in the range of 3%–5%.

Having reviewed these new studies, the FPC judges that its overall calibration remains appropriate and continues to deliver substantial net benefits for financial stability.

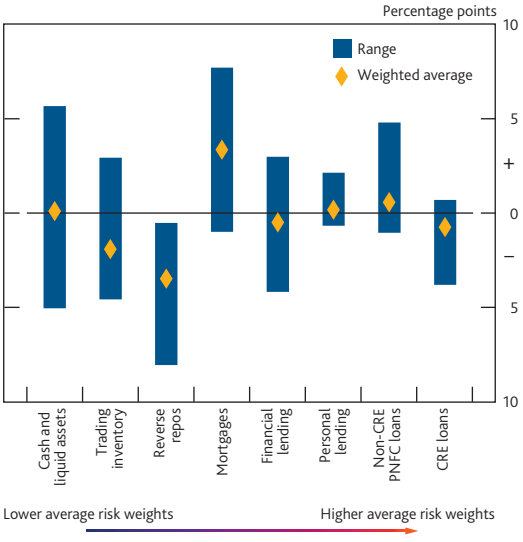
Impact on activities

Empirical research looking at banks across the European Union found that firms responded to a leverage ratio regime with a very moderate shift towards activities that attracted higher risk weights. The effect was measured from the point at which firms were required to disclose, rather than to meet, a leverage ratio requirement (Grill, Hannes Lang and Smith (2015)).

The FPC has reviewed evidence on the balance of banking sector activity since end-2012. Even though PRA rules implementing the FPC Direction did not come into force until January 2016, it was at this point that major UK banks and building societies were first asked to disclose their leverage ratios, and was shortly before the FPC recommended that the PRA ensure firms have a credible plan for meeting the Basel III capital and leverage ratio standards, including the 3% minimum leverage ratio requirement.

Chart D shows changes to selected UK banks' balance sheets since end-2012. This suggests there has been a shift away from some activities considered low risk, such as trading inventory and repo business, towards others — such as certain types of mortgage lending — that typically attract slightly higher risk weightings. This pattern is also evident over shorter time periods.

Chart D Changes to selected UK banks' assets as a proportion of their balance sheets (end-2012 to end-2015)[a]



Sources: Published accounts and Bank calculations.

(a) Sample includes Barclays, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK.

(1) Brooke, M, Bush, O, Edwards, R, Ellis, J, Francis, B, Harimohan, R, Neiss, K and Siegert, C (2015), 'Measuring the macroeconomic costs and benefits of higher UK bank capital requirements', *Bank of England Financial Stability Paper No. 35*; www.bankofengland.co.uk/financialstability/Documents/fpc/fspapers/fs_paper35.pdf.
(2) Fender, I and Lewrick, U (2015), 'Calibrating the leverage ratio', *BIS Quarterly Review*, December, pages 43–58; www.bis.org/publ/qtrpdf/r_qt1512f.htm.
(3) Grill, M, Hannes Lang, J and Smith, J (2015), 'The leverage ratio, risk-taking and bank stability', preliminary version; www.eba.europa.eu/documents/10180/1018121/Grill,%20Lang,%20Smith+-+The+Leverage+Ratio,%20Risk-Taking+and+Bank+Stability+-+Paper.pdf.

These changes probably reflect a range of factors. However, they are, to some extent, consistent with firms applying the leverage ratio framework to individual business lines rather than at the consolidated level as intended. Market and supervisory contacts support this interpretation.

Under a leverage ratio applied at the consolidated level, and with risk-weighted capital requirements as the binding constraint, repo activity would not consume much capital. However, if the leverage ratio framework were viewed as binding on individual business lines, banks could hold up to an estimated 55 basis points more capital to fund their repo business. As Duffie (2016) has described, this may reduce incentives for shareholders to conduct activities that attract low risk weights.(1)

It is possible that a reduction in low-risk activities is a transitional effect, as firms adjust to managing and allocating capital across business lines to comply with both the risk-weighted capital and leverage ratio frameworks.

Nevertheless, in the light of evidence of declining market liquidity in some core financial markets and of a decline in availability of repo financing (see the Developments in market liquidity chapter), **the FPC is restating its intention for its leverage ratio framework to be applied at consolidated level and not to individual activities.**

The FPC also judges that, given the role of repo financing in supporting market functioning more broadly, further review is needed — domestically and internationally — of the impact of the leverage ratio and other factors on repo markets and of the consequences of those impacts for the real economy.

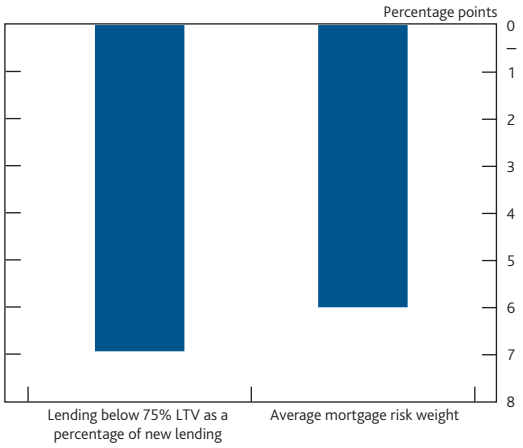
Mortgage lending

The FPC also reviewed evidence for any shift in the mix of business within banks' mortgage lending, away from lower loan to value (LTV) lending and towards higher LTV lending.

The data available do not suggest that the leverage ratio has had a material impact on the mortgage market since end-2012. Lending at LTV ratios below 75% has fallen but it has fallen by more for banks and building societies for which the leverage ratio has been relatively less binding than risk-weighted capital requirements. And the average riskiness of banks' mortgage lending (proxied by their average mortgage risk weight) has fallen (**Chart E**).

Rather than reflecting an impact of the leverage ratio framework, it is likely that the fall in the share of mortgage lending at lower LTV ratios over this period reflects a more generalised pickup in risk appetite after the financial crisis.

Chart E Changes in mortgage provision and risk profile (end-2012 to end-2015)(a)(b)



Sources: Product Sales Data, regulatory returns and Bank calculations.

(a) Changes are from end-2012, just before major UK banks and building societies started disclosing their leverage ratios, to end-2015.
(b) Sample includes Barclays, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK for lending volumes. Also includes Co-operative Banking Group for risk weights.

Supporting market liquidity and client clearing

The FPC has also reviewed the incentives created by some specific aspects of the measure of exposures to which the leverage ratio framework is applied. It has focused, in particular, on two areas central to the ongoing Basel Committee consultation on the leverage ratio: (a) the treatment of outright sales and purchases of securities and (b) the treatment of collateral when clearing members access derivatives through central counterparties (CCPs) on behalf of clients.

The FPC judges that the current treatment of outright purchases and sales of securities may act to discourage market-making activity and, in view of recent developments in market liquidity, judges that there would be merit in revising the treatment.

Consider a simple example of a bank acting as market maker. The bank buys a security for £100 from client A and sells it to client B on the same day. At the end of the trading day, it does not hold the security but, while settlement of the two trades is pending, it includes on its balance sheet a £100 cash payable that it is due to transfer to client A (a liability). It is also awaiting £100 cash to settle the sale of the security to client B, which is recorded as a £100 cash receivable (an asset). Under the current exposure definition, the cash that is pending from client B is counted as a £100 exposure. To meet a leverage ratio of 3%, this requires the bank to hold £3 of capital, reducing, at the margin, incentives to conduct this market-making activity.

(1) Duffie, D (2016), 'Submission in response to US Treasury Notice seeking public comment on the evolution of the Treasury Market structure'; www.darrellduffie.com/uploads/policy/DuffieTreasuryRFIApril2016.pdf.

This could be avoided if the cash receivable could be offset by the cash payable. In this simple example, the leverage exposure measure due to these trades over the settlement period would be zero.

This change would increase dealers' incentives to make markets while maintaining the resilience of dealers. During the settlement period, the only risk to which the dealer is exposed is that either counterparty might fail to settle the trade. But if the trades are settled on a delivery versus payment basis, settlement failure would mean the dealer was left with either the cash (if client A failed to deliver the security) or the security (if client B failed to make its cash payment). They would only face a loss in the unlikely event of a trade failing and a sharp movement in prices occurring over the settlement period.

The FPC judges that there would be merit in any internationally agreed leverage ratio standard permitting banks to net cash receivables relating to unsettled sales against cash payables relating to unsettled purchases, where trades are settled through a delivery versus payment or equivalent settlement system.

The FPC also considered the treatment of client derivatives cleared through CCPs. CCPs are entities that interpose themselves between two counterparties in financial transactions such as derivative trades. This reduces counterparty risk, simplifies otherwise complex webs of exposures and improves risk management.

Recognising these benefits, G20 leaders agreed that a move to greater central clearing should be an important part of the 'post-crisis' reforms of derivatives markets. In particular, they mandated that standardised over-the-counter derivatives should be cleared through CCPs. But many institutions that need to purchase such derivatives cannot, or find it uneconomic to, deal directly with the CCP. Instead, they choose to become clients of clearing members, which are typically banks.

When a bank intermediates a derivative trade on behalf of a client as a clearing member, it incurs a potential future exposure (PFE).

This captures potential losses that the bank might face if the client owes payment on the derivative in the future and the client defaults. In that scenario, the clearing member would still have to pay the CCP, suffering a loss.

Clients typically post collateral, so-called 'initial margin', against this risk. Under current BCBS proposals, however, the bank has to count the full value of the PFE towards their leverage exposure and cannot use the initial margin posted by the client to reduce it.

The clearing member faces no significant risk from relying on initial margin when certain conditions are met. In particular, initial margin should be posted with a third party such as a custodian or other entity and should be appropriately segregated, ensuring that the dealer can use it to absorb losses when the client defaults.

Not allowing this initial margin to reduce PFE could lead clearing members to raise fees for client clearing of derivatives or withdraw from providing client clearing services.

Prudent hedging of risk enhances the resilience of the real economy and financial system, and derivatives are often the most efficient hedge instrument for a given risk. Allowing client initial margin to reduce the PFE would reduce the capital cost of client clearing to leverage-constrained dealers. This would support the availability and affordability of clearing services to real-economy clients and other financial institutions and help them hedge risks effectively, without compromising the resilience of dealers.

The FPC judges that there would be merit in any internationally agreed leverage ratio standard allowing initial margin posted by clients to reduce banks' potential exposures to a default of those clients in centrally cleared derivative transactions, provided appropriate safeguards are in place.

Impact of the leverage ratio in stressed conditions

There is limited empirical evidence of the impact of leverage ratio requirements and buffers in stressed conditions. Nevertheless, the FPC judges that there may be opportunities to enhance the beneficial effects of the leverage ratio by improving its impact under stress.

The FPC encourages the Basel Committee to review carefully any possible unintended effects of forthcoming leverage ratio standards on the ability of the banking system to cushion shocks and to draw on central bank liquidity facilities as necessary.

Buffers in the leverage ratio framework

The FPC notes the importance of material *and usable* leverage ratio buffers that can be drawn on to absorb stress without compelling banks to restrict the provision of financial services, such as the supply of credit to the real economy.

Without such buffers, the benefits of the leverage ratio framework are attenuated, because the extra resilience cannot be used to maximum effect when needed. The danger is that, in response to losses, banks become concerned about meeting their regulatory constraints and withdraw from activities such as repo and market-making, thereby aggravating shocks.

The FPC's leverage ratio framework, and the PRA's implementation of the framework, includes material and usable buffers.

The FPC strongly supports the inclusion of such buffers in any international leverage ratio standards. In particular, the FPC urges the inclusion of a countercyclical leverage ratio buffer that can be cut in a stress. And for other buffers, such as the additional leverage ratio buffer for systemic banks, restrictions on distributions when buffers are drawn on should not be mandatory or automatic.

There must also be a high degree of certainty that buffers and minimum requirements will prove loss absorbing in practice. This indicates that buffers should be composed of CET1 capital and that the share of AT1 instruments eligible to meet the minimum leverage ratio requirement should be no more than 25%, as specified in the FPC's 2015 Direction.

Treatment of central bank reserves

The FPC has also considered how the inclusion of central bank reserves in the leverage ratio could have unintended consequences.

Central bank reserves are a unique asset class because they are the ultimate settlement asset. If matched by liabilities in the same currency, they typically do not represent an 'exposure' to risk, including the risk of currency redenomination (the central bank equivalent of default risk). Therefore, there is no direct benefit to funding holdings of reserves with capital.

Moreover, their inclusion can affect the ability of the banking system to cushion shocks and to draw on central bank liquidity facilities, as necessary, to maintain the supply of credit and support for market functioning. In circumstances where central bank balance sheets expand (for example, through increased use of liquidity facilities), regulatory leverage requirements can effectively tighten.

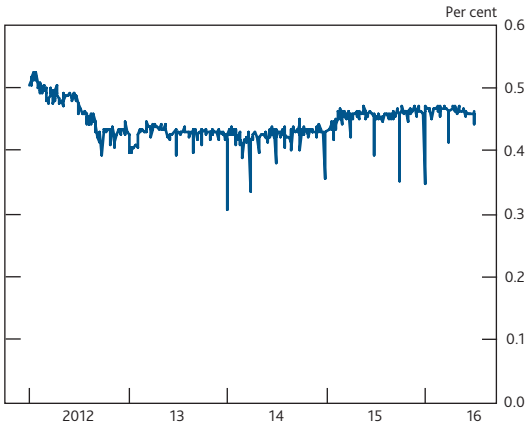
Any increase in the supply of reserves must be held by banks in aggregate. Other things equal, therefore, leverage exposure measures would increase and leverage ratios would fall.(1) This could act as a disincentive to access central bank liquidity facilities. It could also prompt banks to deleverage by shedding assets, cutting their supply of credit, or withdrawing from other activities, including support for market functioning. These effects would take place at precisely the same time the central bank is aiming to support market functioning and economic activity.

The FPC intends to keep under review the possible effects of including holdings of central bank reserves in measures of exposures used to calculate banks' leverage ratios.

Some evidence for this type of effect comes from banks' behaviour in wholesale money markets. Wholesale deposit-taking is not directly affected by the leverage ratio, as deposits represent a liability rather than an asset. But any new deposit will create an asset for the bank receiving the deposit — typically reflected, in the first instance, by an increase in central bank reserves. This in turn increases the bank's leverage exposure.

Evidence from brokered wholesale deposit markets suggest that UK banks typically reduce their presence close to reporting dates for leverage ratios, reflected in sharp falls in the rates offered. This effect has become more pronounced since 2013, when firms first began to disclose leverage ratios (**Chart F**).

Chart F SONIA rate(a)



Sources: Wholesale Markets Brokers' Association and Bank calculations.

(a) The SONIA rate is the sterling overnight index average. The index tracks actual market overnight funding rates.

Competition and international comparison

In its assessment of the costs and benefits of a leverage ratio framework, the Committee has taken into account the impact of the framework on competition in the UK banking sector.

A market can be thought of as competitive when suppliers offer a choice of products or services on the most attractive, sustainable terms to customers, where customers can make informed decisions, and where firms can enter, expand and exit from the market. The impact of the leverage ratio on competition in domestic markets is likely to be limited as most firms face a larger risk-weighted constraint than leverage constraint. It may nevertheless have an impact on competition at the margin in a number of ways.

The leverage ratio may aid competition by reducing the barriers to entry and expansion for firms that do not have permissions to use internal models to risk weight some of their assets. Internal models typically allow greater recognition of

(1) This would not happen where assets are purchased directly from banks.

collateral netting and bank-specific loss history, leading to lower risk weights than those based on standardised approaches. The leverage ratio limits the ability of banks to reduce capital in line with lower risk weights. It may therefore reduce differences in capital requirements between firms with internal models and those following a standardised approach, where the former are likely to be relatively more constrained by the leverage ratio.

A number of other countries also operate leverage ratio regimes (**Table 2**). This suggests that the FPC's regime is in line with the approach taken by other regulators of internationally active banks.

Table 2 Summary of existing and proposed leverage ratio frameworks

Jurisdiction	Status	Minimum (per cent)	Buffers	Enforcement date
Canada	Existing	3		2015
Switzerland	Existing	3	2% for G-SIIs	Applied to systemically important banks from 2019[a]
United States	Existing	3	2% for G-SIIs	2018
China	Existing	4		Applicable to G-SIIs as of 2013, rest from 2016
Australia	Recommendation	3–5		
Denmark	Proposed	3		
Netherlands	Proposed	3	1% for systemically important banks	Applicable to four largest banks from 2018
Sweden	Proposed	3	2% for G-SIIs	2018

(a) This is a proposed revision to the current Swiss leverage ratio framework.

Annex 1: Previous macroprudential policy decisions

This annex lists FPC Recommendations and Directions 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 13/Q1/6 refers to the sixth Recommendation made following the 2013 Q1 Committee meeting.

Recommendations and Directions implemented since the previous *Report*

15/Q2/1(D)	**Direction on the leverage ratio**	Implemented
15/Q2/2	**Role of AT1 in minimum leverage ratio requirements**	Implemented

The FPC directs the PRA to implement in relation to each major UK bank and building society on a consolidated basis measures to:

- **require it to hold sufficient Tier 1 capital to satisfy a minimum leverage ratio of 3%;**
- **secure that it ordinarily holds sufficient Tier 1 capital to satisfy a countercyclical leverage ratio buffer rate of 35% of its institution-specific countercyclical capital buffer rate, with the countercyclical leverage ratio buffer rate percentage rounded to the nearest 10 basis points;**
- **secure that if it is a global systemically important institution (G-SII) it ordinarily holds sufficient Tier 1 capital to satisfy a G-SII additional leverage ratio buffer rate of 35% of its G-SII buffer rate.**

The minimum proportion of common equity Tier 1 that shall be held is:

- **75% in respect of the minimum leverage ratio requirement;**
- **100% in respect of the countercyclical leverage ratio buffer; and**
- **100% in respect of the G-SII additional leverage ratio buffer.**

Common equity Tier 1 may include such elements that are eligible for grandfathering under Part 10, Title 1, Chapter 2 of Regulation (EU) No 575/2013 as the PRA may determine.

The FPC recommends to the PRA that in implementing the minimum leverage ratio requirement it specifies that additional Tier 1 capital should only count towards Tier 1 capital for these purposes if the relevant capital instruments specify a trigger event that occurs when the common equity Tier 1 capital ratio of the institution falls below a figure of not less than 7%.

In December 2015, the PRA published a Policy Statement and rules on 'Implementing a UK leverage ratio framework' (PS27/15). These rules require major UK banks and building societies to satisfy a minimum leverage ratio and to secure that they hold a countercyclical leverage ratio buffer, and are now in force. These rules also use a definition of Tier 1 capital that implements the FPC's Recommendation about the role of additional Tier 1 in minimum leverage ratio requirements.

The PRA has now secured that UK G-SIIs satisfy an additional leverage ratio buffer by setting out its requirements of the relevant firms pursuant to section 55M of the Financial Services and Markets Act (2000) (FSMA).

Recommendations and Directions currently outstanding

14/Q3/1	**Powers of Direction over housing instruments**	Action under way

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 (LTV) and debt to income limits in respect of mortgages on owner-occupied properties came into force in April 2015, and the FPC has published a Policy Statement describing how it intends to use these tools.(1)

In December 2015, HM Treasury published a consultation on granting the FPC powers of Direction over buy-to-let lending, along with a draft statutory instrument and impact assessment. The consultation closed in March, and the Chancellor's most recent remit and recommendations letter to the FPC noted that HM Treasury would bring forward a response to the consultation, including final secondary legislation, in due course.(2) The FPC will prepare a statement of its policy for the use of powers of Direction ahead of any such powers being approved by Parliament.

15/Q2/3	**CBEST vulnerability testing**	Action under way

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.

Twenty-three core firms have now completed CBEST cyber vulnerability tests (up from ten at the time of the December 2015 *Report*), with a further eight in the process of testing. Those firms which have completed CBEST tests have implemented individual cyber resilience action plans to address any vulnerabilities identified. Work by the UK authorities (the Bank, the FCA and HM Treasury) to develop proposals for embedding CBEST testing into the supervisory toolkit and firms' own regular risk management processes is also under way.

Alongside its Recommendation on CBEST testing, in June 2015, the FPC endorsed a broader work programme by the authorities to enhance financial system cyber resilience to: review the list of core firms to ensure that it captures those most critical to financial stability in the event of a major cyber attack; define and develop a clear set of capabilities that will enhance the financial system's resilience and improve its ability to respond to and recover from a major cyber attack; and develop co-operation with international authorities. This work programme is under way. In 2016 Q2, the FPC received a progress update on the work programme. It will receive a further update in 2016 H2.

16/Q2/1	**Distribution of capital to meet 'fair shares' of systemic buffers**	Action under way

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. The explanation for the Recommendation was set out in the Record of that meeting.(3) The PRA will consult on its planned approach to implement this Recommendation later this year. The FPC will review progress against the Recommendation after this date.

(1) www.bankofengland.co.uk/financialstability/Pages/fpc/policystatements.aspx.
(2) www.bankofengland.co.uk/financialstability/Documents/fpc/letters/chancellorletter160316.pdf.
(3) www.bankofengland.co.uk/publications/Pages/Records/fpc/2016/record1605.aspx.

16/Q2/2	**Reduction of PRA supervisory buffers reflecting risks that would be captured by a UK countercyclical capital buffer rate**	Action under way

The FPC recommends to the PRA that, where existing PRA supervisory buffers of PRA-regulated firms reflect risks that would be captured by a UK countercyclical capital buffer rate, it reduce those buffers, as far as possible and as soon as practicable, by an amount of capital which is equivalent to the effect of a UK countercyclical capital buffer rate of 0.5%.

The PRA Board has agreed to implement this Recommendation. This means that three quarters of banks, accounting for 90% of the stock of UK economy lending, will, with immediate effect, have greater flexibility to maintain their supply of credit to the real economy. Other banks will no longer see their regulatory capital buffers increase over the next nine months, increasing their capacity to lend to UK households and businesses too.

Consistent with this, the FPC supports the expectation of the PRA Board that firms do not increase dividends and other distributions as a result of this action. The FPC will keep progress against this Recommendation under review.

Other FPC policy decisions which remain in place

The table below sets out 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 reducing the UK CCyB rate from 0.5% to 0% of banks' UK exposures with immediate effect. Absent any material change in the outlook, and given the need to give banks the clarity necessary to facilitate their capital planning, the FPC expects to maintain a 0% UK CCyB rate until at least June 2017. The rate is reviewed on a quarterly basis. The United Kingdom has also 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 2.5%.

Prevailing FPC Recommendation on mortgage affordability tests

When assessing affordability in respect of a potential borrower, UK mortgage lenders are required to have regard to any prevailing FPC Recommendation on appropriate interest rate stress tests. This requirement is set out in FCA rule MCOB 11.6.18(2).(2) In June 2014, the FPC made the following Recommendation (14/Q2/1):

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).

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 is practicable.

The PRA and the FCA have published their respective approaches to implementing this Recommendation: the PRA has issued a Policy Statement, including rules,(3) and the FCA has issued general guidance.(4)

(1) www.bankofengland.co.uk/financialstability/Pages/fpc/ccbrates.aspx.
(2) http://fshandbook.info/FS/html/FCA/MCOB/11/6.
(3) www.bankofengland.co.uk/pra/Documents/publications/ps/2014/ps914.pdf.
(4) www.fca.org.uk/news/fg14-08.

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 1 July 2016)
Non-bank balance sheet stretch[d]						
1 Credit to GDP[e]						
Ratio	117.1%	152.1%	86.9%	172.2%	141.3%	143.2% (2016 Q1)
Gap	6.4%	6.2%	-25.7%	20.8%	-24.4%	-19.2% (2016 Q1)
2 Private non-financial sector credit growth[f]	10.1%	9.8%	-3.1%	22.8%	2.2%	4.0% (2016 Q1)
3 Net foreign asset position to GDP[g]	-2.3%	-10.3%	-22.4%	18.5%	-18.3%	-6.8% (2016 Q1)
4 Gross external debt to GDP[h]	183.0%	309.9%	114.2%	398.0%	321.6%	300.2% (2016 Q1)
of which bank debt to GDP	*120.9%*	*195.0%*	*78.6%*	*267.6%*	*174.5%*	*166.1% (2016 Q1)*
5 Current account balance to GDP[i]	-1.7%	-2.2%	-7.2%	0.8%	-5.4%	-6.9% (2016 Q1)
Conditions and terms in markets						
6 Long-term real interest rate[j]	3.10%	1.27%	-1.14%	5.29%	-0.35%	-1.14% (1 July 2016)
7 VIX[k]	19.1	12.8	10.5	65.5	14.4	17.8 (1 July 2016)
8 Global corporate bond spreads[l]	84 bps	84 bps	74 bps	482 bps	136 bps	151 bps (1 July 2016)
9 Spreads on new UK lending						
Household[m]	480 bps	352 bps	285 bps	840 bps	657 bps	655 bps (Apr. 2016)
Corporate[n]	104 bps	97 bps	82 bps	392 bps	232 bps	234 bps (Dec. 2015)
Bank balance sheet stretch[o]						
10 Capital ratio						
Basel II core Tier 1[p]	6.6%	6.3%	6.2%	12.3%	n.a.	n.a.
Basel III common equity Tier 1[q]	n.a.	n.a.	n.a.	n.a.	11.4%	12.3% (2016 Q1)
11 Leverage ratio[r]						
Simple	4.7%	4.1%	2.9%	6.6%	5.9%	6.6% (2015 H2)
Basel III (2014 proposal)	n.a.	n.a.	n.a.	n.a.	4.4%	4.9% (2015 H2)
12 Average risk weights[s]	53.6%	46.4%	34.6%	65.4%	37.4%	36.5% (2015 H2)
13 Return on assets before tax[t]	1.0%	1.1%	-0.2%	1.5%	0.5%	0.4% (2015 H2)
14 Loan to deposit ratio[u]	114.5%	132.4%	95.9%	133.3%	95.9%	96.2% (2015 H2)
15 Short-term wholesale funding ratio[v]	n.a.	24.3%	10.5%	26.5%	13.5%	10.5% (end-2015)
of which excluding repo funding	*n.a.*	*15.6%*	*4.5%*	*15.7%*	*6.2%*	*4.5% (end-2015)*
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 2015 Q1: AE, JP, KY	In 2016 Q1: —
17 CDS premia[y]	12 bps	8 bps	6 bps	298 bps	75 bps	124 bps (July 2016)
18 Bank equity measures						
Price to book ratio[z]	2.14	1.97	0.52	2.86	1.01	0.59 (July 2016)
Market-based leverage ratio[aa]	9.7%	7.8%	1.9%	15.7%	6.0%	4.1% (July 2016)

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 1 July 2016)
Bank balance sheet stretch[o]						
1 Capital ratio						
Basel II core Tier 1[p]	6.6%	6.3%	6.2%	12.3%	n.a.	n.a.
Basel III common equity Tier 1[q]	n.a.	n.a.	n.a.	n.a.	11.4%	12.3% (2016 Q1)
2 Leverage ratio[r]						
Simple	4.7%	4.1%	2.9%	6.6%	5.9%	6.6% (2015 H2)
Basel III (2014 proposal)	n.a.	n.a.	n.a.	n.a.	4.4%	4.9% (2015 H2)
3 Average mortgage risk weights[ab]	n.a.	n.a.	14.2%	22.4%	15.6%	14.2% (2015 H2)
UK average mortgage risk weights[ac]	n.a.	n.a.	11.0%	15.8%	11.8%	11.0% (2015 H2)
4 Balance sheet interconnectedness[ad]						
Intra-financial lending growth[ae]	12.0%	13.0%	-18.8%	45.5%	-7.0%	-18.8% (2015 H2)
Intra-financial borrowing growth[af]	14.1%	13.7%	-21.5%	29.5%	-4.5%	-16.9% (2015 H2)
Derivatives growth (notional)[ag]	37.7%	34.2%	-25.9%	52.0%	-18.9%	-19.1% (2015 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 2015 Q1: CH, HK, KY, SG		In 2016 Q1: —
Non-bank balance sheet stretch[d]						
6 Credit growth						
Household[ai]	10.3%	11.2%	-0.6%	19.6%	2.4%	3.4% (2016 Q1)
Commercial real estate[aj]	15.3%	18.5%	-9.7%	59.8%	-5.0%	0.0% (2016 Q1)
7 Household debt to income ratio[ak]	100.1%	141.8%	78.2%	150.5%	131.1%	132.5% (2016 Q1)
8 PNFC debt to profit ratio[al]	237.0%	297.0%	157.0%	407.4%	274.7%	285.5% (2016 Q1)
9 NBFI debt to GDP ratio (excluding insurance companies and pension funds)[am]	56.4%	122.0%	14.0%	176.8%	142.4%	128.6% (2016 Q1)
Conditions and terms in markets						
10 Real estate valuations						
Residential price to rent ratio[an]	100.0	151.1	66.9	160.6	133.9	139.6 (2016 Q1)
Commercial prime market yields[ao]	5.4%	4.0%	3.8%	7.3%	4.1%	3.9% (2016 Q1)
Commercial secondary market yields[ao]	8.9%	5.8%	5.4%	10.9%	7.4%	6.7% (2016 Q1)
11 Real estate lending terms						
Residential mortgage LTV ratio (mean above the median)[ap]	90.6%	90.6%	81.6%	90.8%	86.6%	86.7% (2016 Q1)
Residential mortgage LTI ratio (mean above the median)[ap]	3.8	3.8	3.6	4.1	4.0	4.1 (2016 Q1)
Commercial real estate mortgage LTV (average maximum)[aq]	77.6%	78.3%	60.0%	79.6%	63.6%	62.6% (2015 H2)
12 Spreads on new UK lending						
Residential mortgage[ar]	81 bps	50 bps	34 bps	361 bps	176 bps	171 bps (Apr. 2016)
Commercial real estate[as]	137 bps	135 bps	119 bps	422 bps	263 bps	264 bps (2015 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 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, 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 Countercyclical 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, derived from the Bank's index-linked government liabilities curve. Sources: Bloomberg and Bank calculations.
(k) The VIX is a measure of market expectations of 30-day volatility as conveyed by S&P 500 stock index options prices. Series starts in 1990. One-month moving average. Sources: Bloomberg and Bank calculations.
(l) 'Global corporate bond spreads' refers to 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.
(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 until August 2009, after which spreads are taken relative to OIS of matching maturity. 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. Series starts in 1997. Sources: Bank of England, CML, 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 lending rates over Bank Rate; and, as a proxy for the rate at which banks lend to large, non-CRE corporates, UK investment-grade company bond spreads over maturity-matched government bond yields (adjusted for any embedded option features such as convertibility into equity). Weights based on relative volumes of new lending. 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, Innovation and Skills 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 (between 2005 and 2015); 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 (note a discontinuity due to the introduction from 2005 of IFRS accounting standards, which tends to reduce reported leverage ratios thereafter). The Basel III (2010) series corresponds to aggregate peer group Tier 1 capital (including grandfathered instruments) 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 series are annual until end-2012 and half-yearly afterwards. 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. Sample excludes National Australia Bank in the 2015 H2 data point. Series begins in 1992 and is annual until end-2012 and half-yearly afterwards. 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. Sample includes National Australia Bank between 2005 and 2015 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. Sample includes National Australia Bank between 2005 and 2015 H1. Nationwide results in 2015 H2 are not available yet. 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. Sample includes National Australia Bank between 2005 and 2015 H1. Nationwide results in 2015 H2 are not available yet. Sources: Published accounts and Bank calculations.
(w) This indicator highlights the countries where UK-owned 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), Hong Kong (HK), India (IN), Japan (JP), Republic of Korea (KR), Cayman Islands (KY), Luxembourg (LU), Malaysia (MY), Netherlands (NL), Singapore (SG), Taiwan (TW), United Arab Emirates (AE), 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 in 2015. Series starts in 2003. Includes Nationwide from July 2003, and National Australia Bank between 2005 and 2015 H1. Sources: Markit 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 8 February 2016, 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 8 February 2016. Northern Rock/Virgin Money is excluded from 2008. Series starts in 2000. Sources: Thomson Reuters Datastream, published accounts and Bank calculations.
(ab) Sample excludes Bank of Ireland; Britannia; National Australia Bank; Northern Rock; Virgin Money; 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 2008 and is updated half-yearly. Sources: PRA regulatory returns and Bank calculations.
(ac) Sample excludes Bank of Ireland; Britannia; National Australia Bank; Northern Rock; Virgin Money; 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 include National Westminster, Ulster Bank and RBS. Series starts in 2008 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 2015 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 2015 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 2015 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 nominal growth rate of 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 disposable income. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM). 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. Gross debt is measured as loans, debt securities and liabilities through currency and deposits. The NBFI sector includes all financial corporations apart from MFIs. 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, 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 IPD's measures of rental income and capital values. Source: Investment Property Databank (IPD UK).
(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 Database 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 until August 2009, after which spreads are taken relative to OIS of matching maturity. 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, CML and Bank calculations.
(as) The CRE lending spread is the average of rates across major CRE lenders relative to Bank Rate. Series starts in 2002. Sources: Bank of England, 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 1 July 2016)
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%	86.6%	86.7% (2016 Q1)
Owner-occupier mortgage LTI ratio (mean above the median)[d]	3.8	3.8	3.6	4.1	4.0	4.1 (2016 Q1)
Buy-to-let mortgage LTV ratio (mean)[e]	n.a.	n.a.	70.9%	78.6%	71.5%	71.5% (2016 Q1)
2 Household credit growth[f]	10.3%	11.2%	-0.6%	19.6%	2.4%	3.4% (2016 Q1)
3 Household debt to income ratio[g]	100.1%	141.8%	78.2%	150.5%	131.1%	132.5% (2016 Q1)
of which: mortgages[h]	*70.8%*	*103.8%*	*50.7%*	*113.2%*	*100.9%*	*101.7% (2016 Q1)*
of which: owner-occupier mortgages[i]	*80.6%*	*95.0%*	*67.2%*	*100.0%*	*85.0%*	*84.1% (2016 Q1)*
Conditions and terms in markets						
4 Approvals of loans secured on dwellings[j]	97,916	119,039	26,695	134,873	64,447	67,042 (May 2016)
5 Housing transactions[k]	140,636	139,062	51,940	242,799	101,850	89,700 (May 2016)
Advances to homemovers[l]	48,985	59,342	14,300	93,500	26,200	22,200 (Apr. 2016)
% interest only[m]	53.3%	31.0%	1.8%	81.3%	2.7%	1.8% (Apr. 2016)
Advances to first-time buyers[l]	39,179	33,567	8,500	55,800	23,500	25,100 (Apr. 2016)
% interest only[m]	52.1%	24.0%	0.0%	87.9%	0.4%	0.0% (Apr. 2016)
Advances to buy-to-let purchasers[l]	10,128	14,113	3,600	28,700	8,600	4,200 (Apr. 2016)
% interest only[n]	n.a.	n.a.	50.0%	74.3%	68.4%	74.3% (2016 Q1)
6 House price growth[o]	1.8%	2.2%	-5.6%	7.0%	1.4%	1.3% (May 2016)
7 House price to household disposable income ratio[p]	2.9	4.5	2.1	4.7	4.2	4.4 (2016 Q1)
8 Rental yield[q]	5.8%	5.1%	4.8%	7.6%	5.1%	5.0% (May 2016)
9 Spreads on new residential mortgage lending						
All residential mortgages[r]	81 bps	50 bps	34 bps	361 bps	176 bps	171 bps (Apr. 2016)
Difference between the spread on high and low LTV residential mortgage lending[r]	18 bps	25 bps	1 bps	293 bps	162 bps	81 bps (May 2016)
Buy-to-let mortgages[s]	n.a.	n.a.	61 bps	398 bps	291 bps	260 bps (2016 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 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 Database 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 of 70%, 82.5%, 92.5% and 97.25% respectively. Series starts in 2007. Sources: Bank of England and Bank calculations.
(f) The twelve-month nominal growth rate of 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 disposable income. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM). Sources: ONS and Bank calculations.
(h) Total debt secured on dwellings as a percentage of a four-quarter moving sum of disposable income. The household disposable income series is adjusted for FISIM. Source: ONS and Bank calculations.
(i) Total debt associated with owner occupier mortgages divided by the four-quarter moving sum of disposable income. The household disposable income series is adjusted for FISIM. 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 unregulated 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. Sources: Halifax/Markit, Nationwide and Bank calculations.
(p) The ratio is calculated using gross disposable income of the UK household and non-profit sector per household as the denominator. Aggregate household 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 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 (ARLA), LSL Property Services plc and Bank calculations.
(r) The overall spread on residential mortgage lending is a weighted average of quoted mortgage rates over safe 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 years of matching maturity until August 2009, after which spreads are taken relative to OIS of the same maturity. 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. 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 unregulated 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 risk-free interest rates by the number of buy-to-let fixed-rate mortgage products offered at these maturities. The risk-free rates are gilts of the appropriate maturity until August 2008, after which the OIS is used. Series starts in 2007. Sources: Bank of England, Moneyfacts and Bank calculations.

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Glossary and other information

Glossary of selected data and instruments

CDS – credit default swap.
ERI – exchange rate index.
GDP – gross domestic product.
OIS – overnight index swap.
RPI – retail prices index.

Abbreviations

AT1 – additional Tier 1.
BCBS – Basel Committee on Banking Supervision.
BIS – Bank for International Settlements.
CBEST – UK Government's National Cyber Security Programme.
CCyB – countercyclical capital buffer.
CCLB – countercyclical leverage ratio buffer.
CCP – central counterparty.
CET1 – common equity Tier 1.
CML – Council of Mortgage Lenders.
CPMI – Committee on Payments and Market Infrastructures.
CRD IV – Capital Requirements Directive.
CRE – commercial real estate.
DSR – debt-servicing ratio.
DTA – deferred tax asset.
DTI – debt to income.
ECB – European Central Bank.
EME – emerging market economy.
ESMA – European Securities and Markets Authority.
EU – European Union.
FCA – Financial Conduct Authority.
FDI – foreign direct investment.
FDSF – Firm Data Submission Framework.
FISIM – financial intermediation services indirectly measured.
FMI – financial market infrastructure.
FPC – Financial Policy Committee.
FSA – Financial Services Authority.
FSB – Financial Stability Board.
FSMA – Financial Services and Markets Act (2000).
FTSE – Financial Times Stock Exchange.
G-SII – global systemically important insurer.
HMRC – Her Majesty's Revenue and Customs.
ICMA – International Capital Market Association.
IFRS – International Financial Reporting Standard.
IMF – International Monetary Fund.
IOSCO – International Organization of Securities Commissions.
LCR – Liquidity Coverage Ratio.
LTI – loan to income.
LTV – loan to value.
MCOB – Mortgages and Home Finance: Conduct of Business sourcebook.
MFI – monetary financial institution.
MSCI – Morgan Stanley Capital International Inc.
NBFI – non-bank financial institution.
NIIP – net international investment position.
NPL – non-performing loan.
ONS – Office for National Statistics.
OTC – over the counter.
PFE – potential future exposure.
PNFC – private non-financial corporation.
PPP – purchasing power parity.
PRA – Prudential Regulation Authority.
RBS – Royal Bank of Scotland.
RICS – Royal Institution of Chartered Surveyors.
RoE – return on equity.
SME – small and medium-sized enterprise.
SRB – systemic risk buffer.
S&P – Standard & Poor's.
TMTPs – transitional measures on technical provisions.
WEO – IMF *World Economic Outlook*.

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