Financial Stability Report

June 2018 | Issue No. 43

BANK OF ENGLAND

On 10 July 2018, the average annual growth rate of bank lending to corporates between 1997 and 2006 in **Table A.1** on page 3 was corrected to 8.4% from 4.8%.

BANK OF ENGLAND

Financial Stability Report

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The primary responsibility of the Financial Policy Committee (FPC), a committee of the Bank of England, is to contribute to the Bank of England's financial stability objective. 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 main risks to UK 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, unless otherwise stated, uses data available as at 15 June 2018.

PowerPoint™ versions of the *Financial Stability Report* charts and Excel spreadsheets of the data underlying most of them are available at
www.bankofengland.co.uk/financial-stability-report/2018/june-2018

Contents

Executive summary

The Financial Policy Committee (FPC) aims to ensure the UK financial system is resilient to, and prepared for, the wide range of risks it could face — so that the system can serve UK households and businesses in bad times as well as good.

The FPC continues to judge that, apart from those related to Brexit, domestic risks remain standard overall. In recent months there has been some reduction in domestic risk appetite, although it remains strong.

- Levels of household and corporate debt in the UK relative to incomes remain materially below their 2008 levels. Overall, credit growth remains broadly in line with the growth in nominal GDP and debt-servicing burdens are low.
- In recent months, corporate bond spreads have increased and mortgage loan spreads have widened a little.
- Non-bank lending to riskier companies has been expanding rapidly. But lending by banks has been muted, limiting the increase in overall corporate leverage and the effect on banks' resilience.
- Consumer credit continues to expand rapidly. The Committee acted last year to ensure lenders are able to absorb severe losses on consumer credit.
- Although banks' risk appetite in mortgage lending has increased over the past few years, weak demand has kept mortgage credit growth modest. The FPC's previous mortgage market measures have insured against a marked deterioration in lending standards.

Risks from global vulnerabilities remain material and have increased.

- Increases in Italian government bond yields suggest rising risks in the euro area and underline the vulnerabilities created by high public debt levels and interlinkages between banks and sovereigns in a currency union.
- Tightening conditions in US dollar funding markets are increasing risks in some emerging markets.
- Trade tensions have intensified. Debt levels in China remain highly elevated. And corporate leverage in the US has continued to increase.

The 2017 stress test showed that the UK banking system is resilient to severe domestic, global and market shocks. The FPC is maintaining the UK countercyclical capital buffer (CCyB) rate at 1%.

- Major UK banks' capital strength has tripled since 2007, with an aggregate Tier 1 capital ratio of 17% in 2018 Q1.
- The FPC remains alert to any increase in risks faced by the UK banking system. Financing conditions in debt markets, which remain accommodative, could promote further risk-taking in the UK and elsewhere. The UK is more vulnerable to a reduction in foreign investor appetite for UK assets, as the share of capital inflows vulnerable to refinancing risk has risen. And material global risks could spill over to the UK.
- The FPC will conduct as normal a comprehensive assessment of the resilience of the UK banking system in the 2018 stress test and review the adequacy of the 1% CCyB rate.

The FPC continues to judge that the UK banking system could support the real economy through a disorderly Brexit.

- The 2017 stress test encompassed a wide range of UK macroeconomic outcomes that could be associated with Brexit. As it has set out previously, the FPC judges that Brexit risks do not warrant additional capital buffers for banks.

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

The FPC is continuing to monitor preparations to mitigate disruption to financial services that could arise from Brexit. Progress has been made but material risks remain.

- An implementation period has been agreed, subject to finalisation and ratification of the Withdrawal Agreement between the EU and the UK, elements of which are still in negotiation.

- The EU (Withdrawal) Bill has been passed by Parliament.

- The UK Government has committed to legislate, if necessary, to put in place a temporary permissions regime to enable EU-based financial companies to continue to provide financial services to UK end-users. Once enacted, this will mitigate a number of risks of disruption to UK customers.

- The biggest remaining risks of disruption are where action is needed by both UK and EU authorities, such as ensuring the continuity of existing derivative contracts. As yet the EU has not indicated a solution analogous to a temporary permissions regime. The FPC welcomes the establishment in April of a technical working group, chaired by the European Central Bank and Bank of England, on risk management in the area of financial services in the period around 30 March 2019.

The FPC is setting standards for how quickly critical financial companies must be able to restore vital services following a cyber attack. It plans to test them against these in cyber stress tests.

- Firms have primary responsibility for their ability to resist and recover from cyber attack.

- The impact tolerances being established by the FPC will be based on the time after which disruption to services could cause material economic impact.

- Working with others, especially the National Cyber Security Centre, the Bank will test that firms would be able to meet the FPC's standards for recovering services.

Continued reliance of financial markets on Libor poses a risk to financial stability that can be reduced only through a transition to alternative rates. The FPC will monitor progress and report regularly.

- The scarcity of unsecured deposit transactions poses a risk to the medium-term sustainability of Libor. The FCA has secured agreement of Libor panel banks to submit to Libor until end-2021.

- Good progress has been made to establish potential alternatives to Libor. In the UK, SONIA (the sterling overnight index average) is the preferred alternative. And two important market-led consultation exercises are due to be carried out soon.

- However, as long as the outstanding stock of contracts maturing after 2021 that reference Libor continues to increase, so will associated medium-term financial stability risks.

Overview of risks to UK financial stability and the UK countercyclical capital buffer rate decision

The FPC judges that: apart from those related to Brexit, domestic risks remain in the standard region overall; risks stemming from global debt levels remain material and have increased; and the UK banking system could continue to support the real economy through a disorderly Brexit.

The FPC has decided to set the UK countercyclical buffer (CCyB) rate at 1%, unchanged since November 2017. This is consistent with its published strategy of setting the UK CCyB rate in the region of 1% in a standard domestic risk environment. The UK CCyB rate will be 1% with binding effect from 28 November 2018.

The FPC remains alert to any increase in risks faced by the UK banking system. In recent months there has been some reduction in domestic risk appetite, although it remains strong. Financing conditions in debt markets, which remain accommodative, could promote further risk-taking in the UK and elsewhere. The UK is more vulnerable to a reduction in foreign investor appetite for UK assets, as the share of capital inflows vulnerable to refinancing risk has risen. And material global risks could spill over to the UK. The FPC will conduct as normal a comprehensive assessment of the resilience of the UK banking system in the 2018 stress test and review the adequacy of the 1% CCyB rate.

The FPC assesses the risks the financial system could face in an economic stress.

The FPC's risk assessment covers:

- The sensitivity of the financial system to economic shocks. To assess this, the FPC monitors the size and riskiness of the financial system's balance sheet.
- The size of economic and financial shocks the system could face. For example, the FPC monitors the risk that highly indebted households could amplify any economic downturn, or that falls in foreign investor sentiment for UK assets could drive a fall in domestic demand.

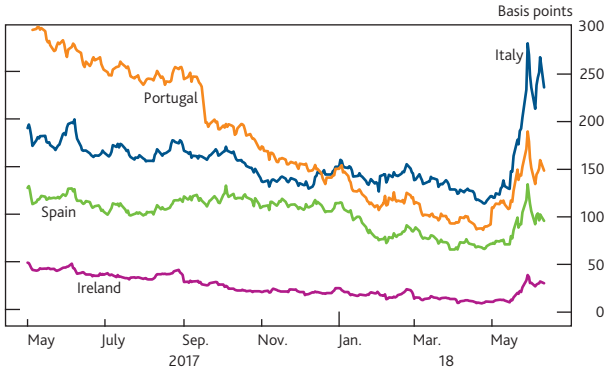
The FPC uses this assessment to build the resilience of the financial system to the wide range of risks it could face — so that the system can serve UK households and businesses in bad times as well as good.

Risks from global vulnerabilities remain material and have increased.

Financial vulnerabilities in China remain elevated. Economic growth in China over the past few years has been supported by

Chart A.1 Government bond spreads rose sharply in Italy in late May

Spreads between yields on government bonds of selected euro-area countries and German bunds[a]

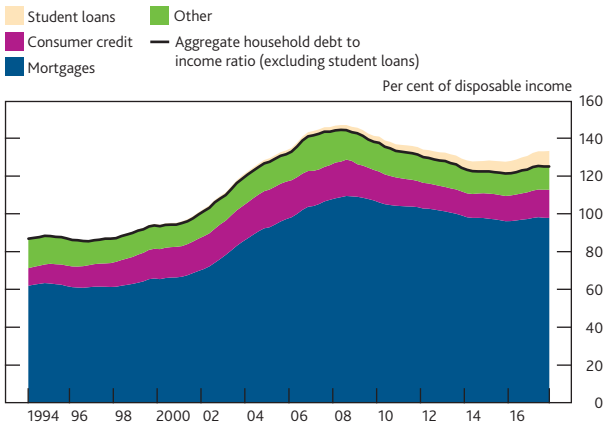


Sources: Thomson Reuters Datastream and Bank calculations.

(a) Last data point is 15 June 2018.

Chart A.2 Household debt relative to income is high, but materially below its 2008 peak

UK household debt to income ratio[a]



Sources: Bank of England, ONS and Bank calculations.

(a) All data are seasonally adjusted unless otherwise stated. Household sector liabilities as a percentage of four-quarter moving sum of household disposable income. Household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM). Household sector liabilities exclude unfunded pension liabilities and financial derivatives associated with non-profit institutions serving households (NPISH), and are non seasonally adjusted. The stock of outstanding income-contingent student loans has been projected to 2017 Q4 using historical growth rates. Other household sector liabilities include loans to unincorporated businesses (for example, sole traders), loans to NPISH, and household bills that are due but not yet paid.

large increases in borrowing. Although the Chinese authorities have taken action to improve financial regulation and are pursuing some other policies aimed at reducing corporate leverage, this has so far led to only a small fall in private non-financial sector debt as a share of GDP.

Political uncertainty in Italy led to sharp falls in Italian asset prices and a rise in government bond spreads in late May (**Chart A.1**). Asset prices have since partly recovered but the episode suggests rising risks in the euro area and underlines the vulnerabilities created by high public sector debt and interlinkages between banks and sovereigns in a currency union. Although direct UK banking exposures to Italy are low, if financial strains were to spread across the euro area, these would pose a material risk to UK financial stability (see Other global vulnerabilities chapter).

Stronger global investor risk appetite for riskier debt in recent years has allowed a build-up of debt in emerging market economies (EMEs) and in the US corporate sector.

Many EMEs have built up external debt relative to GDP in the past few years, although generally to levels below their earlier peaks. Some EMEs have high levels of government or corporate debt denominated in US dollars. Rising US bond yields since the beginning of the year and strengthening of the US dollar since April have tightened conditions in US dollar funding markets and increased risks in these EMEs.

In the US, corporate leverage has increased from 254% of earnings in 2015 Q1 to 290% in 2018 Q1, and is now similar to pre-crisis levels. At the same time, underwriting standards have deteriorated: the share of leveraged lending with weaker covenants increased to over 80% in 2018, from less than 5% in 2010 (see Global debt market conditions chapter).

The FPC continues to judge that, apart from those related to Brexit, domestic risks remain in the standard region overall.

Credit conditions are a core element of the overall risk environment. High levels of debt, particularly when built rapidly with looser underwriting standards, leave the financial system at risk of incurring a higher level of losses, by: (i) making lenders more exposed to losses; and (ii) raising the size of economic shocks banks could face, as highly indebted borrowers can, in some cases, cut spending sharply in a downturn.

The stock of UK private non-financial sector debt relative to income remains materially below its 2008 levels. For example, the total stock of UK household debt (excluding student loans) as a proportion of household income has fallen by around 20 percentage points, from 144% at its peak in 2008 to 125% in 2017 Q4 (**Chart A.2**).[1] Over the same period, the stock of

(1) These estimates exclude student loans from the measure of household debt. Repayments on UK student loans are income-contingent, unlike most other forms of household debt. Including student debt, household debt to income ratio is 133%, 19 percentage points below its peak.

Table A.1 UK credit, nominal GDP, nominal household income and corporate profit growth

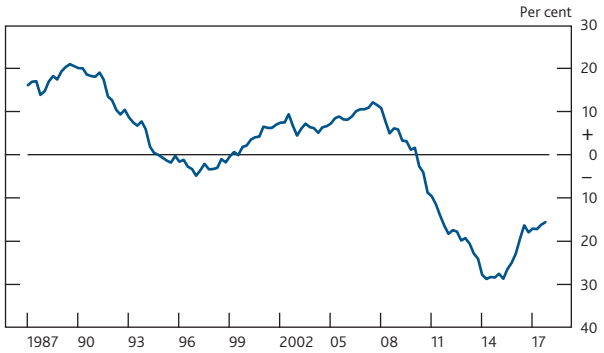
	Average 1997–2006 (per cent)	12 months to (per cent)		
		2017 Q4	2018 Q1	April 2018
Nominal GDP	5.0	3.1	2.6	
Household income	4.4	1.6		
Corporate profits	3.9	4.3	Data unavailable	
Total credit[a][d]	8.9	4.7		
Corporate credit[d]	7.3	6.2		
Bank lending[d]	8.4	2.4	3.0[c]	2.0[c]
Market-based[d]	6.6	8.9	Data unavailable	
Leveraged loans[e]	Data unavailable	21	39	28
Lending to individuals[b]	10.4	4.1	4.0	4.1
Mortgages	9.8	3.3	3.3	3.4
Consumer credit	13.6	9.5	8.6	8.8

Sources: Bank of England, LCD, an offering of S&P Global Market Intelligence, ONS and Bank calculations.

(a) Excluding student loans.
(b) Excluding student loans and other household sector liabilities.
(c) Based on lending from UK banks only.
(d) Non seasonally adjusted.
(e) Change in the outstanding value of UK leveraged loans is estimated — using S&P LCD data — as gross issuance of leveraged loans, less: (i) any loans labelled as refinancing, provided that the issuing firm has an existing, potentially active loan in the S&P data set available to be refinanced; and (ii) maturing loans, provided they have not been assumed to be refinanced earlier.

Chart A.3 The private non-financial sector credit to GDP gap is negative

UK private non-financial sector credit to GDP gap[a]



Sources: ONS, Revell, J and Roe, A (1971), 'National balance sheets and national accounting — a progress report', *Economic Trends*, No. 211, UK Finance and Bank calculations.

(a) Credit is defined as debt claims on the UK private non-financial sector. This includes all liabilities of the household and not-for-profit sector except for the unfunded pension liabilities and financial derivatives of the not-for-profit sector, and private non-financial corporations' (PNFCs) loans and debt securities excluding derivatives, 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/financial-stability for further explanation of how this series is calculated.

UK corporate debt as a proportion of corporate earnings has fallen by around 75 percentage points (**Chart A.5**).

Annual credit growth (excluding student loans) in the year to 2017 Q4 was 4.7%, broadly in line with nominal GDP growth (**Table A.1**). Within this, non-bank (market-based) lending to corporates expanded rapidly, but growth of mortgage and corporate lending by banks had been modest and has remained so in 2018.

The UK's credit to GDP gap, which measures the difference between the ratio of credit to GDP and a simple statistical estimate of its long-term trend, remains significantly negative, at -16% (**Chart A.3**).(2)

The cost of servicing debt for households and businesses remains low, supported by current low interest rates. For example, households' interest and mortgage principal repayments relative to disposable income were 7.5% in 2017 Q4, below their average in 1997–2006 of 8.7%. And the proportion would only rise to around its 1997–2006 average even if interest rates were to rise by 100 basis points (**Chart A.4**). The share of households with mortgage debt-servicing ratios above 40% (the percentage beyond which households are typically much more likely to experience repayment difficulties) stands at 1.3%. It would reach its 1997–2006 average level if interest rates increased by 200 basis points.

The FPC continues to judge that the UK banking system could support the real economy through a disorderly Brexit.

The 2017 stress test encompassed a wide range of UK macroeconomic outcomes that could be associated with Brexit. As it has set out before, the FPC judges that the UK banking system could continue to support the real economy through a disorderly Brexit and therefore, that Brexit risks do not warrant additional capital buffers for banks.

The economic scenario in the 2017 stress test was more severe than the global financial crisis. It involved deep simultaneous recessions in the UK and global economies, large falls in asset prices and a separate stress of misconduct costs. In the scenario, UK unemployment rose to 9.5%, UK residential property prices fell by 33% and UK Bank Rate peaked at 4%.

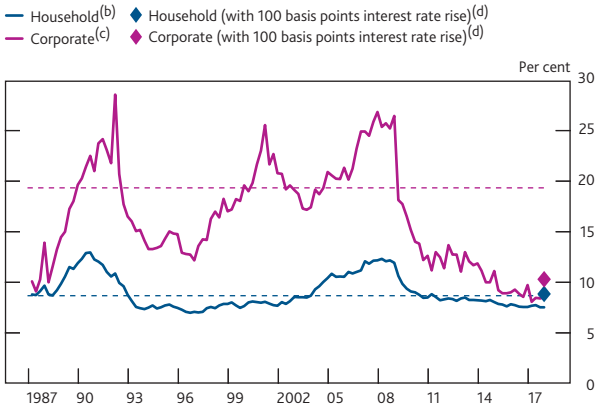
The FPC had previously identified some signs of increased domestic risk appetite. In recent months, there has been some reduction in domestic risk appetite, but it remains strong.

In March, the FPC identified some signs of rising domestic risk appetite. They had not translated into rapid credit growth overall but could signal a future deterioration in the risk

(2) This indicator has been strongly correlated with past financial crises. But as the FPC has previously noted, the long-term trend on which it is based currently gives undue weight to the rapid build-up in credit prior to the global financial crisis, which proved to be unsustainable.

Chart A.4 Aggregate debt-servicing costs are low

Aggregate household and corporate debt-servicing ratios[a]

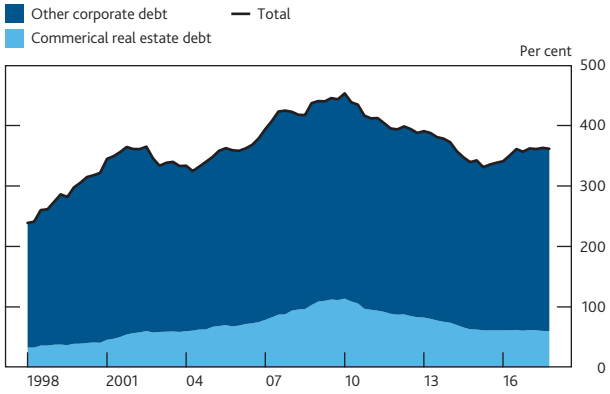


Sources: ONS and Bank calculations.

(a) Dashed lines show 1997–2006 averages.
(b) Calculated as interest payments plus mortgage principal repayments as a proportion of nominal household post-tax income. Household income has been adjusted to take into account the effects of FISIM. Mortgage interest payments before 2000 are adjusted to remove the effect of mortgage interest relief at source.
(c) Private non-financial corporate sector interest payments as a percentage of gross operating surplus, excluding the alignment adjustment and the effects of financial intermediation services indirectly measured (FISIM).
(d) Diamonds show the debt-servicing ratio if interest rates rise by 100 basis points and pass-through to loan rates is full and immediate, and income is unchanged.

Chart A.5 UK corporate leverage remains materially below its 2008 level but has begun to rise

Bank staff estimate of the UK private non-financial corporate sector's gross debt to earnings ratio[a][b]



Sources: Bank of England, Deloitte, London Stock Exchange, ONS, Preqin, S&P LCD, Thomson Reuters Datastream and Bank calculations.

(a) 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. Gross operating surplus is adjusted for FISIM.
(b) The chart shows Bank staff estimate of corporate debt including additional sources of market-based finance, not fully captured in National Statistics. See Global debt market conditions chapter for more details.

environment if they led to higher leverage in the household and corporate sectors. These signs of rising risk appetite included risks stemming from consumer credit growth and risks relating to household indebtedness and credit supply conditions in the mortgage market. The FPC also noted that credit had become more readily available for non-financial companies over the past two years — especially for large companies with access to capital markets. But there have been signs in recent months of some reduction in domestic risk appetite.

UK corporate leverage remains materially below its 2008 level. Non-bank lending to riskier companies has been expanding rapidly but bank lending has been muted.

UK corporate leverage remains below its 2008 level (**Chart A.5**). Much of the pre-crisis increase and post-crisis reduction in corporate leverage was driven by the commercial real estate sector. Corporate leverage has now begun to rise, mainly driven by non-commercial property companies borrowing in debt markets. Excluding commercial real estate, corporate leverage is around its average level over the past 15 years.

In common with other bond markets, yields on sterling corporate bonds have suggested a high degree of investor risk appetite for some time. When adjusted for lower credit rating, term premia and longer duration, the joint compensation investors have been demanding for interest rate and credit risk has been close to zero over the past two years (**Chart A.6**).

This has created the conditions for rapid growth of non-bank finance of corporates over the past few years, especially through leveraged loans. These are loans to firms who are typically highly indebted, have a non-investment grade rating or are owned by a private equity sponsor. Gross issuance of leveraged loans by UK non-financial companies reached a record level of £38 billion in 2017. Leveraged loans tend not to remain on banks' balance sheets. A large share is typically repackaged into collateralised loan obligations or sold to credit funds. For example, these non-bank investors acquired around 70% of loans syndicated in the European market in 2018 Q1.

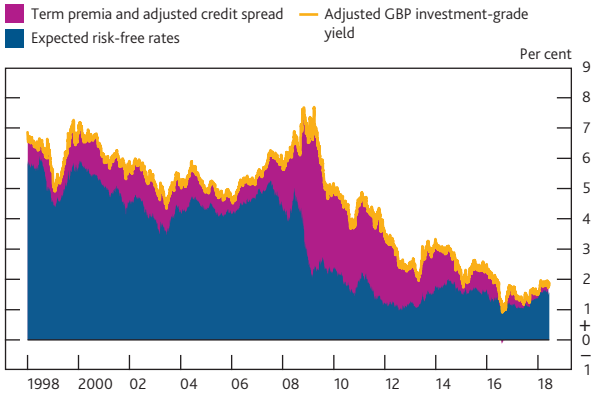
Leveraged lending has continued to increase rapidly in 2018, reaching around £26 billion in the year to June (**Chart A.7**). This recent growth in leveraged loan issuance, if sustained, would contribute 4 percentage points to the 2018 growth rate of overall corporate debt compared with 1.3 percentage points in 2017.(3)

A record level of leveraged loans issued by UK corporates in 2017 were syndicated abroad, consistent with strong global risk appetite. While this mitigates the direct risk of loss to UK banks, it is reliant on foreign investor appetite for

(3) Based on Bank staff estimates of the stock of corporate debt; see **Chart A.5** and the corresponding footnotes.

Chart A.6 When adjusted for lower credit rating, term premia and longer duration, there is close to zero compensation for risk in sterling corporate bonds

Decomposition of sterling investment-grade corporate bond index[a]

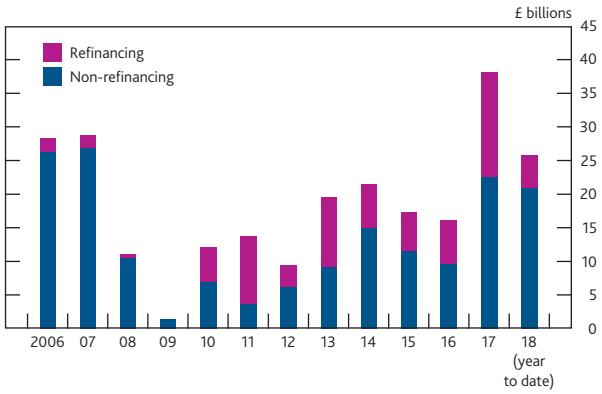


Sources: ICE/BofAML and Bank calculations.

(a) The chart shows how the yield on an index of UK investment-grade corporate bonds (in orange) splits into two components. The first component (in blue) is the risk-free interest rate, which reflects future short-term rates over a period to the (seven-year) duration of the index. The second component (in purple) is the difference between the yield and the first component, and reflects the term premium and credit spread. The adjusted credit spread accounts for changes in credit quality and duration of the index since 1998.

Chart A.7 There has been a growth in riskier forms of debt issued by UK firms

Leveraged loan issuance by UK firms[a]

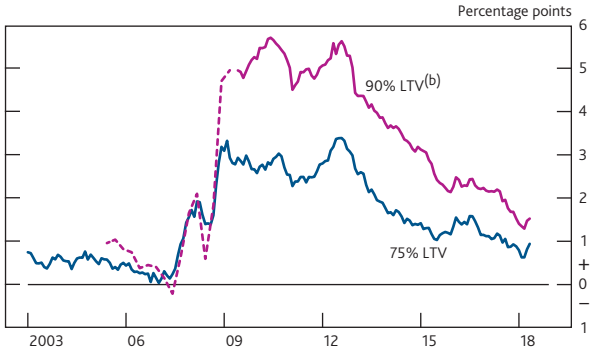


Sources: Bank of England, LCD, an offering of S&P Global Market Intelligence and Bank calculations.

(a) Based on public syndication transactions and excluding private bilateral deals.

Chart A.8 Quoted spreads on new mortgage lending have narrowed since mid-2016

Mortgage rates on new owner-occupier two-year fixed-rate mortgages relative to risk-free rates[a]



Sources: Bank of England, FCA Product Sales Database and Bank calculations.

(a) Spreads are taken relative to the risk-free rate of the same maturity.
(b) Dashed line is an estimate of historical 90% LTV spreads, which uses rates reported on new mortgages in the FCA Product Sales Database.

UK assets. And the UK is more vulnerable to a reduction in foreign investor appetite for UK assets, because the share of capital inflows vulnerable to refinancing risk has risen (see UK external financing chapter).

In contrast to developments in capital market finance, bank lending to corporates has been muted. It increased by just 2.0% in the year to April 2018, sufficient only to increase the stock of corporate debt by less than 1% over the year. This has limited the overall increase in corporate leverage and the effect on banks' resilience.

Furthermore, in recent months there has been some reduction in risk appetite in advanced economy and domestic debt markets. For example, sterling investment-grade corporate bond spreads have increased by around 30 basis points since their recent low in early 2018 and have returned to the levels last seen over a year ago. However, the adjusted compensation investors have been demanding for interest rate and credit risk has not increased to the same extent (**Chart A.6**).

The FPC continues to scrutinise this area of risk. Sustained growth of corporate credit — even if facilitated by borrowing through capital markets — could affect the resilience of the core banking system. It could do so directly, if banks become unable to distribute some of the leveraged loans in their underwriting pipeline which they originally intended to pass to investors. In addition, it could have an indirect effect on bank resilience, if highly leveraged companies amplify economic downturns by seeking to reduce their debt and thereby raising the risks banks face on all exposures (see Global debt market conditions chapter).

Mortgage lending standards had eased but the increase in lending at high loan to income ratios has been limited by the FPC's mortgage market Recommendations and lending conditions have recently shown signs of tightening.

Mortgage lending has increased by 3.4% in the year to April 2018, around a third of its average growth rate between 1997 and 2006 of 9.7%. National house price inflation has slowed to 2% in May 2018, from around 7.5% at its recent peak in 2016 Q1.

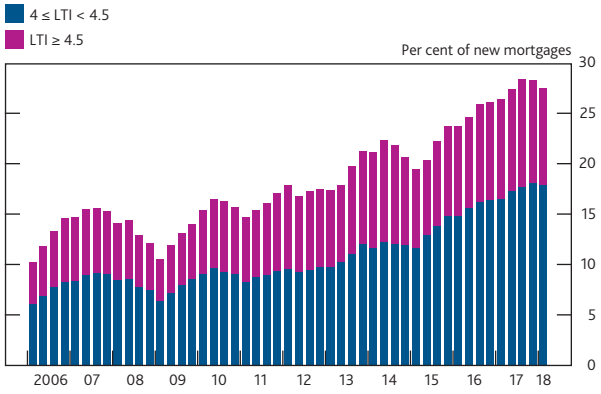
These developments are likely to have reflected headwinds to demand from the squeeze in real incomes, tax changes for additional properties,[4] and slightly lower consumer confidence.

Banks' risk appetite in mortgage lending has increased over the past few years, possibly in response to weak demand. This has helped to partly offset the effects of the headwinds to mortgage market activity. Spreads on new owner-occupier

(4) These changes include an increase in stamp duty land tax for additional properties in April 2016 and a reduction in the scope for mortgage interest tax relief in April 2017.

Chart A.9 The proportion of lending at LTI ratios between 4.0 and 4.5 has increased since 2015

Proportion of new owner-occupier mortgages extended at different LTI ratios[a][b][c]

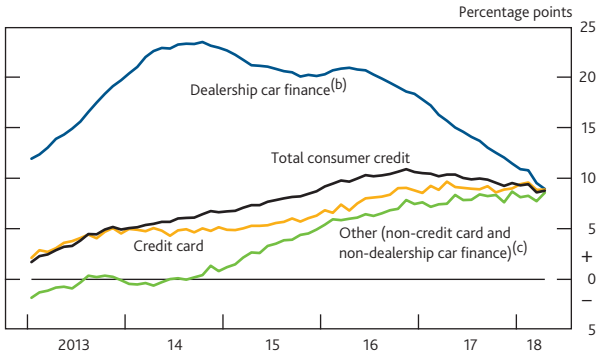


Sources: FCA Product Sales Database and Bank calculations.

(a) The Product Sales Database includes regulated mortgage contracts only. 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 amount borrowed.
(b) Includes loans to first-time buyers, and council/registered social tenants exercising their right to buy.
(c) Data include regulated mortgage contracts only, and therefore exclude other regulated home finance products such as home purchase plans and home reversions, and unregulated products such as second charge lending and buy-to-let mortgages.

Chart A.10 Consumer credit continues to grow rapidly, although it has been slowing since end-2016

Annual growth rate of consumer credit products[a]



Sources: Bank of England, ONS and Bank calculations.

(a) Sterling net lending by UK monetary financial institutions (MFIs) and other lenders to UK individuals (excluding student loans). Seasonally adjusted.
(b) Identified dealership car finance lending by UK MFIs and other lenders.
(c) Other is estimated as total consumer credit lending minus dealership car finance and credit card lending.

mortgages have fallen (**Chart A.8**) and loan to income (LTI) multiples have increased (**Chart A.9**) (see UK household indebtedness chapter).

However, the FPC's mortgage market Recommendations have insured against a marked loosening in underwriting standards and a significant increase in the number of highly indebted households. The FPC's 2014 LTI flow limit Recommendation restricts the number of mortgages extended at LTI ratios at or above 4.5 to 15% of a lender's new mortgage lending.

Although the share of owner-occupier mortgage lending at LTI multiples at or above 4 has increased materially since its recent low in early 2015, and it has been increasing over the past 18 months, the share of loans extended at LTI ratios at or above 4.5 has increased only slightly.

As the FPC has documented previously, it is at debt-servicing ratios above 40% that households are typically much more likely to experience repayment difficulties. Even at stressed levels of mortgage interest rates, of around 7%, this debt-servicing ratio arises from a mortgage LTI ratio of 4.5.

In the past few months, the trend to looser lending standards has shown some signs of reversing. With bank funding costs rising in line with those for corporates more generally, spreads between mortgage rates and risk-free rates have increased, returning to levels of late 2017 (**Chart A.8**). And the proportion of owner-occupier mortgages originated at LTI multiples above 4 fell back a little in 2018 Q1 (**Chart A.9**).

Despite a blip in March, consumer credit growth remains rapid, but the FPC and Prudential Regulation Committee have previously acted to help ensure lenders are able to absorb severe losses on consumer credit. Growth has slowed over the past year and lenders report a tightening of credit supply conditions.
Consumer credit growth remains rapid, at 8.8% in the 12 months to April 2018. It has slowed from a peak of 10.9% in November 2016 (**Chart A.10**). Growth of consumer credit slowed particularly sharply in March, before recovering equally sharply in April.

The slowdown in consumer credit growth since its peak in late 2016 has been driven by car finance, where banks do not have material exposure. Personal loan and credit card debt continues to grow rapidly.

The FPC continues to judge this credit to be an important determinant of bank losses in any downturn. Loss rates on consumer credit are far higher than for mortgages, as borrowers are much more likely to default on their consumer credit loans in the face of adverse shocks. And because the majority of consumer credit is unsecured, lenders cannot rely on the value of collateral to cushion their losses.

The FPC and Prudential Regulation Committee have previously acted to ensure lenders are able to absorb severe losses on consumer credit. Their September 2017 judgement on the appropriate loss rate for the UK consumer credit sector had been used in the 2017 stress test, and regulatory capital buffers for individual firms were subsequently set so that each bank was able absorb the effects of the scenario on its balance sheet.

There have been signs of tightening of credit supply conditions over the past year and in particular in early 2018. For example, a net percentage balance of close to 40% of lenders responding to the 2018 Q1 *Credit Conditions Survey* reported a tightening in the availability of consumer credit. And the average interest-free period on balance transfer credit cards has fallen to 26 months, compared with a peak of 30 months around a year ago.

The FPC has decided to set the UK CCyB rate at 1%.

The UK CCyB increases banks' ability to absorb losses in a stress. This enhances the ability of the banking system to continue to support the economy.(5)

The FPC intends to vary the UK CCyB rate to reflect the prevailing risk environment: when risks are high, either because banks could face bigger economic shocks or because they are more sensitive to them, a larger buffer is needed to absorb potential losses.

In its published strategy for setting the CCyB, the FPC signalled that it expects to set a UK CCyB rate in the region of 1% in a standard domestic risk environment.

Consistent with its judgement on the domestic risk environment the FPC has decided to set the UK CCyB at 1%, unchanged since November 2017. The UK CCyB rate will be 1% with binding effect one year from when it was originally set (ie 28 November 2018).

The FPC remains alert to any increase in risks faced by the UK banking system. In recent months there has been some reduction in domestic risk appetite, although it remains strong. Financing conditions in debt markets, which remain accommodative, could promote further risk-taking in the UK and elsewhere. The UK is more vulnerable to a reduction in foreign investor appetite for UK assets, as the share of capital inflows vulnerable to refinancing risk has risen. And material global risks could spill over to the UK. The FPC will conduct as normal a comprehensive assessment of the resilience of the UK banking system in the 2018 stress test and review the adequacy of the 1% CCyB rate. The results of the 2018 stress test will be published in December.

(5) The UK CCyB rate set by the FPC relates to firms' relevant UK exposures, irrespective of the country of origin of the lender. Similarly, other countries set the CCyB rates that relate to relevant exposures of UK banks overseas. The CCyB applies to all banks, building societies and investment firms (other than those exempted by the FCA) incorporated in the United Kingdom. For more details on the CCyB see 'The Financial Policy Committee's approach to setting the countercyclical capital buffer'.

Risks to the provision of financial services from Brexit

The FPC continues to assess the risks of disruption to UK financial services arising from Brexit so that preparations can be made and action taken to mitigate them. It has set out a checklist of actions that would mitigate risks of disruption to important financial services used by households and businesses to support their economic activity.

It will be difficult, ahead of March 2019, for financial companies on their own to mitigate fully the risks of disruption to households and businesses. The UK Government and European Commission have agreed an implementation period, subject to finalisation and ratification of the Withdrawal Agreement between the EU and the UK, elements of which are still in negotiation. An implementation period would reduce all of the risks set out in the FPC's checklist.

Progress has been made in the UK towards mitigating risks of disruption to the availability of financial services to UK end-users. The EU (Withdrawal) Bill has been passed by Parliament. The UK Government has committed to legislate, if necessary, to put in place temporary permissions and recognition regimes and to allow European Economic Area (EEA) entities to service contracts in the UK. Once enacted, this will allow EEA banks, insurers and non-UK CCPs to continue their activities in the UK for a time-limited period after the UK has left the EU, even if there is no implementation period, thus mitigating a number of risks of disruption to UK customers.

As yet the EU has not indicated a solution analogous to a temporary permissions regime. EEA customers remain reliant on UK-based financial companies being able to overcome any future barriers to cross-border service provision. For example, by restructuring their businesses and transferring existing contracts.

In some areas, such as derivatives contracts, actions would be needed by both UK and EU authorities to preserve the continuity of existing cross-border contracts. The FPC judges that material risks remain.

The FPC welcomes the establishment in April of a technical working group, chaired by the European Central Bank and Bank of England, on risk management in the period around 30 March 2019 in the area of financial services.

Table A.2 FPC judgement of progress against actions to mitigate the risk of disruption to end-users of financial services as at 22 June 2018

Notes: Risks are categorised as low, medium or high. The judgement reflects the underlying scale of disruption to end-users, taking account of progress made in mitigating actions. Arrows reflect developments since 12 March 2018. Blue text denotes news since 12 March 2018.

Legal frameworks

	Risk to UK	Risk to EU	
Ensure a UK legal and regulatory framework is in place	⇩		Much of the UK's legal and regulatory framework for financial services is derived from EU law. Directly applicable EU law will need to be brought into UK law. Changes will need to be made to the resulting legal framework to make it workable when the UK is no longer a member of the EU. UK regulatory authorities will also need to make changes to their own rulebooks to reflect the new legislation. The EU (Withdrawal) Bill has been passed by Parliament. HM Treasury has started publishing draft secondary legislation, and intends to lay the first financial services statutory instruments (SIs) shortly after Royal Assent. SIs establishing the temporary permissions and recognition regimes will be amongst the first laid. The Bank and the FCA expect to consult on rule changes shortly afterwards.
Implementation period to allow mitigating actions by firms	⇩	⇩	Financial institutions will need time to obtain necessary regulatory permissions and complete any necessary restructuring of their operations and re-papering of contracts. In March the UK Government and European Commission negotiated a political agreement on an implementation period and that will form part of the Withdrawal Agreement, elements of which are still in negotiation. Once finalised and ratified, this would reduce all of the risks set out in the FPC's checklist.

Preserving the continuity of outstanding cross-border contracts

	Risk to UK	Risk to EU	
Insurance contracts	■	■	Insurers in the UK and the European Economic Area (EEA) may not be able to service their existing contracts in the other jurisdiction without local authorisation. The UK Government has committed to legislate, if necessary, to allow EEA insurance companies to continue to service insurance policies held by customers in the UK (through a temporary permissions regime and additional legislation if required). Once this legislation is passed, risks to UK-based customers would be mitigated. In light of this, the PRA wrote to EEA insurers on 28 March 2018 to explain that these insurers can plan on the assumption that they will only need PRA authorisation by the end of the implementation period. EEA customers are currently reliant on their UK insurance company taking action (eg by transferring existing contracts to legal entities located and authorised in the EU).
OTC derivative contracts (uncleared)	■	■	UK and EEA parties may no longer have the necessary permissions to service uncleared over-the-counter (OTC) derivative contracts with parties in the other jurisdiction. Effective mitigation of the risk, other than through a bilateral agreement, would require legislation in both the UK and EEA to protect the servicing of existing contracts. The UK Government has committed to legislate, if necessary, to allow EEA counterparties to continue servicing contracts with UK entities (through a temporary permissions regime and additional legislation if required). EU authorities have not announced an intention to enable UK counterparties to continue servicing contracts with counterparties in the EEA.
OTC derivative contracts (cleared)	■	■	Many major UK and EEA counterparties are required by EU law to clear contracts in certain products using central counterparties (CCPs) that have been authorised or recognised by EU authorities. If clearing houses are not recognised, clearing members' ability to meet existing contractual obligations to UK CCPs will be compromised. Absent action by EU authorities the risk to the UK could be mitigated by the orderly transfer of EEA clearing members and clients out of UK CCPs.

Avoiding disruption to availability of new financial services

	Risk to UK	Risk to EU	
Clearing services			In the absence of an agreement or recognition by the European Securities and Markets Authority of UK CCPs (see above), EEA clearing members and their clients currently using UK CCPs will need to find new arrangements for future clearing services with CCPs authorised or recognised by EU authorities. The UK Government has committed to legislate, if necessary, regarding the recognition of non-UK CCPs, including a temporary recognition regime, so that these CCPs would continue to be able to provide clearing services to UK clearing members and clients in order to avoid disruption. Once this legislation is passed, risks to UK clearing members and clients would be mitigated. In light of this, the Bank wrote to non-UK CCPs on 28 March 2018 to explain these CCPs can plan on the assumption that they will only need recognition by the end of the implementation period.
Banking services			Banks will need the necessary permissions and structures in place to continue providing services to customers on a cross-border basis. Some UK-based banks are in the process of undertaking restructuring and obtaining necessary regulatory permissions for EU subsidiaries. The UK Government has committed to legislate, if necessary, for a temporary permissions regime that would enable EEA banks to continue to operate pending authorisation. Once this legislation is passed, risks to UK customers would be mitigated. In light of this, the PRA wrote to EEA banks on 28 March 2018 to explain that these banks can plan on the assumption that they will only need PRA authorisation by the end of the implementation period.
Asset management			Restrictions on cross-border portfolio delegation could require disruptive changes to asset managers' business models. To avoid this, EU national competent authorities would need to enter into co-operation agreements with the FCA. Asset managers and their funds also require authorisation to continue to market retail funds across borders. To enable funds domiciled in the EEA to continue to be marketed to investors in the UK, the UK Government has committed to legislating for a temporary permissions regime if necessary. The FCA has said that affected firms and funds do not need to submit an application for authorisation at this point.
Personal data			Financial companies' ability to carry out new and existing financial services may be impaired by barriers to the cross-border flow of personal data between the UK and EEA. This could be mitigated if the UK and EU were to recognise each other's data protection regimes as 'adequate'. The UK Government has indicated it is pursuing this via an EU-UK agreement. Companies can also take steps to mitigate this risk by, for example, introducing new clauses into contracts that permit data transfer. But this may not be comprehensive or completely effective.

Risks to the provision of financial services from Brexit

Consistent with its statutory duties, the FPC continues to identify and monitor UK financial stability risks associated with Brexit so that preparations can be made and actions taken to mitigate them. In this way, the FPC is aiming to promote an orderly adjustment to the new relationship between the UK and the EU.

There are a range of possible outcomes for the future UK-EU relationship. Given its remit, the FPC is focused on outcomes that could have most impact on financial stability. That includes outcomes in which there are barriers to providing financial services across the UK-EU.

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

In November, the FPC published a checklist of actions that would mitigate risks of disruption to important financial services used by households and businesses to support their economic activity. In March it set out its judgements of progress against this checklist and its intention to update and publish these on a quarterly basis.

Although this checklist is focused on the availability of financial services to end-users in the UK, the FPC also considers, where appropriate, risks of disruption to services available to end-users in the EU because the impact of that could spill back to the UK economy.

The checklist is not a comprehensive assessment of risks to economic activity arising from Brexit. It covers only the risks identified to date that could stem from direct disruption to financial services. There are also other risks to economic activity that could arise as a result of, for example, restrictions on exports of goods and services or a reduction in the appetite of foreign investors to provide finance to the UK. The FPC has considered these and concluded that its 2017 stress-test scenario for major UK banks encompasses a wide range of UK macroeconomic outcomes that could be associated with Brexit. As it has set out previously, the FPC judges that Brexit risks do not warrant additional capital buffers for banks.

Background to the FPC's checklist

Table A.2 summarises this checklist and the FPC's judgements of progress against actions. The checklist covers:

- ensuring the UK legal and regulatory framework is in place;
- an implementation period to allow firms to maximise their own preparations;
- actions to ensure the continuity of existing cross-border contracts; and
- actions to avoid disruption to the availability of new financial services.

The direct risks to the provision of financial services that would arise were there no agreement in place are set out below.

Legal frameworks

Ensuring the UK legal and regulatory framework is in place

Ensuring a workable UK legal and regulatory framework for financial services is in place is essential to financial stability. Much of the UK's legal and regulatory framework for financial services is derived from EU law. Directly applicable EU law will need to be brought into UK law. Changes will need to be made to the resulting legal framework to make it workable when the UK is no longer a member of the European Union.

The Government plans to achieve this with the EU (Withdrawal) Bill and related secondary legislation. Regulatory authorities will also need to make changes to their own rulebooks to reflect the new legislation.

An implementation period

Financial institutions will need time to obtain necessary regulatory permissions and complete any necessary restructuring of their operations and re-papering of contracts. An implementation period would reduce all of the risks set out in the FPC's checklist.

Actions to ensure the continuity of existing cross-border contracts

Insurance contracts

Insurers in the UK and the European Economic Area (EEA) may not be able to service their existing contracts (eg by paying claims to, or receiving premiums from, policyholders in the other jurisdiction) without local authorisation. This could affect around £27 billion of insurance liabilities and 10 million UK policyholders. Around £55 billion of insurance liabilities and 38 million EEA policyholders could also be affected.

Uncleared over-the-counter derivatives contracts

UK and EEA parties may no longer have the necessary permissions to service certain uncleared over-the-counter (OTC) derivative contracts with parties in the other jurisdiction. Amending existing contracts and/or undertaking other 'lifecycle events' could constitute regulated activities in some EEA member states and in the UK. Such lifecycle events include: rolling open positions, exercising options and trade compression. Lifecycle events are common in servicing derivative contracts. Some — such as trade compression — may be required by regulators. Based on latest data, this could affect around a quarter of contracts entered into by parties in both the UK and EEA, with a notional value of around

£29 trillion, of which around £16 trillion matures after March 2019.

Cleared over-the-counter derivatives contracts
As set out above, UK and EEA parties may no longer have the necessary permissions to service certain cleared OTC derivative contracts with parties in the other jurisdiction.

In addition, many major UK and EEA counterparties are required by EU law to clear contracts in certain products using central counterparties (CCPs) that are authorised or recognised under EU legislation. In the absence of an agreement, UK CCPs would be able to serve EEA customers after exit only if they are 'recognised' by the European Securities and Markets Authority (ESMA). EEA clearing members and their clients currently rely heavily on CCPs based in the UK. The ECB estimates that UK CCPs clear approximately 90% of euro-denominated interest rate swaps used by euro-area customers.

The notional amount of outstanding cleared OTC derivative contracts that could be affected is around £67 trillion (around £38 trillion of which matures after 2019 Q1).

Actions to avoid disruption to the availability of new financial services

Clearing services
As noted above, in the absence of an agreement, UK CCPs would be able to serve EEA customers after exit only if they are 'recognised' by ESMA. This could disrupt availability of services to EEA end-users.

Additionally, the European Commission has made a legislative proposal containing draft provisions on new requirements for the recognition of non-EU CCPs, including a 'location policy', which could be used to prohibit EEA banks from accessing some CCPs outside the EEA, even in 'equivalent' jurisdictions.

EEA, and rest of world, CCPs will need recognition from UK authorities in order to serve UK customers.

Banking services
Banks will need the necessary permissions and structures in place to continue providing services to customers on a cross-border basis.

EEA businesses rely on UK-based banks for certain services. UK-incorporated banks provide around half of wholesale banking services used by EEA customers. Disruption to this would create risks to the availability of services to end-users in the EEA.

There are also 76 branches of EEA banks operating in the UK under the current 'passporting' regime.

Asset management
Delegation of fund management across borders is a global practice. It is estimated that the management of around 10% — or £1 trillion — of funds domiciled in non-UK EEA countries is undertaken in the UK. The management of at least an additional estimated 20% of funds domiciled in these countries is delegated to countries outside the EEA and the UK. Restrictions on this delegation could require disruptive changes to asset managers' business models.

Both EU and UK investors invest in funds domiciled in the EEA. Asset managers and their funds require authorisation to market retail funds across borders.

Personal data
Even with the necessary regulatory permissions, the ability of financial companies to carry out both new and existing financial services may be impaired by barriers to the cross-border flow of personal data between the UK and EEA. These barriers could disrupt firms' ability to service EEA clients from their data centres, which are typically located in the UK.

Global debt market conditions

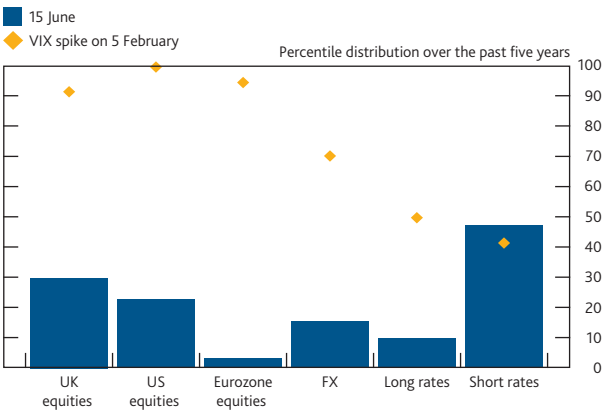
Financing conditions in advanced-economy debt markets have tightened in recent months, returning corporate bond risk premia to levels last seen over a year ago. Nevertheless, relative to historical trends, financial conditions for corporates with access to capital markets remain accommodative. Risky asset prices continue to offer little compensation for interest rate or credit risk.

Where borrowers have taken advantage of market conditions to raise their debt levels, an adjustment in market prices could expose a debt overhang, giving rise to risks to financial stability.

Market conditions have encouraged an increase in leverage over recent years, by corporates in the US and in some emerging markets. UK corporate leverage remains materially below its 2008 level, despite rapid lending growth to riskier companies by non-banks, in part because bank lending to corporates has been muted. The Bank's 2017 stress test showed major UK banks are resilient to a sharp adjustment in corporate credit markets.

Chart A.11 Volatility remains low in a broad range of markets

Cross-asset volatilities relative to their distribution over the past five years[(a)]



Sources: Barclays, Bloomberg Finance L.P. and Bank calculations.

(a) All are one-month implied volatilities; FX is calculated using an average for three currency pairs: GBP/USD, EUR/USD and USD/JPY; equities is calculated using an average for the major developed market indices: FTSE 100, Euro Stoxx 50 and S&P 500; short and long rates are calculated as the average of euro, sterling and US dollar swaption implied volatilities on one and ten-year tenors respectively.

Corporate financing conditions in advanced economies have tightened in recent months but remain accommodative.

Advanced-economy short-term interest rates have risen since November, but remain low by historical standards. The Federal Open Market Committee has raised the target range for the federal funds rate by 0.75 percentage points since the November *Report*. And the European Central Bank announced plans in June to taper quantitative easing purchases to €15 billion per month from October 2018 and bring purchases to an end by December 2018.

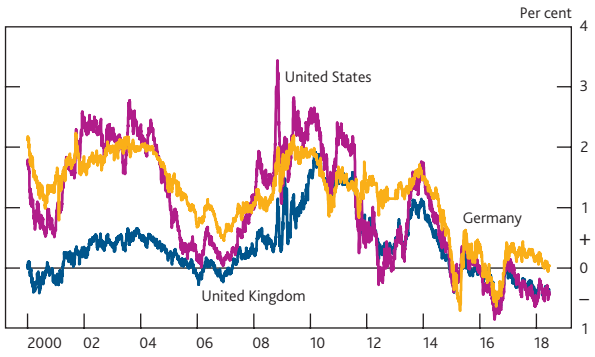
Consistent with this, volatility in short-term interest rates has also increased (**Chart A.11**). In contrast, volatility in long-term interest rates remains low by historical standards following its spike in early February. Longer-term interest rates have risen slightly, but are also close to historical lows, with estimated term premia — the compensation for holding longer-maturity assets — remaining compressed (**Chart A.12**).

In emerging market economies, strong global investor appetite for riskier debt over recent years has been accompanied by a rise in sovereign and corporate debt.

The extended period of very low interest rates in advanced economies has encouraged investors to acquire higher-yielding but riskier assets. This has contributed to a generally favourable borrowing environment for many emerging market economies (EMEs) and has been accompanied by a rise in both sovereign and corporate EME debt.

Chart A.12 Term premia in government bond markets are low

Estimates of term premia in 10-year nominal government bond yields(a)(b)

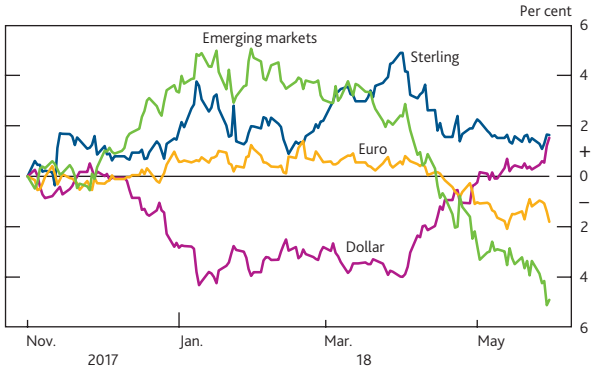


Sources: Bloomberg Finance L.P., Federal Reserve Bank of New York and Bank calculations.

(a) UK and German estimates are derived using the model described in Malik, S and Meldrum, A (2016), 'Evaluating the robustness of UK term structure decompositions using linear regression methods', *Journal of Banking & Finance*, Vol. 67, June, pages 85–102. US estimates are available from www.newyorkfed.org/research/data_indicators/term_premia.html.
(b) Estimates for the United Kingdom are calculated using data since October 1992. Estimates for Germany are calculated using data since January 1999.

Chart A.13 The US dollar has appreciated since April, while EME exchange rates depreciated over the same period

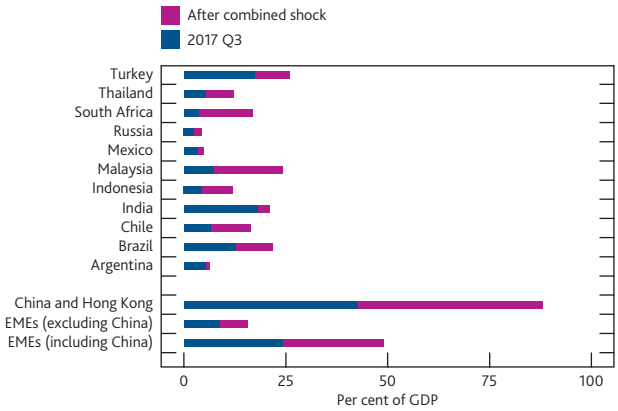
Cumulative change in exchange rate indices since November



Source: Bloomberg Finance L.P., ECB and Bank calculations.

Chart A.14 'Debt at risk' is low in EMEs

Non-financial corporate sector debt with low interest coverage ratios(a)



Source: Board of Governors of the Federal Reserve System, *How vulnerable are EME corporates?*

(a) Debt is defined as 'at risk' if the borrower's interest coverage ratio is less than two. 'After shock' mechanically adjusts the 2017 Q3 figures for a 20% fall in earnings, a 100 basis points increase in the effective interest rate and a 20% fall in the domestic exchange rate.

More recently, rising bond yields and a stronger US dollar have tightened financial conditions in many EMEs.

Rising US bond yields and the renewed strength in the US dollar since April (**Chart A.13**) have tightened the financial conditions facing many EMEs in 2018. Since April, portfolio capital has flowed out of EMEs, spreads on EME sovereign and corporate bonds have widened and many EME exchange rates have depreciated against the US dollar (**Chart A.13**).

Market pressure initially focused on Argentina and Turkey, where external vulnerabilities were most visible. Argentina applied for financial support from the IMF in May, while the central bank of Turkey raised its key interest rate by a cumulative 500 basis points in 2018 Q2 in order to support the Turkish lira. But exchange rates in Brazil, South Africa and Mexico have also fallen sharply, while central banks in India and Indonesia have raised policy rates (by 25 and 50 basis points, respectively) following pressure on their exchange rates.

Although external imbalances in many EMEs have fallen, dollar-denominated debt remains a concern…

Many EMEs have built up external debt relative to GDP in the past few years, although generally to levels below their earlier peaks. Smaller current account imbalances and flexible exchange rates mean that most emerging economies are less vulnerable to an external financing crisis than they were in the run-up to the decade of emerging market driven crises seen in the late 1990s and early 2000s. In addition, many EMEs have established local currency bond markets in recent years, reducing their dependence on dollar borrowing. A study by the US Federal Reserve Board suggests that riskier corporate debt (where the earnings of the borrower are in danger of being insufficient to pay the interest on the debt)(1) is a relatively low share of GDP in most EMEs outside China and would rise only moderately after an economic shock (**Chart A.14**).(2)

However, some EMEs have high levels of government or corporate debt denominated in US dollars (**Chart A.15**). In such cases, unless borrowers have revenues in US dollars or have hedged themselves against exchange rate changes, falls in domestic exchange rates relative to the US dollar can cause the costs of servicing their dollar-denominated debt to rise sharply.

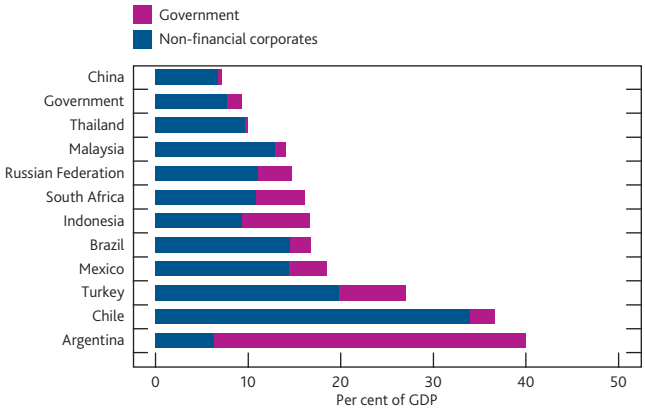
…while the increased role of investment funds could lead to a broader group of EMEs being affected.

The increased role of investment funds in EME financial markets may also make EME capital flows more sensitive to changes in global financial conditions. Decisions by end-investors to withdraw their investments may amplify

(1) Corporate debt is here taken to be at risk where the borrower's earnings before interest, tax, depreciation and amortisation (EBITDA) are less than twice the level of interest payments.
(2) Board of Governors of the Federal Reserve System, *How vulnerable are EME corporates?*

Chart A.15 Some EMEs still have high levels of US dollar-denominated debt

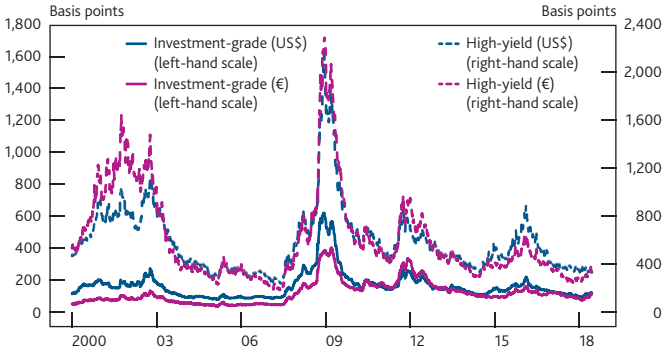
US dollar-denominated debt by sector in selected EMEs, 2017 Q4



Source: Institute of International Finance.

Chart A.16 Corporate bond spreads remain compressed

Euro and US dollar corporate bond spreads(a)

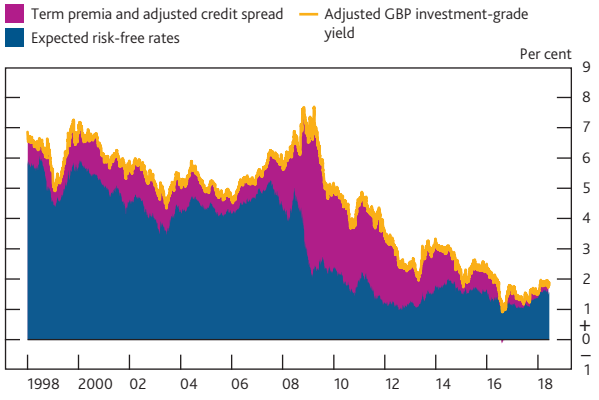


Sources: ICE/BofAML and Bank calculations.

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

Chart A.17 When adjusted for lower credit rating, term premia and longer duration, there is close to zero compensation for risk in sterling corporate bonds

Decomposition of sterling investment-grade corporate bond index(a)



Sources: ICE/BofAML and Bank calculations.

(a) The chart shows how the yield on an index of UK investment-grade corporate bonds (in orange) splits into two components. The first component (in blue) is the risk-free interest rate, which reflects future short-term rates over a period to the (seven-year) duration of the index. The second component (in purple) is the difference between the yield and the first component, and reflects the term premium and credit spread. The adjusted credit spread accounts for changes in credit quality and duration of the index since 1998.

price changes and spread them to other markets (see Market-based finance resilience chapter).

Such market-based contagion channels could interact with a further deterioration in the external environment facing EMEs — for example, from a further rise in the US dollar, a further intensification in trade tensions or a sharp slowdown in China — to force a wider group of EMEs to tighten policy more significantly, leading to a broader slowdown in EME growth. As non-China EMEs contributed over 45% of global growth between 2010 and 2017, a broad-based slowdown would have a range of direct and indirect impacts on UK banks and investors.

Risky asset prices in advanced-economy capital markets continue to offer little compensation for interest rate or credit risk.

Equity risk premia — the additional return that investors require for holding equities instead of less risky government debt — for euro-area and US equities are at historically low levels, little changed from the time of the November *Report*.

The principal risks are in debt markets. Spreads remain at levels comparable with those seen before the financial crisis, with high-yield more compressed compared to historical levels than investment-grade spreads (**Chart A.16**).

The reduction in the compensation investors receive for bearing risk in corporate bond markets over recent years has occurred despite a fall in credit quality. Average credit ratings, particularly for sterling and euro bonds, have declined over the past two decades and the duration of outstanding bonds has increased. When this is taken into account, the joint compensation investors are demanding for interest rate and credit risk adjusted for changes in the credit ratings and duration is close to zero (**Chart A.17**). In addition, UK corporate credit default swap (CDS) prices have fallen over the past two years, while corresponding default probabilities calculated by banks have barely changed over the same period.(3) This implies that investors are willing to take the same risk for less compensation (**Chart A.18**).

Corporate bond markets in particular remain vulnerable to a repricing, which could be amplified by redemptions from open-ended bond funds.

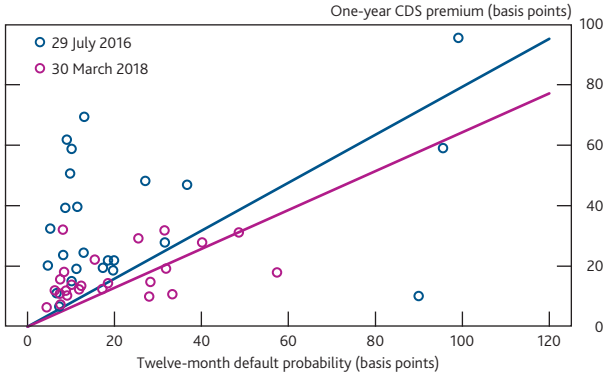
Asset valuations in debt markets appear predicated on a continuation of the recent experience of moderate growth and subdued inflation. A reappraisal of risks could lead to an increase in the compensation required by investors to hold these risky assets instead of less risky government bonds.

Although a sharp fall in asset prices is not, itself, a risk to financial stability, it can adversely impact the real economy

(3) Based on a sample of 24 of the most traded UK CDS. The default probabilities are aggregates of one-year ahead estimates constructed by financial institutions following an internal ratings-based approach to regulation.

Chart A.18 The cost of UK corporate default protection (CDS premium) has fallen relative to default probabilities

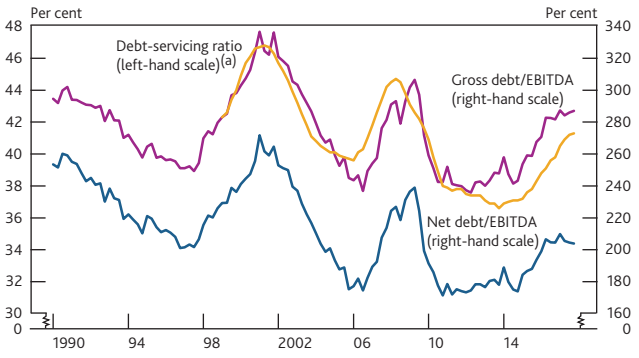
The twelve-month default probability for UK issuers against the one-year CDS premium



Sources: Credit Benchmark, Markit and Bank calculations.

Chart A.19 US corporate leverage and the debt-servicing ratio have been rising since 2014

US corporate leverage and debt-servicing ratio

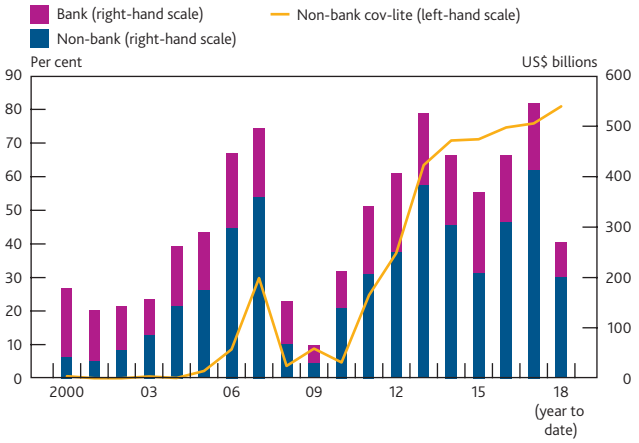


Sources: BIS debt service ratios statistics, Federal Reserve Board Flow of Funds, US Bureau of Economic Analysis and Bank calculations.

(a) Debt-servicing ratio as calculated by BIS, defined as the ratio of interest payments plus amortisations to income.

Chart A.20 Issuance of US leveraged loans on weak terms has accelerated, driven by non-banks

Gross issuance of US leveraged loans and the share of this issuance with weak covenants(a)(b)(c)



Sources: Bank of England, LCD, an offering of S&P Global Market Intelligence and Bank calculations.

(a) Based on public syndication transactions, and excluding private bilateral deals.
(b) 'Non-bank' refers to loans classified as institutional by S&P LCD. These are typically syndicated to institutional investors, including CLOs, although some banks buy institutional term loans. 'Bank' refers to loans classified as pro-rata by S&P LCD. These are typically syndicated to banks and finance companies.
(c) A cov-lite loan has bond-like incurrence covenants, rather than maintenance tests which loans traditionally have featured.

through several channels. An adjustment of market prices may lead to losses in the trading books of banks, which could force them to cut back their lending to the wider economy. And if corporates take advantage of accommodative financing conditions to raise their debt levels, then in a downturn these firms may be forced to default or to deleverage by cutting investment and employment, affecting broader economic activity.(4)(5) This could increase the risk of losses to lenders on all forms of lending.

The effects of sharp adjustments in debt markets can also be amplified by fragile liquidity, particularly if some investors behave procyclically — that is, if they sell risky assets in large quantities purely in response to a deterioration in the performance of their portfolios (see Market-based finance resilience chapter).

In the United States, accommodative financial conditions over recent years have encouraged the corporate sector to increase leverage…

The compression in corporate bond spreads has been accompanied by increased corporate financial leverage in the United States over the past few years.(6) It has increased from 254% of earnings in 2015 Q1 to 290% of earnings in 2018 Q1 (**Chart A.19**), and is now similar to pre-crisis levels. Higher corporate debt has also led to a rise in the debt-servicing ratio in recent years but it remains below its pre-crisis average (**Chart A.19**).

…while underwriting standards in the United States have weakened.

The increase in US corporate leverage has been accompanied by a growth in riskier borrowing and weaker underwriting standards.

Lending to riskier firms, such as non-investment grade companies, increased sharply in 2017. As a result, issuance of high-yield bonds, leveraged loans and collateralised loan obligations (CLOs) were all significantly higher than a year earlier. In 2017, gross issuance of leveraged loans (loans to corporates that are typically highly indebted, have a non-investment grade rating, or are owned by a private equity sponsor) rose to above their 2007 peak; a pattern sustained in the first half of 2018 (**Chart A.20**).

At the same time, underwriting standards, particularly for leveraged lending, have deteriorated. In the United States, the

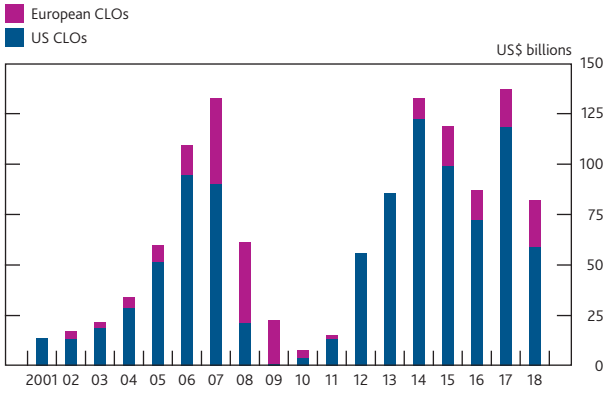
(4) Rapid growth of overall corporate credit, particularly towards riskier firms, can create a 'debt overhang' and could add to medium-term risks to economic growth. See International Monetary Fund (2018), *Global Financial Stability Report*, April.
(5) If the level of corporate debt becomes difficult to service, either because interest rates rise or because corporate earnings come under pressure, some highly leveraged firms may default on their debts, and others may be forced to cut investment, exacerbating the initial downturn. See Kalemli-Ozcan, S, Laeven, L and Moreno, D (2018), 'Debt overhang, rollover risk, and corporate investment: evidence from the European crisis', *NBER Working Paper No. 24555*, April.
(6) Corporate leverage is defined here as the percentage of gross debt to EBITDA — earnings before interest, tax, depreciation and amortisation.

share of leveraged lending deals with weaker covenants — where investors accept fewer safeguards in the event of a deterioration in the debtor company's finances — has increased to over 80% in 2018, from less than 5% in 2010 (**Chart A.20**). The increase in issuance has been largely driven by non-banks.

A large share of leveraged loans are packaged into securities sold as CLOs. Global investor demand for CLOs has helped fuel demand for underlying leveraged loans (**Chart A.21**). CLOs now own roughly half of the total outstanding leveraged loans in the US.(7) In the past, securitisation structures, such as CLOs, were complex and opaque, and investors were unable to properly assess their risks. A number of regulatory initiatives were implemented in response (see the November *Report*). For example, US and European regulators implemented risk retention rules to ensure that the originator, sponsor or original lender has retained an interest in the securitisation of at least 5%. However a court ruling has since exempted managers of open-market US CLOs from risk retention rules.

Chart A.21 Investor demand for CLOs has helped fuel demand for underlying leveraged loans

US and European net issuance of CLOs



Source: JPMorgan.

The 2017 stress test showed banks are resilient to an adjustment in US corporate credit markets.

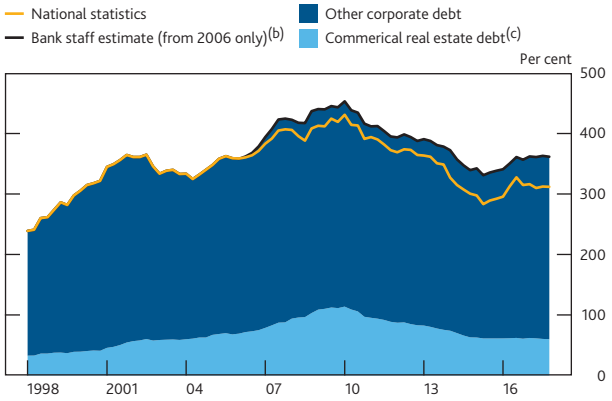
UK banks' exposures to the United States account for around 293% of CET1, including claims of around 18% of CET1 on US banks. The 2017 stress-test scenario was more severe than the global financial crisis. For the United States, GDP fell by 3.5% during the first year of the stress and high-yield US corporate bond spreads increased from around 465 basis points in 2016 Q4 to around 1,615 basis points in 2017 Q4. As a result, the corporate impairment rate (excluding CRE) was projected to be 7.8% over the five-year stress. US companies involved in the oil and gas extraction industry were among those most severely affected. No bank needed to strengthen its capital position as a result of the stress test, which will be repeated in 2018.

In contrast, UK corporate leverage has not reached unusually high levels.

UK corporate leverage remains below its 2008 level (**Chart A.22**). This is also the case when adjusted by Bank staff to produce an indicative estimate of total private non-financial corporations' (PNFCs') debt that accounts for increasingly used market-based sources of finance.(8) Much of the pre-crisis increase and post-crisis reduction in corporate leverage was driven by the commercial real estate sector (**Chart A.22**). Excluding commercial real estate, corporate leverage is around its average level over the past 15 years.

Chart A.22 UK corporate leverage remains materially below its 2008 level but has begun to rise

Bank staff estimate of UK PNFC gross debt to earnings(a)



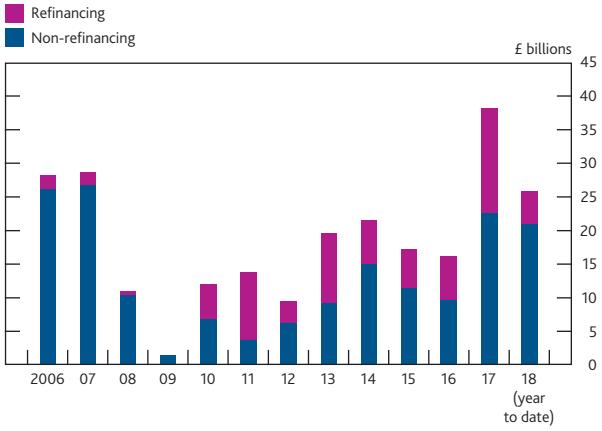
Sources: Association of British Insurers, Bank of England, Cass Commercial Real Estate Lending survey, Deloitte, LCD (an offering of S&P Global Market Intelligence), London Stock Exchange, ONS, Preqin, Thomson Reuters Deals Business Intelligence and Bank calculations.

(a) 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. Gross operating surplus is adjusted for FISIM.
(b) The black line is a Bank staff estimate of corporate debt including additional sources of market-based finance, not fully captured in National Statistics. Both the Bank and ONS are working to improve these estimates in future. Additional sources of debt include bonds listed outside of the London Stock Exchange, private placements, syndicated loans not held by banks and loans originated by private debt funds. In constructing this estimate, the definition of UK residency may not be fully consistent with National Accounts. Debt securities are valued at nominal value. Debt securities and syndicated loans issued in foreign currency are assumed to be hedged and so are not affected by currency valuation effects. Given these caveats, the Bank staff estimate is not fully comparable with National Statistics.
(c) The commercial real estate debt series shows estimated debt of issuers undertaking real estate activities or development of buildings. For some forms of debt, this issuer description information is not available (i) at sufficient granularity or for (ii) parts of the date range shown in the chart. In these instances, the best available proxy for the proportion of debt which is related to commercial real estate is used.

(7) See International Monetary Fund (2018), *Global Financial Stability Report*, April.
(8) The ONS has been working closely with Bank staff — and will continue doing so in the future — to improve estimates of PNFC debt in future National Accounts as part of the ONS's Enhanced Financial Accounts initiative.

Chart A.23 There has been a growth in riskier forms of debt issued by UK firms

Leveraged loan issuance by UK firms[a]

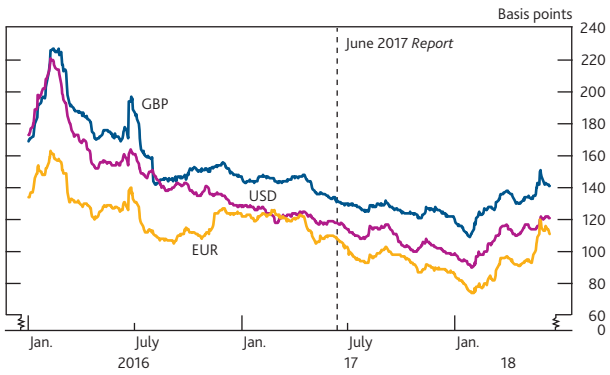


Sources: Bank of England, LCD, an offering of S&P Global Market Intelligence and Bank calculations.

(a) Based on public syndication transactions and excluding private bilateral deals.

Chart A.24 Corporate bond spreads have increased over the past few months to levels last seen over a year ago

Investment-grade corporate bond spreads[a]



Sources: ICE/BofAML and Bank calculations.

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

Robust growth of finance from capital markets has been accompanied by muted growth of bank lending.

Aggregate UK corporate debt grew at an annual rate of 6.2% in 2017 Q4, a little above its historical average. Accommodative financial conditions in advanced-economy markets have supported growth in non-bank finance of UK corporates over the past few years, and a shift away from borrowing from banks. For example, since 2007, nearly three quarters of net finance raised publicly by UK PNFCs in the UK has been through the issuance of tradable securities, and most of this through corporate bond issuance (see Market-based finance resilience chapter).

Riskier forms of debt such as high-yield bonds and leveraged loans have been growing more rapidly, with gross issuance of leveraged loans by non-financial firms reaching a record level of £38 billion in 2017 (**Chart A.23**). In early 2018, this riskier type of issuance has been even stronger, reaching around £26 billion in the year to June, and a greater proportion of it has been used for increasing leverage. This recent growth in leveraged loan issuance, if sustained, would contribute 4 percentage points to the 2018 growth rate of overall corporate debt compared with 1.3 percentage points in 2017.[9] So the FPC continues to monitor these developments closely.

As in the US, an increasing proportion of this issuance has been accompanied by a weakening in underwriting standards. In the UK, leveraged loans with weaker covenants accounted for 77% of total gross issuance in 2017, compared with 38% in 2016.

Bank lending to corporates has remained muted, with an annual growth rate of 2.0% in April 2018 — sufficient only to increase the stock of corporate debt by 1% over the year. In addition, the Bank's Agents report that credit supply for smaller firms has tightened over the year to May 2018, particularly for construction, development and consumer-facing sectors.

Because the pickup in corporate debt has been driven by market-based finance, and corporate leverage has not reached unusually high levels, the FPC judges the implications of developments to date for credit losses across the UK banking system in periods of stress to be limited.

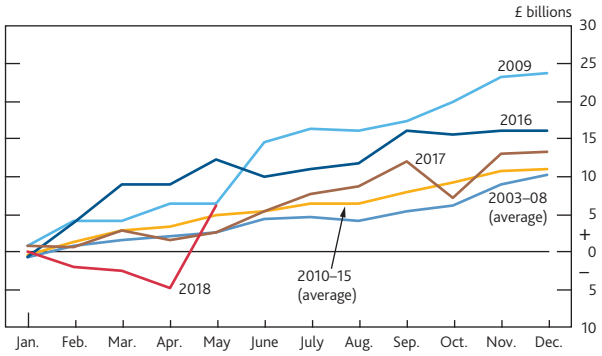
There are recent signs of market financing conditions tightening.

Investment-grade corporate bond spreads in sterling, euro and US dollar have all increased by around 30 basis points since their recent low in early 2018 and are now at levels last seen over a year ago (**Chart A.24**). This could signal some reversal of increased risk-taking in this area. Net issuance of corporate bonds in 2018 had been much weaker than in previous years in

(9) Based on Bank staff estimates of the stock of corporate debt; see **Chart A.22** and the corresponding footnotes.

Chart A.25 Net issuance of corporate bonds had been weak in the first few months of 2018 but has rebounded in May

Net cumulative bond issuance by UK PNFCs, all currencies



Sources: Bank of England and Bank calculations.

the first few months of 2018, though has rebounded in May (**Chart A.25**).

The FPC will continue to scrutinise this area of risk. Financing conditions in markets remain accommodative overall, despite the recent tightening. And sustained rapid credit growth — even if facilitated by market-based finance — could still affect the resilience of the core UK banking system.

The Bank's 2017 stress test showed that major UK banks are resilient to a sharp adjustment in corporate credit markets.

The Bank's 2017 stress test incorporated sharp movements in global and domestic market prices and indices, including interest rates, term premia, corporate bond spreads, exchange rates, volatility measures, credit spreads and equity indices, with many of these shocks resembling the market movements observed during the financial crisis. For example, the VIX index averaged 38 compared to a quarterly average of around 40 during the financial crisis.

Global output contracted by 2.4% over the first year of the stress scenario as economies around the world experience synchronised slowdowns, and growth in China and Hong Kong was particularly adversely affected. For Hong Kong and China, the cumulative corporate impairment rate (excluding CRE) was projected to be 7.8% over the five-year stress.

For the UK, the stress test included a fall in UK corporate profits of almost 7% and a 40% fall in UK CRE prices. Major UK banks' aggregate non-CRE domestic corporate exposures were just over £250 billion (102% CET1) in total at the start of the test and banks were projected to incur impairments of around £22 billion over the five years of the stress, equating to an impairment rate of 9.0%. Over the five years of the stress, UK CRE impairments total £3.8 billion on just over £60 billion (25% CET1) of starting exposures. This equates to a five-year impairment rate of 6.9%.

No bank needed to strengthen its capital position as a result of the stress test. The major UK banks will be tested again against this scenario in 2018.

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

Other global vulnerabilities

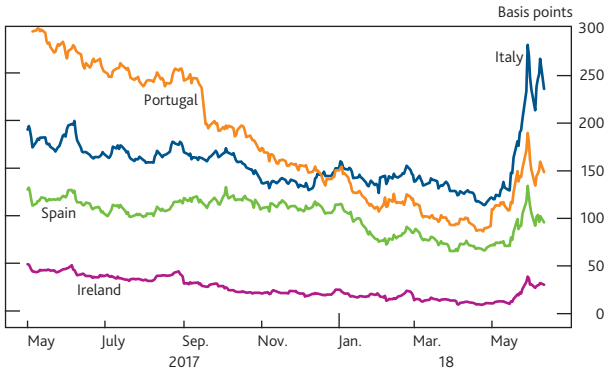
In addition to risks stemming from global debt markets, the FPC judges that other risks to UK financial stability from the global economy remain material and have increased. Political uncertainty led to sharp falls in Italian asset prices in late May. Asset prices have since partly recovered but the episode suggests rising risks in the euro area and underlines the vulnerabilities created by high public debt levels and interlinkages between banks and sovereigns in a currency union. Although direct UK banking exposures to Italy are low, if financial strains were to spread across the euro area, these would pose a material risk to UK financial stability.

Debt levels in China remain elevated. Although the Chinese authorities have taken action to improve financial regulation and are pursuing some other policies aimed at reducing corporate leverage, this has so far led to only a small fall in private non-financial sector debt as a share of GDP. Trade tensions have intensified.

In the 2017 stress test major UK banks proved resilient to a severe recession in China, the euro area and the global economy more broadly.

Chart A.26 Government bond spreads rose sharply in Italy in late May

Spreads between yields on government bonds of selected euro-area countries and German bunds[a]



Sources: Thomson Reuters Datastream and Bank calculations.

(a) Last data point is 15 June 2018.

Global risks to UK financial stability remain material.

In addition to the risks discussed in the Global debt market conditions chapter, the FPC judges that other global risks to UK financial stability remain material and have increased. These risks can affect UK financial stability: directly through UK banks' exposures to vulnerable economies; indirectly by financial contagion through UK banks' exposures to other affected banks; and through macroeconomic spillovers to the UK economy, testing banks' resilience to UK economic downturns.

Political uncertainty in Italy led to sharp falls in Italian asset prices in late May.

Concerns about a potential political crisis in Italy provoked a sharp reaction in financial markets in late May. Italian government bond spreads to German bunds — an indicator of the perceived riskiness of Italian government bonds relative to German bunds — increased sharply, the share prices of Italian banks fell, and the cost of insuring against default on the debt of Italian banks (as measured by credit default swaps) rose sharply. Bond spreads in Spain and Portugal also rose (**Chart A.26**) on concerns that events in Italy would lead to a renewal of the tensions that had affected the euro area in 2010–12.

Italian bond spreads to bunds peaked at over 280 basis points on 29 May. This was their highest level since July 2013 but was well below the 500 basis points that they reached in July 2012

and contagion to other euro-area markets was significantly more limited.

Although some of the rise in bond spreads was reversed after the Italian government was formed, Italian bond yields remain elevated.

The episode highlighted long-standing vulnerabilities in Italy.
Although Italy runs a current account surplus (2.8% of GDP in 2017) and the government budget excluding interest payments is also in surplus (1.5% of GDP in 2017), it has a high level of government debt (132% of GDP at the end of 2017, the second highest in the euro area behind Greece).

This reflects previous high budget deficits and weak economic growth over the past 20 years. Real GDP in Italy in 2018 Q1 was only 9% higher than in 1998 Q1, while in the euro area as a whole it rose by a third over the same period.

The resulting high financing needs leave Italian public finances particularly vulnerable to political uncertainty or to a deterioration in market conditions. Around €740 billion of public debt (43% of GDP) is due to mature before the end of 2020.

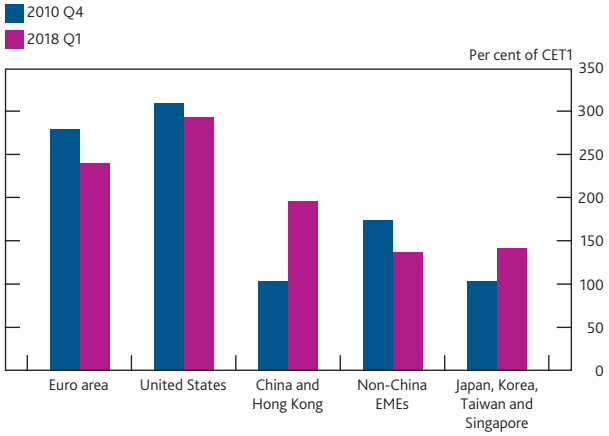
Around a quarter of outstanding Italian public debt is held by Italian banks. Stress in the Italian public debt market could therefore lead to renewed strains on the Italian banking system, particularly as the level of non-performing loans (14.4% of total Italian banks' gross loans), though falling, remains high. As banks in Italy provide 80% of total credit to non-financial corporations in Italy, losses on the bank's holdings of government debt could have a material impact on the supply of credit to the real economy, leading to slower economic growth and further credit losses for the banks. The common equity Tier 1 (CET1) capital of significant Italian banks stood at 13.3% of their risk-weighted assets at the end of 2017.

Direct UK banking exposures to Italy are low. If renewed financial strains were to spread across the euro area, this would pose risks to UK financial stability.
The UK banking system has limited direct exposure to Italy (representing 10% of CET1 in 2018 Q1), Spain or Portugal (7% and 1% of CET1, respectively).

However, the episode suggests rising risks in the euro area and underlines the vulnerabilities created by high public debt levels and interlinkages between banks and sovereigns in a currency union. If serious strains were to emerge within the euro area, UK financial stability could be affected through a wide range of other channels. In particular, UK-owned banks have much higher claims on the euro area as a whole (**Chart A.27**), especially France (69% of CET1), Germany (64% of CET1) and the Netherlands (36% of CET1), which themselves have close

Chart A.27 UK banks have large exposures to the euro area, the US and China

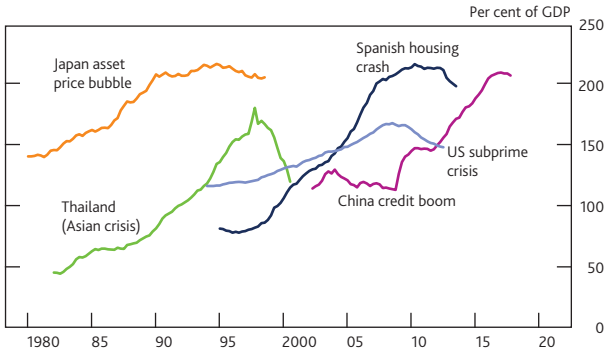
UK banks' claims on selected countries and regions



Sources: Bank of England, SNL Financial and Bank calculations.

Chart A.28 Countries that underwent sharp credit booms have often experienced a crisis

Private non-financial sector debt[a]

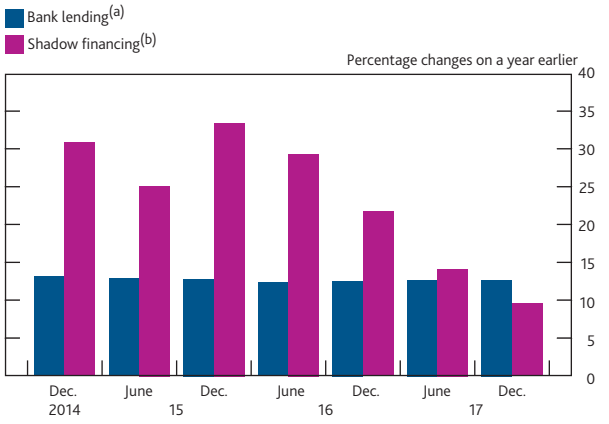


Sources: BIS total credit statistics and Bank calculations.

(a) Includes lending to households and non-financial corporations by all sectors at market value as a percentage of GDP, adjusted for breaks.

Chart A.29 Growth in shadow financing activities in China has slowed

Growth of conventional bank loans and shadow financing

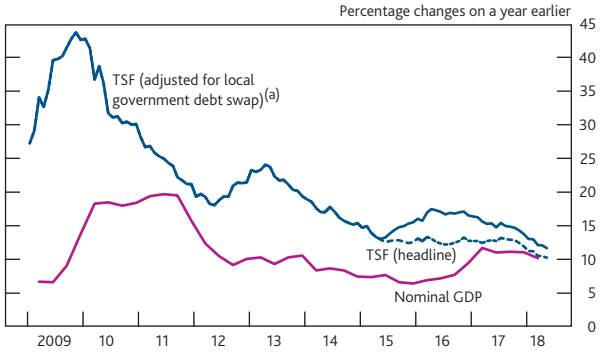


Sources: CEIC and Bank calculations.

(a) Bank lending includes: local and foreign currency loans.
(b) Shadow credit includes: trust and entrusted loans, P2P lending, and Wealth Management Product investments in bond market funds and Trusts investments into bonds.

Chart A.30 Lending growth in China has slowed

Growth of total social financing (TSF) and nominal GDP



Sources: CEIC and Bank calculations.

(a) Adjusted TSF allows for the statistical effect of replacing local government borrowing via financing vehicles with the issuance of municipal bonds.

trading links with Italy and strong financial links with the Italian banking system.

Financial vulnerabilities in China remain elevated.

Economic growth in China over the past few years has been supported by large increases in borrowing. Private non-financial sector debt as a share of GDP has risen by over 40 percentage points over the past five years. Such rapid rises in credit have preceded financial crises in several other countries (**Chart A.28**).

The authorities have taken action to improve financial sector regulation and credit growth has slowed…

Financial conditions in China have tightened but, in contrast to Hong Kong (see below) and other emerging market economies (EMEs) (see Global debt market conditions chapter), this largely reflects domestic factors rather than rising US bond yields or the stronger US dollar. Over the past 18 months, the Chinese authorities have taken a series of measures to restrain the growth of shadow financing, which had previously been growing rapidly (**Chart A.29**), and to reduce corporate leverage.

In March 2018, they announced reforms to the framework of financial regulation, including the merger of the banking and insurance regulators and greater powers for the People's Bank of China to set regulatory rules. These are intended to increase the effectiveness of regulatory oversight and to improve the co-ordination of prudential policy.

Credit growth has continued to slow. Annual growth in total social financing (TSF), a broad measure of domestic financing that includes some shadow financing, slowed to 11.7% in May 2018, down from 15.4% in May 2017 (**Chart A.30**).(1)

…but there is a risk that efforts to reduce credit growth may not be sustained if growth were to slow.

So far, the slowdown in the growth of domestic financing has led to only a slight fall in private non-financial sector debt as a share of GDP. And there may still be a risk that the authorities boost domestic lending again to support growth. Indeed, the Chinese authorities have already created additional room for the banks to expand credit by cutting the reserve requirement ratio — the reserves that Chinese banks are required to keep with the central bank — by 1 percentage point in April 2018 and announcing that a further half percentage point cut would take effect in early July.

Rising US interest rates have tightened financial conditions in Hong Kong but the banking system appears resilient.

The Hong Kong Monetary Authority (HKMA) operates a currency board fixing the exchange rate of the Hong Kong dollar against the US dollar. As a result, financial conditions in

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

Hong Kong are directly affected by changes in US monetary policy. The steady increase in US policy rates has led to tighter financial conditions in Hong Kong, raising concerns about the possible impact on Hong Kong's property market and, through this, on its banks. However, the banking system appears well placed to absorb shocks from the property market: the average loan to value ratio on new mortgages was just 49% in December 2017 and the banks' capital adequacy ratio is well above international standards (CET1 for the Hong Kong banking system was around 15% of risk-weighted assets in 2017 Q3). In part, this reflects previous HKMA decisions to raise the countercyclical capital buffer. This currently stands at 1.875% and is due to rise to 2.5% in January 2019.

A serious shock in China and Hong Kong would affect UK financial stability through a range of direct and indirect channels. A serious downturn in China and Hong Kong is likely to have a significant impact on UK financial stability through several channels.(2) UK banks have significant assets in China and Hong Kong (representing nearly 200% of CET1) (**Chart A.27**). In addition, UK banks also have large exposures to Japan, Korea, Singapore and Taiwan (over 140% of CET1), which have close trade links with China.

The degree of integration of China into the global financial system remains limited and portfolio investment in the country is low relative to the size of its economy: UK-based investment managers held just 1.2% of their assets (US$41 billion) in securities from China, Hong Kong and Macao in June 2017. However, a shock in China may still have a large impact on a broad range of financial asset prices by affecting risk sentiment — for example, the 8% drop in the Chinese stock market on 24 August 2015 spilled over to equity markets elsewhere, with advanced-economy and EME stock market indices falling by 4%–5% on the day.

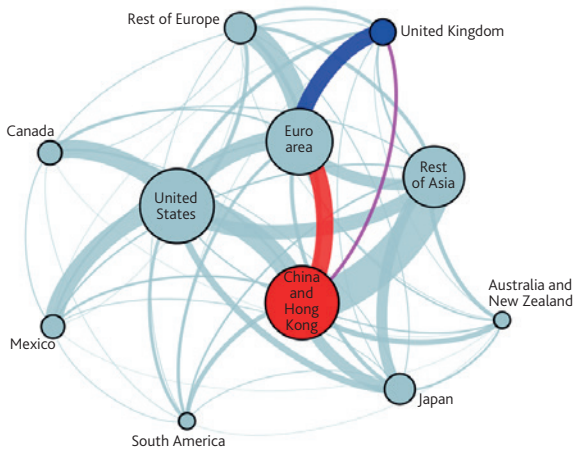
China is also deeply embedded in international trade networks (**Figure A.1**). It plays a major role in international supply chains, accounts for a large share of global demand for a wide range of commodities produced by other EMEs and is also becoming an increasingly important market for final products. Although the UK has only moderate direct trading exposures to China (around 4.7% of UK exports go to China and Hong Kong), indirect links are also important, as many of the UK's most important trading partners in Europe have strong trade links with China.(3)

Trade tensions have intensified

Trade tensions have intensified. The United States has introduced tariffs on imports of steel and aluminium from

Figure A.1 China is now deeply embedded in international trade networks

Network of global goods trade, 2017(a)



Sources: IMF Direction of Trade Statistics.

(a) Line thickness is proportional to total goods trade between regions. Circle size is proportional to regions' total goods trade with the other regions shown in the chart. Pink line denotes the UK's direct trade links with China and Hong Kong, and the blue and red lines illustrate the UK's indirect links to China and Hong Kong via the euro area. Data based on nominal 2017 US dollars.

(2) Recent Bank research estimates that a 'hard landing' in China which resulted in the level of GDP being 10% lower three years after the shock would reduce the level of UK GDP by 1.3%–1.4% at the peak. Amplification effects through financial markets could lead to the ultimate impact on the UK being twice as large as this.

(3) Goods exports from Germany to China and Hong Kong accounted for 7.4% of German goods exports in 2017, with German goods exports to other Asian economies coming to another 6%.

most other countries (the only exceptions are Argentina, Australia, Brazil and South Korea) and has announced its intention to impose tariffs on a wider range of imports from China. In response, several countries have announced retaliatory measures. In the near term, this poses risks in global financial markets, which could contribute to a further tightening in financial conditions, and could weigh on business confidence. Over a longer horizon, a sustained retreat from global integration could lead to lower growth and higher domestic risks.

The FPC has included a severe scenario for the euro area and China in its latest stress test.

The 2018 annual cyclical scenario includes a drop in global GDP of 2.4% in the first year of the stress, a larger fall than in the global financial crisis. In this scenario, euro-area GDP contracts by 3.6% in the first year, while GDP growth in China slows from just under 7% to -1.2%. In 2017 major UK banks were found to be resilient to this stress scenario.

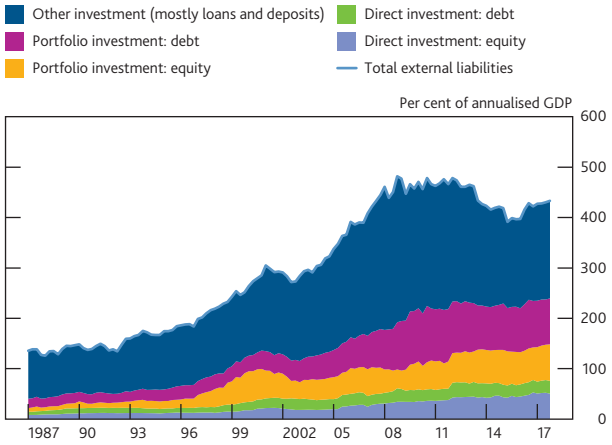
UK external financing

Supported by risk appetite in global markets, investment in UK assets by foreign investors has increased over the past two years and the share of capital inflows vulnerable to refinancing risk has risen. This makes the UK more vulnerable to a reduction in foreign investor appetite for UK assets, which could lead to a tightening in credit conditions for UK households and businesses. The share of inflows into UK commercial real estate and UK leveraged loan markets has been particularly marked.

Major UK banks were found to be resilient to external financing risks in the 2017 stress test, and will be tested against these risks again in 2018.

Chart A.31 The UK has a large stock of external liabilities

UK gross external liabilities by type[a]

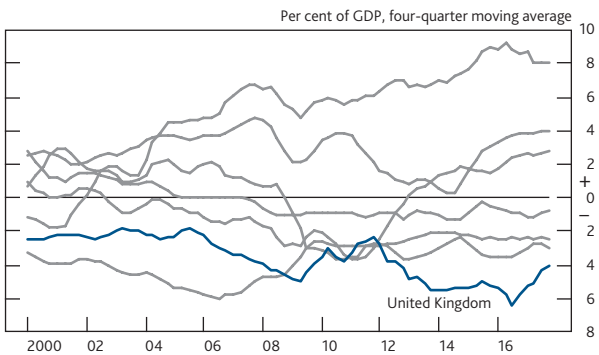


Sources: ONS and Bank calculations.

(a) Excludes derivatives.

Chart A.32 The UK has the widest current account deficit in the G7

G7 current account balances[a]



Source: OECD, Key Short-Term Economic Indicators: Current Account % of GDP, OECD.Stat, accessed on 12 June 2018.

(a) G7 countries are: Canada, France, Germany, Italy, Japan, UK and US.

The UK has a large stock of assets held by foreign investors…

The UK is one of the most financially open major advanced economies in the world. This openness means that economic conditions in the UK are affected by the behaviour of foreign investors. Overseas residents have significant holdings of UK assets. These 'external liabilities' have grown as a share of GDP in recent years — although they remain below their crisis peak — and amounted to 433% of annualised GDP in 2017 Q4 (**Chart A.31**). UK residents also have significant investments abroad ('external assets'), amounting to 418% of GDP.(1) The large external balance sheet of the UK reflects substantial cross-border capital flows in recent decades.

…and a material current account deficit.

Inward capital flows have been used to finance the UK's current account deficit. A current account deficit means that domestic investment is greater than saving, and must be financed by net borrowing from overseas. This can be achieved either by UK residents reducing their external assets or increasing their external liabilities through inward flows. The UK current account deficit has narrowed, but remains high by international standards and is the widest deficit among the G7 countries (**Chart A.32**).

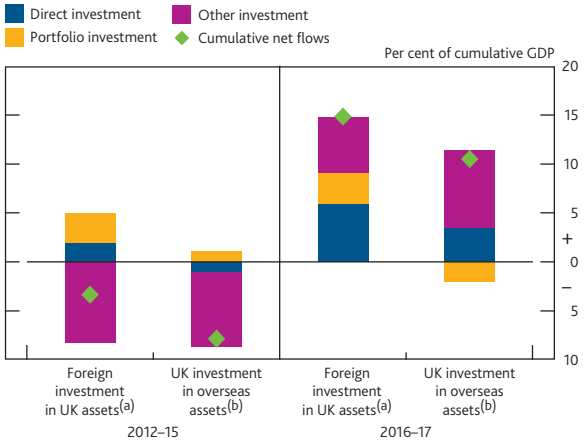
Capital inflows from foreign investors have increased over the past two years…

Over the period 2012–15 foreign investors were selling UK assets and UK investors sold overseas assets at a faster rate, which meant that the UK's stock of external assets and liabilities was shrinking over that period and the funding of the deficit was not reliant on gross inflows from overseas investors. However, since the beginning of 2016, this position has reversed: UK residents have been net buyers of foreign

(1) Excluding derivatives.

Chart A.33 Capital inflows to the UK have increased over the past two years

Cumulative inward and outward capital flows since 2012

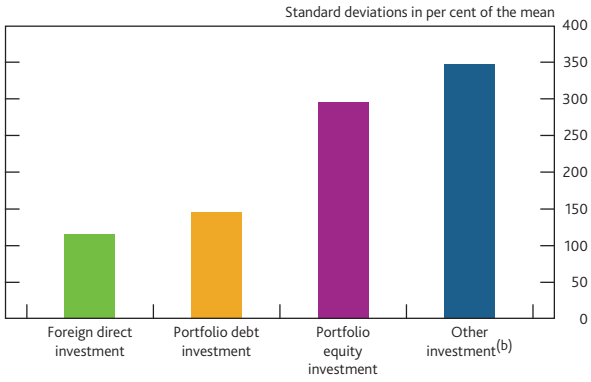


Sources: ONS and Bank calculations.

(a) Net acquisition of foreign liabilities by UK residents.
(b) Net acquisition of foreign assets by UK residents.

Chart A.34 Flows in the 'other investment' category are very volatile

Coefficient of variation of quarterly inward investment in per cent of GDP for G7 countries 1996–2017(a)

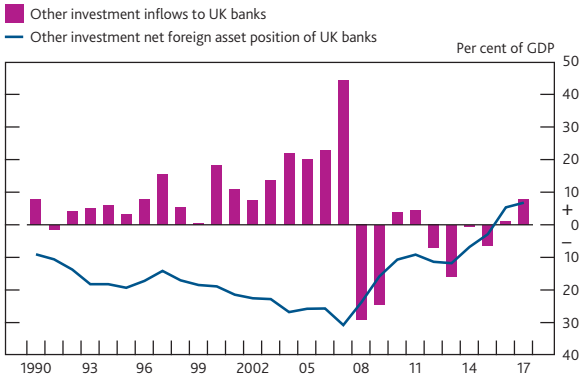


Sources: IMF IFS, OECD, Key Short-Term Economic Indicators: GDP, OECD.Stat, accessed on 12 June 2018, Thomson Reuters Datastream and Bank calculations.

(a) The chart shows the coefficient of variation of each type of inward investment flow in per cent of GDP averaged across G7 countries.
(b) 'Other investment' consists mostly of loans and deposits.

Chart A.35 The UK banking sector is a net lender to the rest of the world

Other investment inflows and net foreign asset position of the UK banking sector(a)



Sources: ONS and Bank calculations.

(a) 'Other investment' consists mostly of loans and deposits.

assets. Foreign capital inflows have been substantial (**Chart A.33**), supported by risk appetite in global markets (see Global debt market conditions chapter). For example, in 2017, net purchases of UK assets by overseas residents were the largest they have been since 2010, at 21.5% of annual GDP.

…leaving the UK vulnerable to a reduction in foreign investor appetite, which could lead to a tightening in credit conditions for UK households and businesses.

The ability of the UK to refinance its large stock of external liabilities and to fund its current account deficit is affected by overseas investors' willingness to continue to hold UK assets. Sharp falls in foreign investor appetite for UK assets could lead to falls in UK asset prices and a tightening in domestic credit conditions. This could be triggered, for example, by perceptions of weaker or more uncertain UK long-term growth prospects.

Looking ahead, the ease with which the current account deficit is financed will rest on the credibility of the UK macroeconomic policy framework and its continuing openness to trade and investment.

More recently, the proportion of UK capital inflows vulnerable to refinancing risk has risen.

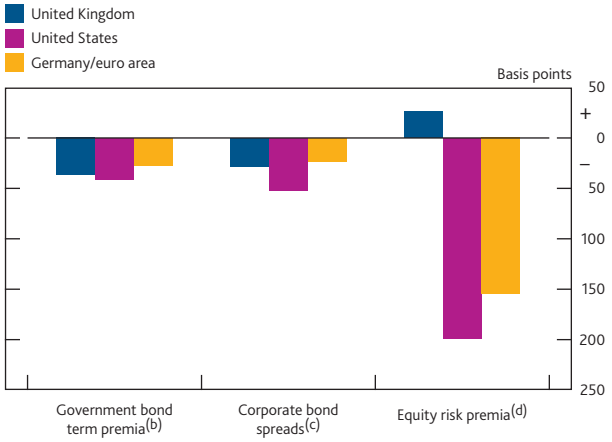
Although much of the inflow of capital into the UK has taken the form of equity investment (ie equity foreign direct investment (FDI) and equity portfolio investment), which is not susceptible to refinancing risk, a material share of inflows has been in the 'other investment' category (**Chart A.33**). An important component of this category is inflows of wholesale deposits to banks, which can be short term and therefore subject to refinancing risk. Annual foreign inflows into the UK banking sector in the form of loans and deposits in 2017 were at their highest level since the global financial crisis. Historically in the UK, inward capital flows in the 'other investment' category have been more volatile than portfolio flows and FDI (**Chart A.34**).

But there are factors mitigating refinancing risks stemming from the size and composition of foreign capital inflows.

Banks' reliance on short-term funding (excluding repo financing) has fallen substantially since the crisis. At end-2017 it accounted for just 3.8% of large UK banks' total funding compared to 15.9% in 2007 (see **Chart C**, The improvement in UK banking sector resilience since the financial crisis box). Furthermore, 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. The more exposed they are to refinancing risk, the greater the safety buffer they should have in place. UK banks have material short-term foreign currency liabilities, representing over half of their overall wholesale liabilities, at around £270 billion. These exposures are covered, in aggregate, by banks' foreign currency denominated liquid

Chart A.36 UK equity risk premia have not fallen in line with euro-area and US equivalents since 2016

Changes in risk premia on UK, US and euro-area assets since 4 January 2016(a)

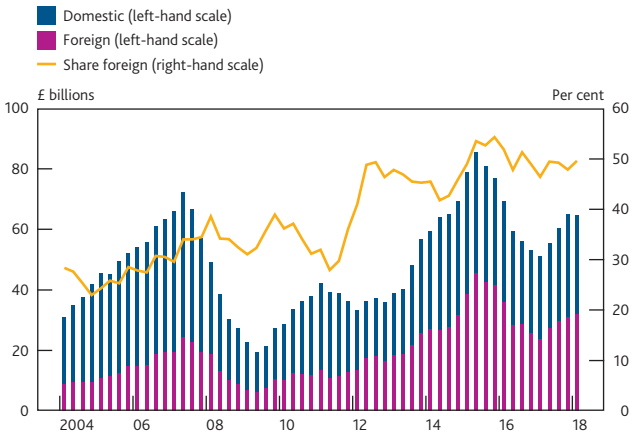


Sources: Bloomberg Finance L.P., Federal Reserve Bank of New York: Federal Reserve Board, HM Treasury, ICE BofAML, IMF *World Economic Outlook*, Thomson Reuters Datastream and Bank calculations.

(a) Data to 15 June 2018.
(b) UK daily term premium estimate is an average from four model outputs: benchmark and survey models, including Malik, S and Meldrum, A (2016), 'Evaluating the robustness of UK term structure decompositions using linear regression methods', *Journal of Banking & Finance*, Vol. 67, June, pages 85–102; Guimarães, R and Vlieghe, G (2016), 'Monetary policy expectations and long term interest rates', unpublished working paper; and Andreasen, M and Meldrum, A (2015), 'Market beliefs about the UK monetary policy lift-off horizon: a no-arbitrage shadow rate term structure model approach', *Bank of England Staff Working Paper No. 541*. Germany/euro area daily term premia are for Germany and are based on the model described in Malik, S and Meldrum, A (2016), as above. US daily term premia are estimates from the Federal Reserve Bank of New York.
(c) Based on investment-grade corporate bonds. 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.
(d) As implied by a dividend discount model. Equity risk premia are estimated for the FTSE All-Share, S&P 500 and Euro Stoxx indices.

Chart A.37 Foreign investors make up a large proportion of UK CRE transactions

UK CRE transactions, moving sum of four quarters



Sources: Property Archive and Bank calculations.

assets, which are around £330 billion.(2) UK banks also have access to additional funds through the Bank of England's normal liquidity operations and facilities. The Bank is also able to provide substantial liquidity in foreign currency, if required.

In contrast to the decade prior to the crisis, the UK banking sector is a net lender to the rest of the world (**Chart A.35**). In effect, the UK banking sector has been purchasing foreign assets at a faster rate than it has been accumulating foreign liabilities. This could also partly mitigate the impact of a reversal in 'other investment' flows on the domestic economy.

Finally, at an aggregate level, UK residents hold more foreign currency assets than liabilities. This mitigates the economic risks associated with currency depreciation. In contrast to this aggregate position, UK-resident non-financial businesses hold more foreign currency liabilities than assets, but risks from currency depreciation are partly mitigated by hedging (see the November 2017 *Report*).

Foreign investors are a large presence in UK commercial real estate (CRE) and UK leveraged loan markets.

Demand for most UK asset classes has been broadly stable over the past year. The compensation investors demand for holding longer-maturity assets (the 'term premium') is below its historical average, as are sterling corporate bond spreads (see Global debt marketing conditions chapter). Both of these measures have continued to move in line with those for other advanced economies (**Chart A.36**). This increase in global risk appetite means that foreign investment in riskier UK assets — such as UK CRE and leveraged loans — has also increased.

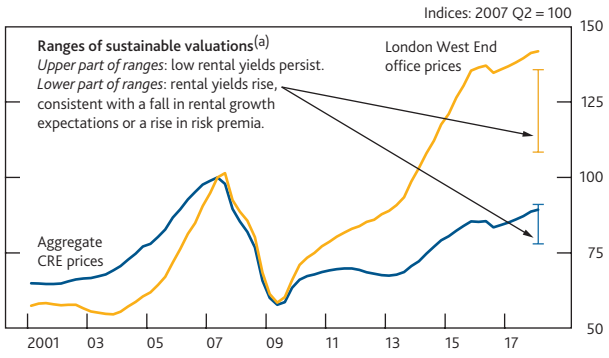
Foreign investor transactions in UK CRE, which had fallen sharply in the months leading up to the referendum, have continued to recover. Foreign investors, notably from the United States and Asia, accounted for 50% of transactions in UK CRE in 2018 Q2 (**Chart A.37**), rising to 73% in London. This flow underpins the level of valuations in UK CRE, which continue to appear stretched in some segments. Current prices are at the top end of estimated sustainable values (**Chart A.38**). Some segments of the CRE market appear more stretched than the aggregate picture. Valuations are particularly stretched in the central London office market, even under the benign assumptions that historically low discount rates persist and that rental growth returns to historically average levels.

An adjustment of CRE prices — perhaps triggered by a sudden reduction in foreign investor appetite — could affect the supply of credit to the real economy. CRE is widely used as collateral for corporate borrowing: a 2015 Bank of England review of bank lending to small and medium-sized companies suggested that 75% of those companies that borrow from

(2) These figures are for the seven largest UK banks.

Chart A.38 UK CRE prices look stretched based on ranges of sustainable valuations

Commercial real estate prices in the UK and ranges of sustainable valuations

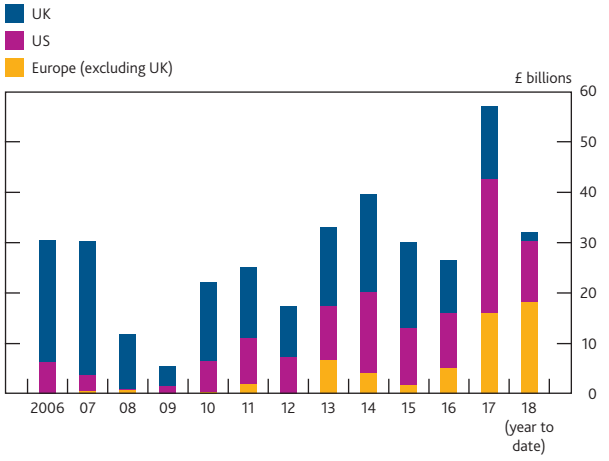


Sources: Bloomberg Finance L.P., Investment Property Forum, MSCI Inc. and Bank calculations.

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

Chart A.39 A record level of UK leveraged loans and high-yield bonds were syndicated abroad in 2017

Gross issuance of leveraged loans and high-yield bonds by UK PNFCs syndicated in the US and Europe(a)(b)



Sources: Bank of England, LCD, an offering of S&P Global Market Intelligence and Bank calculations.

(a) Based on public syndication transactions, and excluding private bilateral deals.
(b) Includes loans issued for refinancing purposes, and does not account for repayments of outstanding loans.

banks use CRE as collateral. Therefore, an amplified downturn in the CRE market could be transmitted to the real economy by reducing companies' access to bank loans and their ability to undertake new investment. Research by Bank staff suggests that every 10% fall in UK CRE prices is associated with a 1% decline in UK economy-wide investment.

A record level of leveraged loans and high-yield bonds issued by UK corporates were syndicated abroad in 2017 (**Chart A.39**) (see Global debt market conditions chapter).

UK-focused equities continue to be impacted by uncertainty.

Within this overall picture, there is evidence that investor appetite for UK equities has remained weak since the EU referendum. The UK equity risk premium, which measures the compensation investors require for investing in risky equities, has increased relative to measures for euro-area and US equities (**Chart A.36**). Market contacts over the past two years have highlighted uncertainty about the UK's future trading relationship with the EU as a particular concern. A net balance of 21% of respondents to the June Bank of America Merrill Lynch Global Fund Manager survey reported that they were underweight UK equities, down from 37% in November, but still higher compared to its average since 1999 of 12%.

The FPC has assessed major UK banks' resilience to external financing risks in the 2017 stress test, and will do so again in 2018.

Overall, direct risks to UK banks from the UK's external financing position appear limited. Instead, a withdrawal of capital from the UK could threaten financial stability indirectly, through its potential impact on the UK economy. Any wider economic disruption triggered by outflows of capital from the UK could lead to losses for banks on a wide range of UK exposures, testing their resilience.

The FPC is vigilant to the risks posed by the UK's external financing position. The annual cyclical scenario for the Bank's 2017 stress test incorporated a sudden increase in the rate of return investors demand for holding sterling assets and falls in residential and commercial property prices. The sterling exchange rate index fell by 27%, larger than any historical move to date, and Bank Rate rises to 4%, alongside a fall in domestic demand. The 2017 stress-test scenario was more severe than the global financial crisis. This scenario resulted in over £70 billion in impairments on lending to the UK households and businesses. Major UK banks were resilient to this stress in the 2017 test, which will be repeated in 2018.

UK household indebtedness

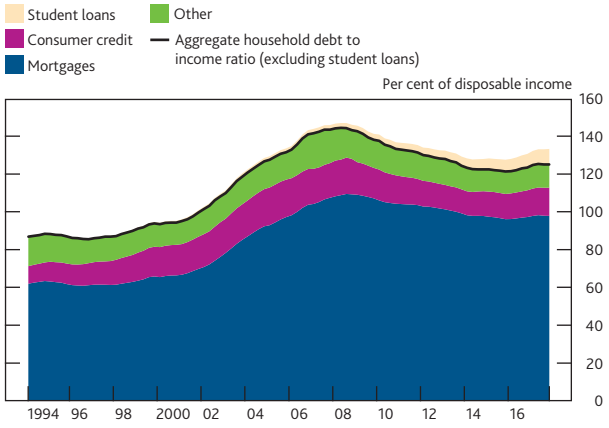
Although banks' risk appetite in mortgage lending has increased over the past few years, weak demand has kept mortgage credit growth modest. The FPC's mortgage market Recommendations have insured against any significant increase in the number of highly indebted households. And in recent months mortgage supply conditions have shown some modest signs of tightening, with a rise in mortgage rates relative to risk-free rates and a fall in the proportion of lending at high loan to income multiples.

The outstanding stock of consumer credit continues to grow rapidly, but there have been some signs of tightening lending standards over the past year.

Following the completion of the 2017 stress test, banks' regulatory capital buffers were set so that each bank was able to absorb its projected losses on mortgage and consumer lending, alongside all the other effects of the stress scenario on its balance sheet.

Chart A.40 Household debt relative to income is high, but materially below its 2008 peak

UK household debt to income ratio[a]



Sources: Bank of England, ONS and Bank calculations.

(a) All data are seasonally adjusted unless otherwise stated. Household sector liabilities as a percentage of four-quarter moving sum of household disposable income. Household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM). Household sector liabilities exclude unfunded pension liabilities and financial derivatives associated with non-profit institutions serving households (NPISH), and are non seasonally adjusted. The stock of outstanding income-contingent student loans has been projected to 2017 Q4 using historical growth rates. Other household sector liabilities include loans to unincorporated businesses (for example, sole traders), loans to NPISH, and household bills that are due but not yet paid.

The level of household indebtedness relative to incomes in the UK remains high, but is materially below its 2008 peak, and credit growth is moderate.

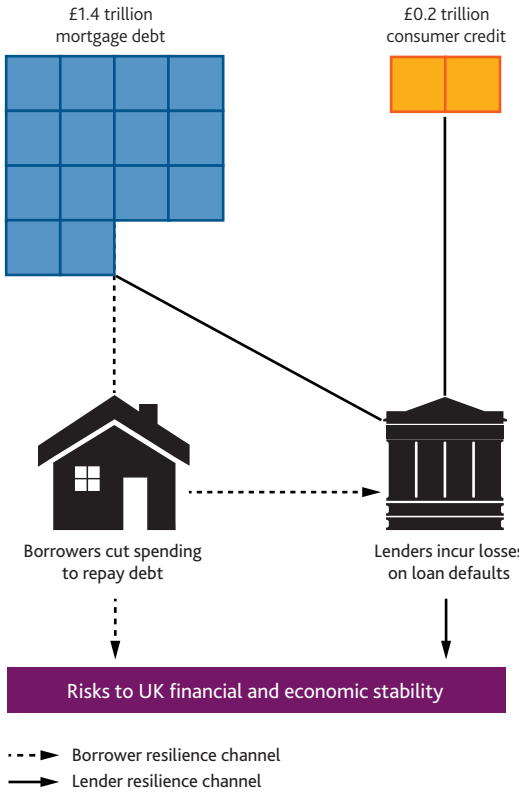
The total stock of UK household debt in 2017 Q4 was £1.8 trillion. Around 75% of that debt (£1.4 trillion) was accounted for by mortgage debt (**Chart A.40**). Household debt (excluding student loans) amounts to 125% of household incomes, high by historical standards but materially below its 2008 peak of 144%, as UK households have reduced debt substantially since the crisis.(1) The growth rate of household debt remains moderate, at an annual rate of 4.1% in April 2018, well below its 1997–2006 average of 10.4%.

Debt provides benefits to the economy by allowing people to make purchases that they otherwise would not be able to pay for in one go, smoothing their consumption over time. However, high household indebtedness can pose risks to UK financial and economic stability. The FPC has previously identified two main channels through which high levels of household debt can pose risks to the UK financial system or the wider economy (**Figure A.2**).

- **Borrower resilience**: Highly indebted households are more vulnerable to unexpected falls in their incomes or increases in their loan repayments. In an economic downturn, highly indebted households may cut back sharply on other

(1) These estimates exclude student loans from the measure of household debt. Repayments on UK student loans are income-contingent, unlike most other forms of household debt. Outstanding student loans are estimated to amount to 8% of disposable household income in 2017 Q4, their highest-ever level. Including student debt, household debt to income ratio is 133%, 19 percentage points below its peak.

Figure A.2 Household debt poses risks to UK financial stability and the UK economy through two main channels



Sources: Bank of England and ONS.

Chart A.41 Mortgage lending growth has been modest

Twelve-month growth rate of mortgage lending[a]

Source: Bank of England.

(a) Twelve-month growth rate of total sterling net secured lending to individuals seasonally adjusted.

spending in order to continue to service their debts, making the downturn worse. In doing so, they pose an indirect risk to financial stability, as this increases the risk of losses to lenders on all forms of lending. The FPC judges that this channel is most material for mortgage debt.

- **Lender resilience**: The resilience of lenders could be tested if highly indebted households default on their debts in response to adverse shocks, resulting in losses for the lender. This poses a direct risk to UK financial stability. The FPC judges that this channel is relevant for consumer credit, and also for mortgage debt in a severe stress.

Both types of resilience will be particularly tested if underwriting standards have loosened.

Headwinds to mortgage demand, including from weak income growth, have dragged on mortgage activity.

Mortgage lending growth has been modest and house price inflation has fallen over the past two years. Mortgage lending growth was 3.4% in the year to April 2018, around a third of its 1997–2006 average of 9.7% (**Chart A.41**). National house price inflation slowed to 2% in May 2018, from around 7.5% at its recent peak in 2016 Q1 (**Chart A.42**).

Within that aggregate picture, the number of buy-to-let mortgage approvals has weakened significantly following the tax policy changes in April 2016 and April 2017,[2] and homemover approvals have remained weak (**Chart A.43**). But first-time buyer approvals have risen to their highest levels since the financial crisis.

These developments in the housing market are likely to have reflected headwinds to demand from the squeeze in real incomes, the tax changes described above, and lower consumer confidence.

Some easing of mortgage pricing and underwriting conditions over the past few years has helped to partly offset these headwinds.

Some easing in price and non-price terms in the mortgage market over the past few years has probably acted to support mortgage lending.

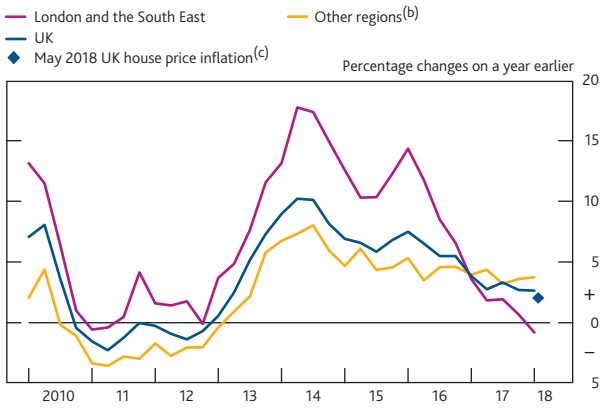
The quoted spreads on new two-year fixed-rate mortgages at 90% and 75% loan to value (LTV) ratios have fallen by around 95 basis points and 65 basis points since their recent peaks in 2016 (**Chart A.44**).

The falls in spreads since 2016 reflect — to a significant extent — falling bank funding costs, but they may also be a result of growing lender risk appetite, as lenders have sought to maintain volumes in the face of weaker demand. In recent discussions, lenders attributed some of the reduction in

(2) These changes include an increase in stamp duty land tax for additional properties and a reduction in the scope for mortgage interest tax relief.

Chart A.42 House price inflation has fallen, largely driven by London and the South East

House price inflation[a]

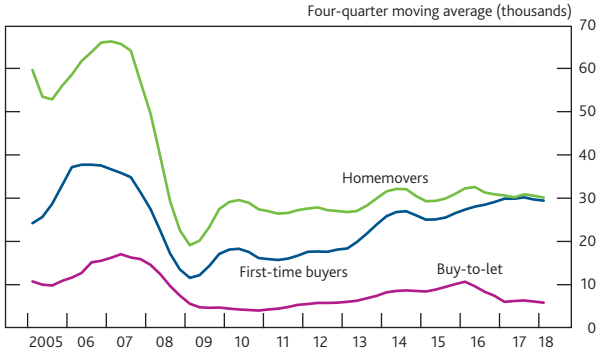


Sources: IHS Markit and Nationwide.

(a) Average of the quarterly Halifax/IHS Markit and Nationwide house price indices.
(b) Unweighted average of house price inflation in different regions.
(c) Based on 12 months to May 2018.

Chart A.43 Mortgage approvals have remained modest in recent quarters

Mortgage approvals for house purchase by type of buyer[a]

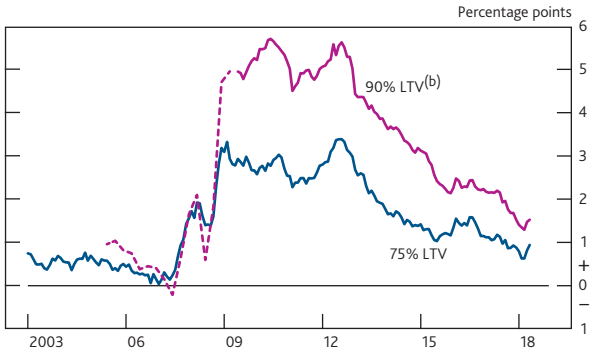


Sources: Bank of England, UK Finance and Bank calculations.

(a) The split of approvals by borrower type is based on UK Finance mortgage completions data. Series have been smoothed to account for data volatility.

Chart A.44 Quoted spreads on new mortgage lending have narrowed since mid-2016

Mortgage rates on new owner-occupier two-year fixed-rate mortgages relative to risk-free rates[a]



Sources: Bank of England, FCA Product Sales Database and Bank calculations.

(a) Spreads are taken relative to the risk-free rate of the same maturity.
(b) Dashed line is an estimate of historical 90% LTV spreads, which uses rates reported on new mortgages in the FCA Product Sales Database.

spreads to intensifying competition. Smaller banks have been playing an important role in new lending to households. In the 12 months to end-April, smaller banks — that account for around a fifth of the outstanding stock of household lending — have delivered over 40% of the new lending to UK households (see Banking sector resilience chapter).

In addition, the forthcoming 'ring-fencing' of major UK banks, whereby core retail banking activities are separated from investment and international banking activities, may also be affecting competitive dynamics in the mortgage market. Some banks will have more domestic customer deposits than domestic loans in the ring-fenced banking part of their banking group, and given the activity restrictions on ring-fenced banks, they may be incentivised to use these deposits to increase domestic mortgage lending.

Non-price terms on mortgages have also eased over recent years. For example, lending at higher loan to income (LTI) ratios has increased. The share of new owner-occupier mortgage lending at LTI multiples between 4.0 and the FPC's flow limit of 4.5 (described below) increased from 11.6% in 2015 Q1, to 14.8% in 2016 Q1 and 17.8% in 2018 Q1 (**Chart A.45**). However, the share of loans extended at LTI ratios at or above 4.5 has only increased slightly.

Mortgage market activity and house price growth have been more modest in London and the South East, where house price to income ratios, and thus LTI ratios, tend to be higher. LTIs in London and the South East have not increased as much as in other regions over the past couple of years. In addition, the slowing in the buy-to-let market has affected London and the South East more, given that almost a half of buy-to-let approvals are concentrated there. Mortgage approvals in London and the South East in the year to March 2018 were around 15% lower relative to their recent peak in the year to March 2016, while they have stayed broadly flat in other regions. And house prices were broadly flat in London and the South East in the year to March 2018, but have grown by close to 4% in other regions (**Chart A.42**).

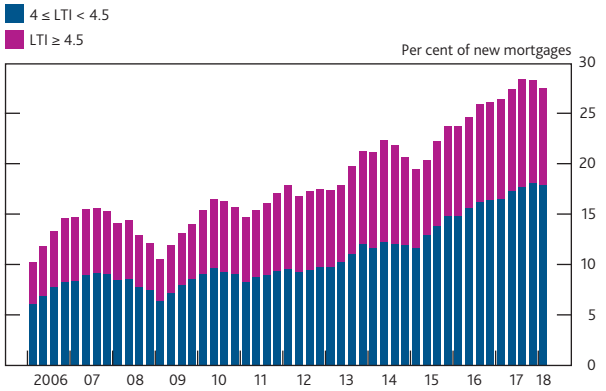
The number of highly indebted households has increased marginally over the past couple of years…

The characteristics of the stock of outstanding mortgage debt have deteriorated a little, consistent with the loosening in underwriting standards. The average debt-servicing ratio (DSR) on the stock of mortgages (ie the share of income spent on servicing mortgage debt) remains low, supported by low interest rates.[3] However, the share of households with mortgage DSRs at or above 40% (the percentage beyond

(3) Consumption of households with variable-rate mortgages is likely to be more sensitive to changes in interest rates. Within that group, there are households paying a high reversion interest rate who would benefit from switching their mortgage but are unable to do so. According to *Mortgages Market Study: Interim Report*, published by the Financial Conduct Authority in May 2018, the number of such households (referred to as 'mortgage prisoners') was small in the second half of 2016, representing less than 2% of regulated mortgages on a reversion rate. This suggests the associated financial stability risks from potential severe cuts to consumption by these households are low.

Chart A.45 The proportion of lending at LTI ratios between 4.0 and 4.5 has increased since 2015

Proportion of new owner-occupier mortgages extended at different LTI ratios(a)(b)(c)

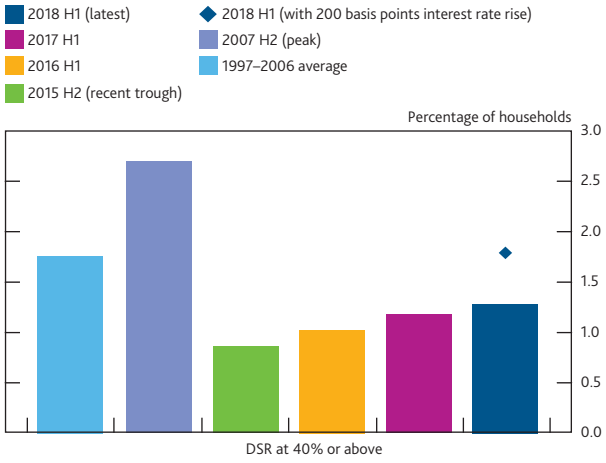


Sources: FCA Product Sales Database and Bank calculations.

(a) The Product Sales Database includes regulated mortgage contracts only. 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 amount borrowed.
(b) Includes loans to first-time buyers, and council/registered social tenants exercising their right to buy.
(c) Data include regulated mortgage contracts only, and therefore exclude other regulated home finance products such as home purchase plans and home reversions, and unregulated products such as second charge lending and buy-to-let mortgages.

Chart A.46 The proportion of households with mortgage DSRs at or above 40% has increased to 1.3%

Share of households with high mortgage DSRs(a)(b)



Sources: British Household Panel Survey and NMG Consulting survey.

(a) 2007 H2 peak and the 1997–2006 average are based on data from British Household Panel Survey. Other bars are based on data from the NMG Consulting survey.
(b) Mortgage DSR calculated as total mortgage payments as a percentage of pre-tax income.

which households are typically much more likely to experience repayment difficulties) increased to 1.3%, from its recent trough of 0.9% in 2015 H2. It would reach its 1997–2006 average if interest rates increased by 200 basis points (**Chart A.46**).(4) The share of households with LTI ratios at or above 4 has increased from 2.8% to 3.3% over the same period, according to the NMG Consulting survey.

…but the FPC's mortgage market Recommendations have insured against a significant increase…

The FPC's mortgage market Recommendations continue to guard against a more marked loosening in underwriting standards and a significant increase in the number of highly indebted households.

The FPC's 2014 LTI flow limit Recommendation restricts the number of mortgages extended at LTI ratios at or above 4.5 to 15% of a lender's new mortgage lending.

The FPC's affordability test recommends that mortgage lenders test whether borrowers could still afford their mortgages if, at any point over the first five years of the loan, their mortgage rate were to be 3 percentage points higher than the reversion rate specified at origination.

…limiting the risk of bank losses on mortgage debt…

Mortgage debt is an important source of direct losses to banks. It accounts for as much as two thirds of major UK banks' loans to UK borrowers and a quarter of projected losses on these loans in the 2017 stress test.

However, the increase in the number of highly indebted households has only been marginal (**Chart A.46**), limiting the effect on bank resilience. Similarly, the share of the stock of owner-occupier mortgages with LTV ratios at or above 75%, which was falling consistently between 2011 and 2016, has increased only slightly since then (**Chart A.47**). Lending at high LTV ratios is more likely to lead to high losses for lenders in a stress, because it results in less collateral in the event of borrower default.

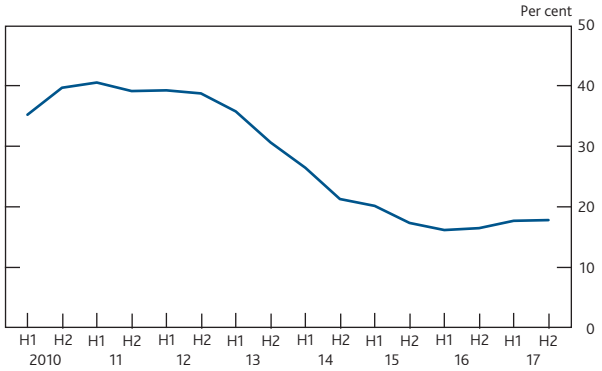
…as well as on all other forms of lending.

The risk of sharp cutbacks in consumption by the most highly indebted households following adverse shocks has been shown to amplify past downturns in the UK and elsewhere.(5) This can increase the risk of losses by banks on all forms of lending, not just mortgages.

(4) For a review of different measures of household vulnerability, see Box 1 'Survey measures of household vulnerability' in the November 2017 *Report*. For example, 'The financial lives of consumers across the UK: key findings from the FCA's Financial Lives Survey 2017' (June 2018) uses questions about survey respondents' own perception of their broader circumstances, including health condition and life events. Using this broad definition, the report identifies that a half of UK adults are 'potentially vulnerable'. This metric is useful when considering consumer protection issues, for example by identifying those that consider themselves as having low knowledge of financial matters. But it is too wide from a financial stability perspective, which focuses on the risk that highly indebted households could cut back sharply on spending or default on their debts in response to adverse shocks.
(5) See, for example, June 2014 *Report*; Bunn, P and Rostom, M (2015), 'Household debt and spending in the United Kingdom', *Bank of England Staff Working Paper No. 554*; IMF *World Economic Outlook*, Chapter 3, April 2012.

Chart A.47 The share of the stock of UK mortgages with LTV ratios at or above 75% has increased only a little since 2016

Share of the stock of owner-occupier mortgages for UK lenders with LTV ratios at or above 75%[a][b]

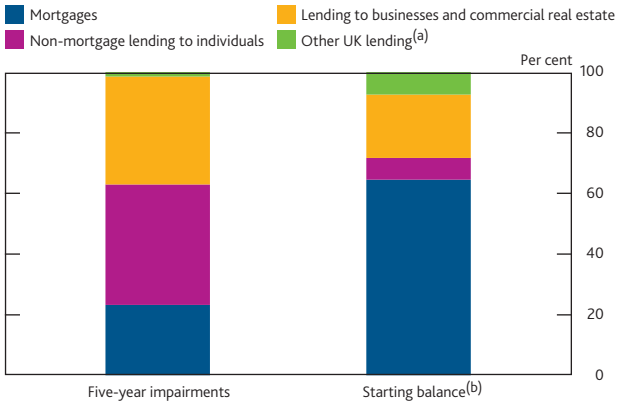


Sources: PRA regulatory returns and Bank calculations.

(a) This series was created by combining different regulatory returns. Definitions of product types will differ slightly between sources.
(b) Between 2009–2013, LTV data are for Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, National Australia Group, Nationwide, RBS, Santander UK, some small residual elements of old Bradford & Bingley and Northern Rock books, and all UK building societies. From 2014 onwards, LTV data cover all UK banks and building societies.

Chart A.48 Consumer credit accounted for a large share of banks' losses in the 2017 stress test

Breakdown of major UK banks' impairments and starting balances for UK lending in the 2017 stress test



Sources: Participating banks' Stress Testing Data Framework data submissions, Bank analysis and calculations.

(a) Other UK lending includes exposures to financial institutions, local and central government, public sector entities and smaller wholesale portfolios.
(b) Starting balance refers to the end-2016 balances.

Because the FPC mortgage market Recommendations continue to guard against a significant increase in the number of highly indebted households, they also reduce this indirect risk to banks.

And in recent months, mortgage supply conditions have shown some modest signs of tightening.

In the past few months, the trend to looser lending standards has shown some signs of reversing. With bank funding costs rising in line with those for corporates more generally (see Banking sector resilience chapter), spreads between mortgage rates and risk-free rates have increased, returning to levels of late 2017 (**Chart A.44**). And the proportion of owner-occupier mortgages originated at LTI multiples at or above 4 fell back a little in 2018 Q1 (**Chart A.45**).

Consumer credit exposures are an important determinant of bank losses in a downturn.

Loss rates on consumer credit are far higher than for mortgages, as borrowers are much more likely to default on their consumer credit loans in the face of adverse shocks. And because the majority of consumer credit is unsecured, lenders cannot rely on the value of collateral to cushion their losses. Thus, even though consumer credit only accounted for around 7% of UK banks' domestic loans in the 2017 stress test, it contributed to nearly 40% of projected losses on these loans (**Chart A.48**).

Consumer credit growth remains rapid but has slowed over the past year. The FPC and Prudential Regulation Committee have previously acted to help ensure lenders are able to absorb severe losses on consumer credit.

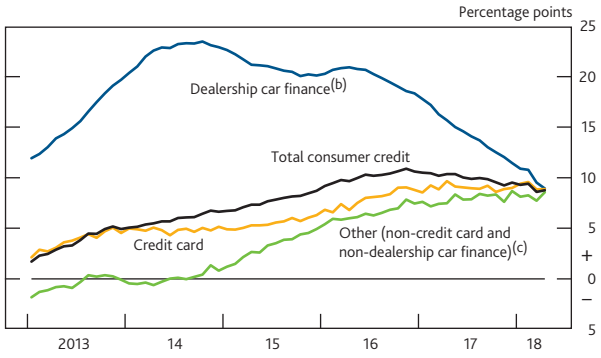
Consumer credit growth remains rapid, at 8.8% in the 12 months to April 2018. It has slowed from a peak of 10.9% in November 2016. The slowdown over that period is due to car finance, where banks do not have material exposure,[6] while the growth of other types of consumer credit has remained stable, at a rapid rate, in that period (**Chart A.49**).

The slowdown in consumer credit growth is consistent with a reduction in demand as well as some tightening in supply. Slower car finance growth may be driven by the wider weakness in the car market, reflected in falls in new car registrations since end-2016. In addition, the structural shift increasing the share of cars purchased with some form of car finance may also have come to an end.[7] More generally, the reduction in credit demand may be linked to slightly lower consumer confidence.

(6) As explained in the June 2017 *Report*, because this lending is secured, arrears on car finance tend to be lower than on other types of consumer credit, and the value of collateral may cushion banks' losses in the event of default. In addition, according to a review by the Financial Conduct Authority using data up to 2016, most of the growth in car finance in that period was to consumers with lower credit risk. See 'Our work on motor finance – update', Financial Conduct Authority, March 2018.
(7) See Box 4 'Implications of recent developments in the car market for consumer spending' in the May 2018 *Inflation Report*.

Chart A.49 Consumer credit continues to grow rapidly, although it has been slowing since end-2016

Annual growth rate of consumer credit products[a]

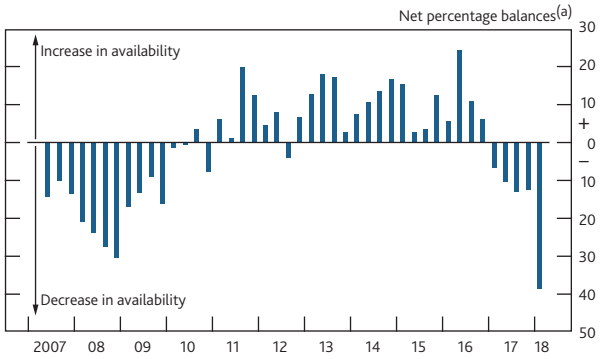


Sources: Bank of England, ONS and Bank calculations.

(a) Sterling net lending by UK monetary financial institutions (MFIs) and other lenders to UK individuals (excluding student loans). Seasonally adjusted.
(b) Identified dealership car finance lending by UK MFIs and other lenders.
(c) Other is estimated as total consumer credit lending minus dealership car finance and credit card lending.

Chart A.50 Lenders have been reporting a reduction in the availability of consumer credit

Respondents to the Bank's *Credit Conditions Survey* reporting an increase/reduction in the availability of unsecured lending over the previous quarter



Source: Bank of England *Credit Conditions Survey*.

(a) Net percentage balances are calculated by weighting together the responses of those lenders who answered the question by their market shares. Lenders who report that credit conditions have changed 'a lot' are assigned twice the score of those who report that conditions have changed 'a little'.

There have been some signs of consumer credit supply tightening over the past year and in particular in early 2018. A net percentage balance of 25% of lenders responding to the 2018 Q1 *Credit Conditions Survey* reported a tightening in credit scoring criteria for consumer credit and close to 40% of respondents reported tightening in the availability of consumer credit (**Chart A.50**). In addition, the average interest-free period on balance transfer credit cards has fallen to 26 months, compared with a peak of 30 months around a year ago.

The FPC and Prudential Regulation Committee (PRC) have previously acted to help ensure lenders are able to absorb severe losses on consumer credit. Their September 2017 judgement on the appropriate loss rate for the UK consumer credit sector had been used in the 2017 stress test. In the first three years of the 2017 stress-test scenario, the UK banking system was judged to incur UK consumer credit losses of around £30 billion, or 20% of UK consumer credit loans, representing 150 basis points of the aggregate common equity Tier 1 capital ratio of the UK banking system. This is approximately an extra £10 billion in impairments relative to the 2016 stress test.

The 2017 stress test showed that major UK banks were able to absorb losses on household debt associated with a severe stress scenario.

The Bank's annual stress tests assess major UK banks' resilience to risks from mortgage debt and consumer credit, as well as other forms of lending, in a severe downturn. The Bank's 2017 annual cyclical scenario included a rise in Bank Rate to 4%, combined with a large increase in unemployment and a 33% fall in house prices. Following the completion of the 2017 stress test, banks' regulatory capital buffers were set so that each bank was able to absorb its projected losses on mortgage and consumer lending, alongside all the other effects of the stress scenario on its balance sheet. Banks will be tested again against this scenario in 2018.

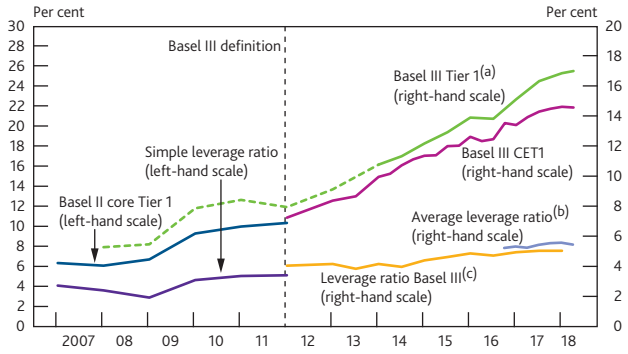
Banks participating in the 2017 stress test accounted for around 70% of the stock of consumer credit extended by the banking system. Smaller banks were not part of the annual stress-testing exercise but were included in the FPC's and PRC's September 2017 judgement about the losses on consumer credit that the UK banking system would incur in aggregate. Those smaller banks with material exposures to consumer credit have also been assessed against the 2017 scenario. Results of this analysis have not been published, but have guided supervisory strategy for those firms and will be considered as part of their subsequent capital assessment.

Banking sector resilience

The UK banking sector remains resilient. Banks' capital ratios have increased significantly since the global financial crisis and their liquidity positions are strong. While funding costs have risen moderately in recent months — in line with a tightening in credit markets more generally — they remain low by historical standards. This recent increase does not reflect reduced confidence in the resilience of the banking sector but rather a range of other factors driving a shift in the balance of supply and demand for bank debt.

The ability of important financial companies to resist cyber attack has been, and continues to be, tested. The FPC is now in the process of establishing standards for resilience to cyber risks (see Box 1). Banks, and other financial institutions, will be expected to show they can meet these standards in stress tests of cyber attacks. The new standards will specify how quickly companies should be able to restore critical services following a cyber attack.

Chart B.1 The UK banking system is well capitalised
Tier 1, CET1 and leverage ratios for the major UK banks



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

(a) From 2014, the 'Basel III Tier 1 capital ratio' is calculated as Tier 1 capital over risk-weighted assets. The CET1 element within Tier 1 and RWAs are according to the CRD IV definition as implemented in the United Kingdom. The additional Tier 1 element within Tier 1 excludes grandfathered instruments and other transitional adjustments. Prior to 2014, the chart shows Bank estimates; preference shares are used as a proxy for additional Tier 1 capital. The peer group includes Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK. From 2018, Basel III Tier 1 capital ratios reflect IFRS 9 transitional arrangements as agreed in European law.
(b) Leverage ratio with central bank reserves excluded from the exposure measure. The peer group includes Barclays, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK.
(c) The Basel III leverage ratio corresponds to aggregate Tier 1 capital over the 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. The exposure measure is based on the Basel 2014 definition for 2014 and the CRR definition from 2015 onwards. The peer group is the same as in footnote(a) above.

The UK banking system is well capitalised and resilient to deep simultaneous recessions in the UK and global economies.

The UK banking system has continued to improve its capital position and is now much stronger than prior to the global financial crisis (**Chart B.1**) — see Box 2 for further information on the improvement in UK banking sector resilience since the crisis.

The aggregate Tier 1 capital ratio of the major UK banks was 17% of risk-weighted assets (RWAs) in March 2018. This is an increase of 30 basis points since the November *Report*, when the results of the 2017 stress test showed the UK banking system to be capitalised to support the real economy in a severe macroeconomic stress.

On a non risk-weighted basis, banks' leverage ratios have also improved in recent years. In 2018 Q1, the major UK banks' aggregate Tier 1 capital as a proportion of total exposures, excluding central bank reserves, was 5.4% — roughly double what it was in 2007 when estimated on a consistent basis.(1)

Smaller banks and building societies — which play an increasingly important role in lending to UK households and business — are also well capitalised overall, with the 25 largest such lenders together reporting an aggregate Tier 1 capital ratio of 17% and a leverage ratio (including central bank reserves) of 5.9%.(2)

(1) This is the aggregate UK leverage ratio as an average over Q1; at the end of March the aggregate UK leverage ratio was 5.5%.
(2) Smaller firms are the next 25 largest banks and building societies, by assets, beyond the major UK banks, as of 2017 Q4.

The Bank's 2018 concurrent stress test — details of which were set out in March 2018 — will again assess participating banks' resilience to deep simultaneous recessions in the UK and global economies. The results will be published in December 2018.(3)

A number of global reforms affecting banks' capital resources have been finalised and implemented.

In December 2017, the Basel Committee on Banking Supervision finalised a package of reforms designed to complete the post-crisis reforms to bank capital requirements. This contains measures designed primarily to tackle unwarranted variability in risk weights that can arise from banks using their own models, and also a finalised global leverage ratio standard for internationally active banks (see Box 3).

January 2018 saw the introduction of a new accounting standard — International Financial Reporting Standard 9 (IFRS 9). The new approach aims to address concerns that during the financial crisis credit losses were not recognised and provisioned for early enough, and its introduction should support financial stability. The FPC has welcomed IFRS 9 and noted that the increased provisions banks will be required to hold in stress will increase their loss absorbency. It also means banks' capital ratios are likely to fall more sharply than they did in previous stress tests. The Bank has announced its intention to adjust banks' hurdle rates in the 2018 stress test to take account of this. The Bank will assess participating banks' results on the basis of the transitional capital arrangements that are in place, but intends to publish the results of the 2018 stress test both with and without these transitional arrangements.

Since the global financial crisis, banks' funding costs have fallen as their resilience has improved.

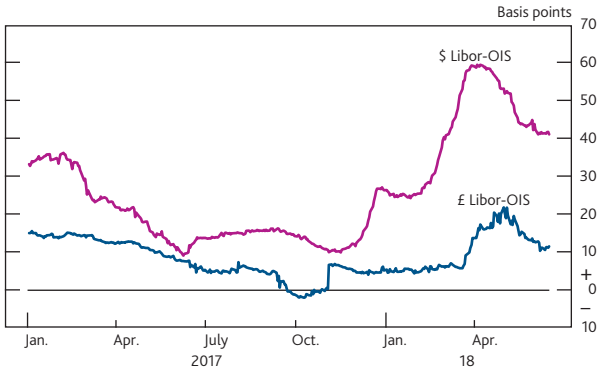
The cost at which banks borrow money in order to finance their activities can have implications for financial stability. During the financial crisis, for example, investors demanded higher compensation for higher perceived risks associated with lending to banks. As a result, the 'spread' banks paid to borrow over a 'risk free' rate rose significantly. As well as a signal of the market's assessment of a bank's riskiness, a rise in funding costs can weigh on bank profitability and erode banks' capital.

In the years following the financial crisis, funding spreads narrowed as banks repaired their balance sheets and became more resilient. Central bank policies also helped to improve

(3) In March 2018, the FPC and the PRC stated that they are minded to include the ring-fenced bank subgroups of the existing stress-test participants separately in the annual stress test from 2020. This constitutes a change to the Bank's stress-testing approach as set out in 'The Bank of England's approach to stress testing the UK banking system' published in 2015. The *Approach Document* was originally due to cover the three stress tests from 2016–18. The Bank intends to maintain the broad approach for the 2019 stress test, but will communicate any further changes to its approach in due course. Separately, the Bank's Independent Evaluation Office (IEO) will be conducting an evaluation of the Bank's stress-testing approach in 2018. The Bank intends to publish a new *Approach Document* in 2019 to cover the stress tests from 2020, taking the IEO's findings into account.

Chart B.2 UK banks' short-dated funding spreads have widened slightly since November

Three-month USD and GBP Libor-OIS rate, January 2017–June 2018[a]

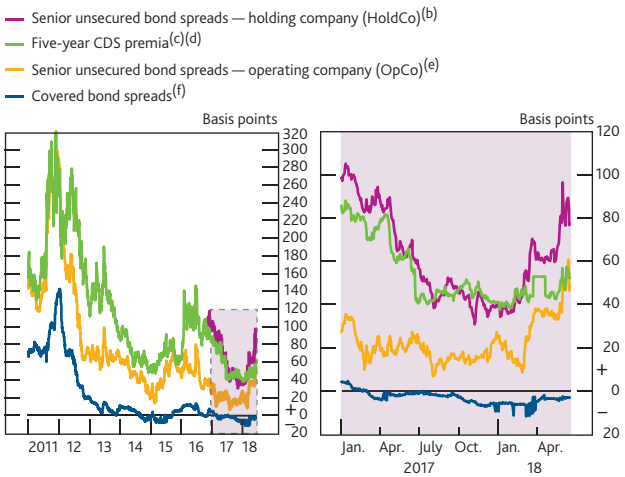


Sources: Bloomberg Finance L.P. and Bank calculations.

(a) The rate is an average derived from the quotations provided by the banks determined by the ICE Benchmark Administration. The top and bottom quartile is eliminated and an average of the remaining quotations calculated to arrive at fixing.

Chart B.3 UK banks' wholesale unsecured funding spreads have increased in recent months

UK banks' indicative long-term funding spreads[a]



Sources: Bloomberg Finance L.P., IHS Markit 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 the major UK lenders' five-year euro-denominated senior unsecured bonds issued by the holding company or a suitable proxy when unavailable.
(c) Unweighted average of five-year euro-denominated senior CDS premia for the major UK lenders.
(d) A period of low liquidity from 23 March–19 April 2018 meant CDS spreads for UK banks were held constant during this period.
(e) Constant-maturity unweighted average of secondary market spreads to mid-swaps for the major UK lenders' five-year euro-denominated senior unsecured bonds issued by the operating company or a suitable proxy when unavailable.
(f) Constant-maturity unweighted average of secondary market spreads to swaps for the major UK lenders' five-year euro-denominated covered bonds or a suitable proxy when unavailable.

funding conditions over this period and, since mid-2016, a rise in global risk appetite and the stronger outlook for activity have seen investors more willing to provide funding for banks, which helped drive spreads narrower still.

The recent modest increase in funding costs does not reflect reduced resilience in the sector…

Despite this longer-term downward trend in funding costs, there has been a slight widening in the spreads banks pay for both short and longer-term funding in recent months (**Charts B.2** and **B.3**), reflecting a shift in the balance of supply and demand for bank debt as well as changes in investor appetite for corporate debt more generally (see Global debt market conditions chapter).

In early 2018, for example, the spread banks pay to borrow from each other on a short-term basis increased sharply — especially in US dollars where the gap between the three-month USD Libor (a measure of short-term bank funding costs) and the overnight index swap (OIS) rate (the market-implied path for interest rates) widened to 59 basis points — its highest level since 2009. Spreads in both dollar and sterling short-term markets have narrowed somewhat since April (**Chart B.2**).

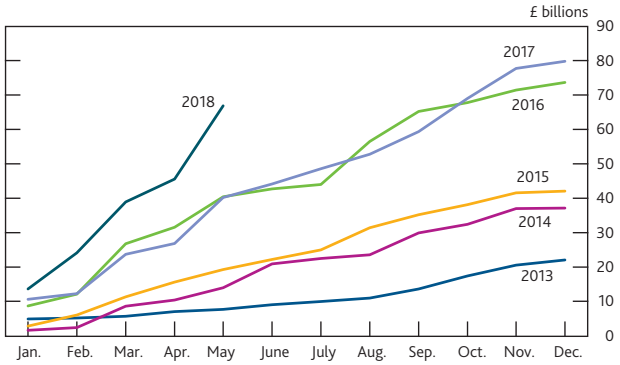
However, on this occasion, the increase in funding costs is not judged to reflect an increase in banks' riskiness. Major UK banks' five-year credit default swap (CDS) premia — which measure the cost of insuring against bank default — have remained stable and close to their post-crisis lows (**Chart B.3**).

Instead, market contacts cite a number of factors that have driven recent moves in both short and longer-term funding spreads. The rise in short-term US dollar funding costs is most closely associated with an increase in debt issuance by the US government. This has reduced the price of this debt and put upward pressure on rates across the board as a result. And recent US corporate tax reform is thought to have reduced demand for bank debt as US companies instead prepare to repatriate assets.

A key driver of the widening in longer-term spreads is a pickup in the pace and scale of term debt issuance by UK banks. At the end of May 2018, total issuance of term debt — that is loans with a specified repayment schedule and due to mature in at least one month — was more than 60% higher than at the equivalent point in 2016 and 2017 (**Chart B.4**). This higher issuance has probably been driven by a number of developments. Speculation around the potential closure of the ECB's corporate bond purchase programme later in 2018 has also led a number of market participants to bring forward issuance plans. In addition, banks are continuing to issue the debt required to meet their 'minimum requirements for own funds and eligible liabilities' (MRELs), which will help ensure they can be resolved without taxpayers footing the bill. And

Chart B.4 So far in 2018, term debt issuance by UK banks is higher than in previous years

Cumulative debt issuance by major UK banks[a][b]

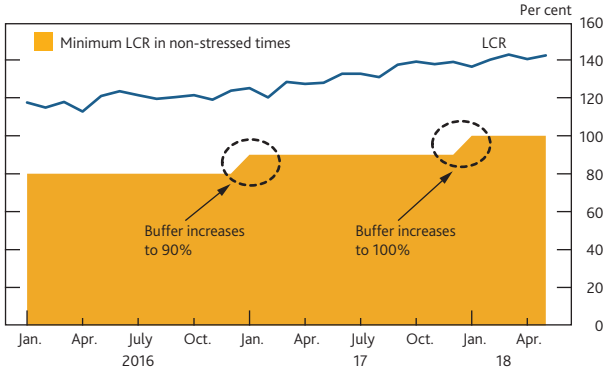


Sources: Bloomberg Finance L.P. and Bank calculations.

(a) UK banks are Barclays, HSBC, Lloyds Banking Group, Nationwide, RBS, Santander UK and Standard Chartered.
(b) Minimum term of the issued debt instruments is 0.1 years; the average term is 8.2 years.

Chart B.5 UK banks hold sufficient high-quality liquid assets to meet their net liquidity outflows as measured by the Liquidity Coverage Ratio (LCR) standard

Major UK banks' Liquidity Coverage Ratios[a][b]

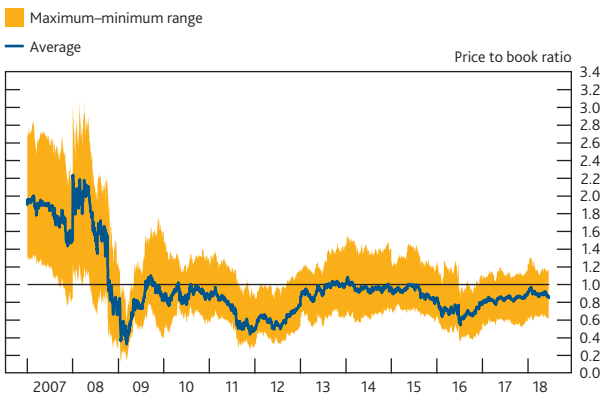


Sources: PRA regulatory returns and Bank calculations.

(a) Major UK banks are Barclays, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK.
(b) A ratio of a bank's stock of high-quality liquid assets over its total net liquidity outflows, calculated over a 30-day period.

Chart B.6 Price to book ratios have been improving

UK banks' average price to book ratio[a][b][c][d]



Sources: Bloomberg Finance L.P., Thomson Reuters Datastream and Bank calculations.

(a) UK banks are Barclays, HSBC, Lloyds Banking Group and RBS.
(b) Relates the share price with the book, or accounting, value of shareholders' equity per share.
(c) HSBC's price to book ratio is adjusted for currency movements.
(d) The underlying data have been sourced from Thomson Reuters Datastream up to 2013, and from Bloomberg from 2014 onwards.

the closure of facilities like the Funding for Lending Scheme and the Term Funding Scheme has meant banks have sought alternative sources of market funding — including through secured instruments like asset-backed securities and covered bonds.

More recently, political developments in Italy (see Other global vulnerabilities chapter) have contributed to a general increase in funding costs across Europe. These developments have also occurred alongside a slight widening of spreads in credit markets more generally (see Global debt market conditions chapter) — suggesting that increases in funding costs are not a specific comment on the strength of the UK banking sector.

…and UK banks' liquidity positions remain strong.

UK banks' liquidity and funding positions — which have improved significantly over the past decade — remain strong. Before the financial crisis, the combination of major UK banks' own liquidity resources and their access to central bank facilities covered just 10% of their short-term liabilities prone to risk. Today that figure is over 100%. Major UK banks and smaller UK domestic banks also hold sufficient high-quality liquid assets to meet the Liquidity Coverage Ratio buffer (designed to address short-term acute liquidity stress) plus any supervisory add-ons for any risks not captured or not fully captured by this buffer requirement (**Chart B.5**). All major UK banks also report they have sufficient stable funding to meet the proposed Net Stable Funding Ratio (NSFR) requirement, which is designed to reduce funding risk in the event of a slower-burn stress.

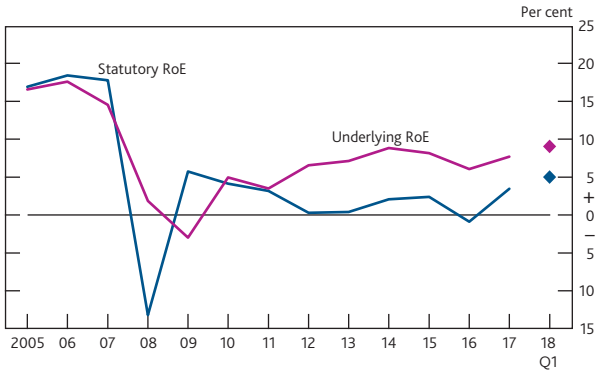
The outlook for UK banks' profitability has improved a little — but potential headwinds remain.

A bank's price to book ratio compares the market value of shareholders' equity in the bank with the accounting, or 'book', value of that equity. UK banks' price to book ratios have been improving since their mid-2016 trough and now average around 0.9 — marginally higher than at the time of the November *Report* (**Chart B.6**).

Previously, the FPC has judged that UK banks' low equity prices could probably be explained by market concerns over expected future profitability rather than by concerns about asset quality. Similarly, the improvement in price to book ratios since 2016 is in line with an improved outlook for bank profitability, as reflected in major UK banks' latest financial results. In aggregate, the biggest UK banks reported underlying return on equity (RoE) — a measure of profitability relative to equity that strips out misconduct costs and one-time charges such as restructuring costs — of 7.7% in 2017 (**Chart B.7**). This was an improvement on the previous year, primarily driven by income rising against a falling cost base and the benign credit environment that saw impairments fall relative to 2016. Statutory RoE — that is RoE that is actually achieved — has

Chart B.7 Banks are reporting higher profits — but headwinds persist

Major UK banks' statutory and underlying return on equity(a)(b)(c)(d)

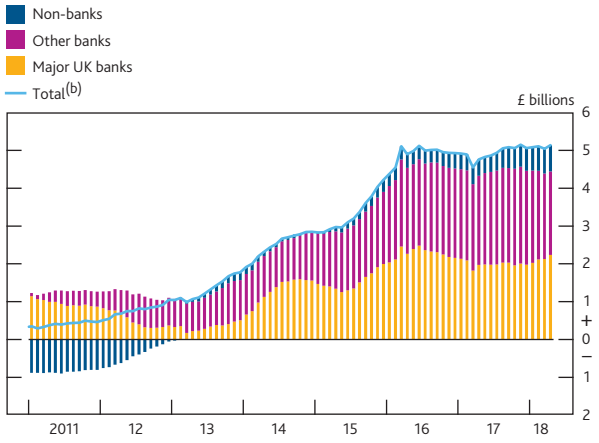


Sources: Published accounts and Bank calculations.

(a) Weighted average by shareholders' equity.
(b) Statutory RoE is defined as net income attributable to shareholders divided by average shareholders' equity. Underlying RoE strips out misconduct costs as well as one-time charges such as restructuring costs.
(c) Major UK banks are Barclays, HSBC, Lloyds Banking Group and RBS.
(d) Diamonds show annualised quarterly results for 2018 Q1 and are not directly comparable to full-year results.

Chart B.8 Smaller banks are accounting for a larger share of new lending to UK households

Net lending to the household sector by lender type(a)



Sources: Bank of England and Bank calculations.

(a) Calculated as the 12-month moving average of the net flow of lending to households.
(b) Total net lending will differ from banks' published accounts due to the exclusion of technical allocations.

also increased over the past year. This has helped banks improve their capital ratios through retained profits. As a result, most major UK banks are now at, or close to, their publicly stated capital ratio targets and have policies in place to redistribute capital to shareholders.

However, a number of challenges to profitability are likely to persist. Despite a relatively benign outturn in 2017, costs relating to past misconduct are still likely to affect banks' reported profitability in coming years. UK investment banking revenues also remain subdued, reflecting in part a return to low levels of financial market volatility following the spike in February.

Competitive pressures have been increasing in some areas.
Strong price competition in the mortgage market (see UK household indebtedness chapter) is pushing down on the margins between rates at which banks lend and the interest rates they pay to obtain deposits and other sources of funding. A more competitive banking sector can bring benefits to consumers and businesses, but may have implications for incumbent banks' resilience because it affects their capacity to generate income that can replenish capital when they incur losses on their lending. Evidence suggests that larger UK banks are competing most aggressively on price in the mortgage market. But smaller banks are also playing an important role in net new lending to households overall (**Chart B.8**). In the 12 months to end-April, smaller banks — that account for around a fifth of the outstanding stock of household lending — have delivered over 40% of the new lending to UK households.

Reforms aimed at facilitating competition and transparency within the banking sector are yet to have a material impact.
The revised EU Payment Services Directive and the Competition and Markets Authority's 'Open Banking' reform were introduced in January 2018. These reforms aim to enhance competition and transparency, including by requiring banks to give regulated third parties access to customer accounts data, subject to customer permission.

While these reforms could improve competition and innovation in the market for financial services they also pose a number of potential challenges for banks. In particular, profitability may be squeezed if competitive pressures intensify and there could be implications for liquidity risk if customers choose to transfer deposits between accounts more frequently. A number of these risks were explored as part of the Bank's 2017 biennial exploratory scenario.

Banks are making progress towards becoming compliant with the requirement to release personal account data. But take-up of these reforms has been muted so far and public awareness of the reforms appears to be low. The FPC and other relevant authorities will continue to monitor developments in this area.

Box 1
The FPC's tolerance for the disruption of financial services from cyber incidents

Financial stability is the consistent supply of the vital services that the real economy demands from the financial system. A severe operational incident, such as an IT failure or a cyber incident, can impair processes and data supporting these services, and therefore put financial stability at risk.

The FPC set out the elements of the framework of regulation to strengthen the resilience of the UK financial system to cyber risk in the June 2017 *Report*:

(i) clear baseline expectations for firms' resilience that reflect their importance for the financial system;
(ii) regular testing of resilience by firms and supervisors;
(iii) identification of firms that are outside the financial regulatory perimeter, but which may be important for regulated firms; and
(iv) clear and tested arrangements to respond to cyber attacks when they occur.

This box sets out how the FPC plans to address points (i) setting clear expectations, and (ii) testing firms.

Effective resilience requires firms to be able to: prevent material incidents from occurring; continue to provide services and functions in the event of an incident; prevent an increase in the level of fraud during an incident; return to normal operations promptly when the incident is over; and learn from incidents, in order to limit the chances of them happening again in future.

Firms have primary responsibility for their ability to resist and recover from cyber incidents. The supervisory authorities expect boards to take responsibility for the cyber resilience of their firms. For example, within the PRA's Senior Managers and Certification Regime, the Chief Operations Senior Managers Function has responsibility for the internal operations and technology of a firm, including cyber security. **To guide firms in their planning, the FPC is establishing its tolerance for the length of any period of disruption to the delivery of vital services the financial system provides to the economy. That time frame is the FPC's 'impact tolerance'**.

The services on which the FPC is focused are:

- providing the main mechanism for paying for goods, services and financial assets (hereafter, 'payments');
- intermediating between savers and borrowers, and channelling savings into investment, via debt and equity instruments; and
- insuring against and dispersing risk.

Consistent with the FPC's responsibility to mitigate systemic risk, it will set a tolerance at the point after which it judges disruption would begin to cause material economic impact.

For example, disruption to one bank's payments could have a direct impact on the real economy by impacting the ability of customers of that bank to pay for goods and services. But a severe disruption to one bank's ability to make payments may also have an impact on other firms initially unaffected by the incident which could impair interbank lending and, in turn, activities such as clearing, settlement or mortgage payments.

Likewise, disruption to derivatives trading could affect firms' ability to insure themselves against financial risk. A severe disruption could have market confidence effects if participants lost confidence in an institution or economic activity, and could also increase the risk of default of a major market participant. It could also create market uncertainty and affect market liquidity.

Working with others, especially the National Cyber Security Centre, the Bank will test that firms would be able to meet the FPC's standards for recovering services.

The FPC recognises that firms would not be able to meet its tolerances in the most extreme circumstances. Doing so would make the effective provision of financial services inefficient. The FPC intends to calibrate its stress-testing scenarios to be severe but plausible.

In stress tests of financial resilience, the FPC is able to use past macroeconomic data to calibrate a severe but plausible macroeconomic shock. No such history exists for cyber events. So the FPC will rely on the independent judgement of experts, such as the National Cyber Security Centre, to assist calibration of the stress scenarios, drawing on up-to-date intelligence.

Firms undertaking this stress testing will need to demonstrate their ability to meet the FPC's impact tolerance. In instances where that cannot be shown, remedial action plans will be agreed with supervisors.

The FPC will work with other regulators to establish which firms would be in scope of stress testing. The scope is likely to vary, depending on the vital service that is being tested, and will take into account firms' contribution to the function (measured by value, volume and/or market share), and interconnectedness.

This stress-testing approach will be developed by the Bank and the PRA, with input from the FPC. The particular incident modelled, the firms in scope, and the economic activities tested will likely vary from test to test.

The Bank plans to launch a pilot of the approach to stress testing in 2019, which will focus on payments. The Bank and the PRA will work with firms to develop the pilot approach. Further details will be published in 2018 Q4.

Cyber risks are one example of operational incidents that could have a significant impact on firms' ability to provide vital services. The FPC focuses on these risks, as cyber incidents are most likely to be part of a system-wide threat. In the Bank's latest *Systemic Risk Survey*, published alongside the *Financial Stability Report*, 62% of respondents cited it as a key source of risk, up from 51% a year ago.

While they did not have systemic consequences, recent episodes of disruption to customers using the Visa payment system and of TSB bank highlighted the importance of operational risk beyond cyber incidents for individual firms and consumer protection. They will therefore inform further work of firm-level supervisors in this area. The authorities' broader approach to operational resilience, including cyber risk, will be discussed in an upcoming joint FCA, Bank and PRA Discussion Paper.

Box 2
The improvement in UK banking sector resilience since the financial crisis

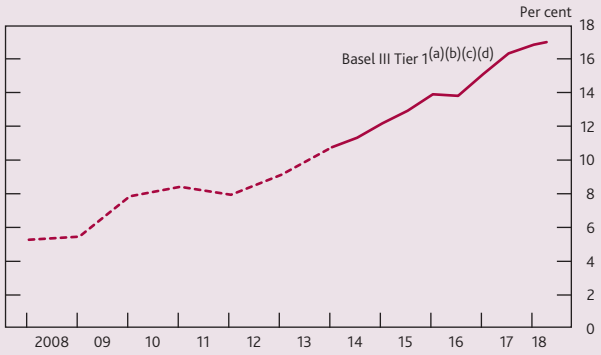
September 2018 marks 10 years since the collapse of Lehman Brothers and the global financial crisis that followed. The crisis highlighted significant weaknesses in the UK and global banking systems, with severe consequences for households and businesses. A priority for global and UK authorities — including the Bank of England — over the past decade has been to strengthen bank resilience to ensure the system could withstand losses of a similar magnitude in the future.

UK banks' capital and liquidity positions have strengthened since the financial crisis.

In aggregate, on a Tier 1 capital ratio basis, the major UK banks are estimated to be three times stronger than they were at the end of 2007 (**Chart A**).

Chart A UK banks have significantly strengthened their capital positions since the global financial crisis

Major UK banks' Tier 1 capital ratio



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

(a) Weighted by risk-weighted assets.
(b) From 2014, the 'Basel III Tier 1 capital ratio' is calculated as Tier 1 capital over risk-weighted assets. The CET1 element within Tier 1 and RWAs are according to the CRD IV definition as implemented in the United Kingdom. The additional Tier 1 element within Tier 1 excludes grandfathered instruments and other transitional adjustments. Prior to 2014, the chart shows Bank estimates; preference shares are used as a proxy for additional Tier 1 capital. The peer group includes Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK.
(c) From 2018, Basel III Tier 1 capital ratios reflect IFRS 9 transitional arrangements as agreed in European law.
(d) Series begins at end-2007.

The level of capital banks are *required* to hold has also increased significantly. Indeed, the amount of common equity Tier 1 (CET1) capital that global systemically important banks now have to hold relative to their risk-weighted assets, via their minimum capital requirements and various buffers, has increased tenfold since the financial crisis.(1)

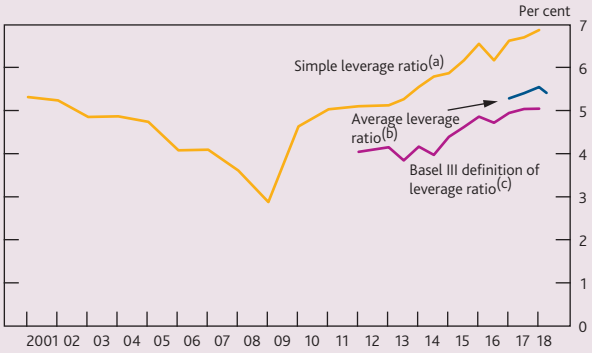
This change in requirements has meant that the weakest banks before the financial crisis have strengthened their position by more than the average. The Royal Bank of Scotland, for example, has increased its CET1 capital ratio from an estimated 1.97%(2) at end-2007 to 16.4% in 2018 Q1.

The improvement in banks' risk-weighted capital ratios reflects both an increase in capital resources as well as a reduction in the size and riskiness of banks' balances sheets. The major UK banks have around £250 billion of Tier 1 capital, which is estimated to have increased by just over £100 billion since 2007. Risk-weighted assets have fallen by around £1.3 trillion over the same period, driving much of the increase in banks' Tier 1 capital ratios. In recent years, much of this improvement has reflected how banks have scaled back their investment banking activities and disposed of non-core businesses, such as some overseas subsidiaries.

The leverage ratio is invariant to changes in the riskiness of assets. The simple leverage ratio of the major UK banks has roughly doubled since 2007 (**Chart B**). Estimated on a consistent basis, the average leverage ratio of the major UK banks has also roughly doubled since 2007.

Chart B UK banks' leverage ratios have also strengthened

Major UK banks' leverage ratios



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

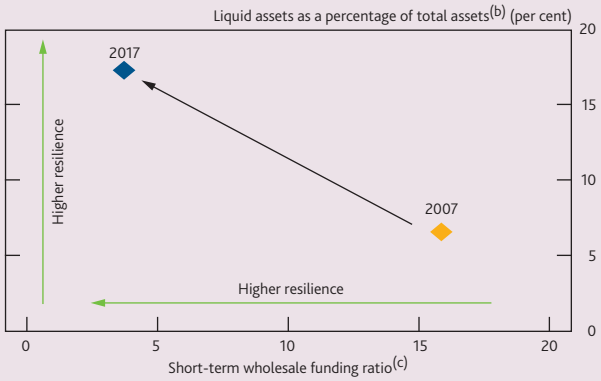
(a) Simple leverage ratio is defined as the ratio of shareholders' claims to total assets based on banks' published accounts (note a discontinuity due to introduction of IFRS accounting standards in 2005, which tends to reduce leverage ratios thereafter). The peer group described in footnote (o) in Annex 2 also applies here.
(b) Leverage ratio with central bank reserves excluded from the exposure measure. The peer group used in footnote (b) to **Chart B.1** also applies here. From 2018, the ratio reflects IFRS 9 transitional arrangements as agreed in European law.
(c) The Basel III leverage ratio corresponds to aggregate Tier 1 capital over the 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. The exposure measure is based on the Basel 2014 definition for 2014 and the CRR definition from 2015 onwards.

There has also been a shift towards safer and more liquid assets, partly driven by changing liquidity requirements. As a result, UK banks' liquidity positions are also significantly better than they were before the crisis. At the end of 2017, liquid assets, such as cash, balances with central banks and government bonds, accounted for 17.2% of large banks' total assets — more than double its low level in 2007. In addition, banks' reliance on short-term funding (excluding repo financing(3)) has fallen substantially since the crisis. At

(1) See Caruana, J (2012), 'Enhancing financial stability — issues and challenges', February, www.bis.org/speeches/sp120208.pdf.
(2) See Financial Services Authority Board Report (2011), 'The failure of the Royal Bank of Scotland', December.
(3) Share of total funding (including capital) accounted for by wholesale funding with residual maturity of under three months other than repo funding (repurchase agreements and securities lending).

Chart C UK banks' liquidity and funding positions have improved since 2007

Liquid assets and short-term funding of large UK banks[a]



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

(a) Sample includes Barclays, HSBC, Lloyds Banking Group (including HBOS in 2007), Nationwide and RBS.
(b) The estimate of liquid assets in 2007 is based on: cash and balances with central banks; and highly liquid securities. Liquid assets in 2017 comprise LCR Level 1 high-quality liquid assets excluding covered bonds.
(c) Share of total funding (including capital) accounted for by wholesale funding with residual maturity of under three months other than repo funding. Wholesale funding comprises deposits by banks, debt securities and subordinated liabilities. Funding is proxied by total liabilities excluding derivatives and liabilities to customers under investment contracts. Estimates have been used in the underlying data where published data is not available.

end-2017 it accounted for just 3.8% of large UK banks' total funding compared to 15.9% in 2007 (**Chart C**).

The introduction of the Net Stable Funding Ratio will also help limit overreliance on short-term wholesale funding in the event of a long-term slow-burn stress.(4)

Banks have also become less dependent on one another — a development that reduces the likelihood that problems in a small number of banks can spread throughout the rest of the banking system. At the global level, interconnectedness between banks and other financial intermediaries (such as investment funds) has fallen in recent years.

The stress-test results show the system to be more resilient.

The improved resilience of the UK banking system is evident in the results of the Bank's annual stress test, the annual cyclical scenario (ACS). The 2017 ACS assessed the major UK banks against a stress more severe than the financial crisis. In the test, despite incurring losses of around £50 billion in the first two years of the stress, banks' capital buffers were sufficient to enable them to maintain lending to UK households and businesses. The stress test showed these losses could now be absorbed within the buffers of capital those banks have on top of their minimum requirements. The stress test resulted in a fall of more than 5 percentage points in banks' aggregate CET1 ratios; a similar fall in banks' capital ratios would have wiped out the common equity capital base of the UK banking system in 2007.

Unlike in 2007, the current UK resolution regime means taxpayers should not bear the costs of failure in future…

In the event that a bank does fail, reforms have been introduced aimed at ensuring shareholders and creditors of the failed bank — rather than taxpayers — bear the losses. For larger banks, this 'minimum requirement for own funds and eligible liabilities' (MREL) helps to ensure that if a bank were to fail, the resolution authority can use that bank's own financial resources to absorb losses and recapitalise the business, so that it can continue to provide critical functions without the need to rely upon public funds.

The Bank calibrates MREL as the sum of a loss-absorption amount, equal to a bank's minimum capital requirements, and a recapitalisation amount. In aggregate, the largest UK banks already hold loss-absorbency resources of 25% of their RWAs against a 2022 requirement of 29%. As of end-2017, this gap as a percentage of RWAs is equivalent to £58 billion.(5)

…the introduction of ring-fencing will help protect the provision of core banking services…

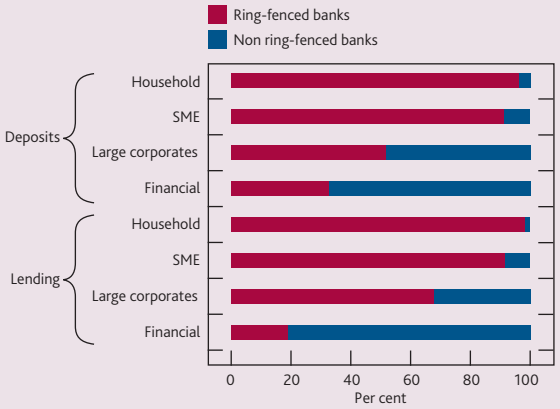
The financial crisis also revealed the need for fundamental changes to how banks are structured and run. New requirements taking effect from January 2019 will require UK banks with more than £25 billion of deposits from households and businesses to separate the provision of core services(6) from other activities within their groups, such as investment banking. These requirements are known as structural reform or 'ring-fencing'. The major UK banks are most affected by ring-fencing given the diversity of their activities, but some large UK-focused challenger banks must also meet the new requirements.(7)

Ring-fenced banks will provide the bulk of UK retail banking services and will be kept separate from other parts of the banking group. Within the major UK banking groups, virtually all lending to UK households and almost three quarters of lending to businesses will be provided by ring-fenced banks. Almost all (96%) of household deposits are expected to sit within their ring-fenced banks as well as just over 70% of business deposits (**Chart D**). This new structure means that provision of these essential banking services to the UK real economy will be protected from shocks originating outside the

(4) The NSFR will require banks to maintain a stable funding profile in relation to the composition of their assets and off balance sheet activities. The European Commission has proposed implementing the NSFR as part of the Capital Requirements Regulation II legislative package which is currently being discussed by EU legislative bodies. In the Commission's proposal, the NSFR would become a requirement two years after the entry into force of the regulation.
(5) Figures are based on end-2017 resources, risk-weighted assets and exchange rates, and the MRELs published by the Bank on 13 June 2018. Figures conservatively assume, in line with the total loss-absorbing capacity standard, that regulatory capital issued by subsidiaries of resolution entities is not counted to MREL.
(6) Core services are defined in the legislation as making and receiving payments, deposit-taking and providing overdrafts.
(7) The major UK banks are Barclays, HSBC, Lloyds Banking Group, RBS and Santander UK. The affected challenger banks are Clydesdale, TSB and Virgin Money.

Chart D Ring-fenced banks will better protect core retail services

Split of funding and lending for the major UK banks following the introduction of structural reform[a][b]



Sources: PRA regulatory returns — EBA Funding Projections Exercise and Bank calculations.

(a) Sample includes Barclays, HSBC, Lloyds Banking Group, RBS and Santander UK.
(b) Data cover lending and deposit-taking in UK and European operations, including the Channel Islands and Isle of Man.

ring-fence, whether that be elsewhere in the banking group or in global financial markets.

Reflecting their importance to the real economy, the ring-fenced banks will be subject to higher capital requirements, in the form of the systemic risk buffer. This recognises that these institutions are systemically important to the domestic financial system and means that, based on their estimated size, they will have, on average, around 1.5 percentage points more Tier 1 capital than non-systemically important banks.

…and senior bankers are now more accountable for their actions. Another lesson of the financial crisis was that too often senior staff in failing banks were able to deny responsibility for decisions taken within the firm. The Senior Managers and Certification Regime, which came into force in 2016, is aimed at ensuring firms clearly allocate responsibilities to their most senior managers so they can be better held to account. Senior Managers are subject to a statutory duty of responsibility that allows the PRA and FCA to hold them to account for misconduct if a regulatory breach takes place and it can be demonstrated that they failed to take reasonable steps to prevent or stop it. Furthermore, remuneration rules now better align incentives and rewards to discourage excessive risk-taking and misconduct. For example, new rules mean that senior managers face clawback of bonuses for up to seven years, and in some circumstances ten years, after they were awarded if misconduct comes to light.

The FPC, working with supervisory authorities, will continue to take appropriate action to maintain sufficient levels of resilience in the system.

Box 3
UK and international leverage ratio frameworks

In 2015, the FPC set out a leverage ratio framework for global systemically important institutions (G-SIIs) and other major domestic UK banks and building societies, ahead of an international standard on leverage being agreed and implemented. That decision reflected the number of systemically important banks in the UK; the size of the UK banking system; and the importance, therefore, of being able to manage effectively model risk and to respond consistently to risks to financial stability.(1)

On 7 December 2017, the Group of Central Bank Governors and Heads of Supervision finalised a package of reforms (known as 'Basel III') to strengthen confidence in banks' capital ratios. The package included a finalised global leverage ratio standard for internationally active banks.(2)

This box compares the Basel III and current UK leverage ratio frameworks, and updates on the FPC's review of its framework in light of international developments.

Basel III leverage ratio

In addition to the already agreed 3% Tier 1 minimum leverage ratio to be applied from 2018, the finalised standard includes:(3)

- A Tier 1 leverage ratio buffer for G-SIIs, set at 50% of the G-SII's risk-weighted buffer, to be implemented from 2022.
- A number of revisions to the calculation of the denominator of the leverage ratio — the 'exposure measure' — to be implemented from 2022.(4)

Comparison to the FPC leverage ratio framework

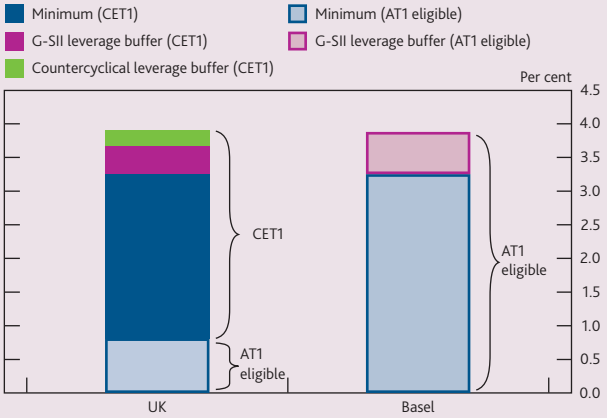
The finalised Basel III leverage ratio is similar to the FPC's framework, although there are some differences (**Table 1**).

Overall, the finalised Basel III leverage ratio and the current UK framework require the seven major UK banks to hold broadly similar levels of Tier 1 capital. The FPC framework requires that UK banks meet the majority of their leverage ratio requirements and buffers with the highest-quality capital, common equity Tier 1 (CET1) (Chart A). In contrast the Basel III leverage ratio can be met entirely with any form of Tier 1 capital.

Buffers

The Basel III leverage ratio framework sets a buffer for G-SIIs calibrated to 50% of the corresponding risk-weighted buffer rate. The FPC framework has a lower leverage ratio buffer scalar for G-SIIs, set at 35%, to preserve a relationship between the ratio of minimum leverage requirements to risk-weighted requirements.

Chart A Basel III versus current UK leverage ratio stylised requirements(a)(b)



Sources: Published accounts, Pillar III disclosures and Bank calculations.

(a) Current UK framework assuming fully phased in buffers compared to expected Basel III requirements (2022). Calculated using UK quarterly average leverage exposure measure as at 2018 Q1. UK G-SII leverage ratio buffer and countercyclical leverage ratio buffers (CCLB) set at 35% of corresponding risk-weighted G-SII buffer and countercyclical capital buffer (CCyB) rates. Assumes a 1% UK CCyB rate. Basel G-SII buffer set at 50% of risk-weighted G-SII buffer. Peer group used for both stacks consists of Barclays, HSBC, Lloyds Banking Group, Nationwide, RBS, Santander UK and Standard Chartered.
(b) Both stacks exclude central bank (CB) reserves and the minimum leverage requirement is shown as 3.25% so they are comparable. This is in line with the national discretion to exclude CB reserves conditional to recalibrating the minimum to maintain resilience.

The FPC's framework has an additional buffer, the countercyclical leverage buffer (CCLB), to maintain resilience against systemic risks that vary through time.

Unlike Basel, the FPC's leverage ratio buffers are not subject to automatic constraints on capital distributions. This supports buffers being usable in a stress.

Quality of capital

While the Basel III leverage ratio standard can be met entirely using Tier 1 capital, the UK framework limits the share of additional Tier 1 (AT1) instruments eligible to meet the UK minimum leverage ratio requirement to 25% and requires that all leverage ratio buffers be met with CET1. This mirrors the risk-weighted framework and ensures that banks use the highest quality of capital, CET1, to meet the majority of their leverage ratio requirements.

In addition, only high-trigger AT1 instruments (ie those that trigger at a ratio of at least 7% CET1) can be used to meet requirements in the UK leverage ratio framework. The higher

(1) See The Financial Policy Committee's powers over leverage ratio tools.
(2) Press statement.
(3) The Basel Committee introduced a leverage ratio into the capital framework in December 2010, further developing it in January 2014. The minimum leverage ratio was confirmed in January 2016: www.bis.org/press/p160111.htm.
(4) See pages 9–10 in High-level summary of Basel III reforms.

trigger provides greater assurance that losses could be absorbed while a firm is a going concern.

Exposure measure

The FPC leverage ratio framework adopts the 2014 Basel Committee on Banking Supervision (BCBS) exposure measure definition, as implemented by European law, and modified to exclude claims on central banks.

The finalised Basel III package revised the exposure measure agreed in 2014. The revisions include:

- allowing netting of cash receivables and cash payables from unsettled sales of securities; and
- allowing national authorities to exempt central bank reserves, providing they recalibrate the minimum leverage ratio requirement to maintain resilience. This is consistent with the PRA's implementation in October 2017 of an FPC Recommendation to exempt central bank reserves from the UK leverage exposure measure and recalibrate the minimum leverage ratio requirement to 3.25%.(5)

The BCBS has also set out that it will continue to monitor the impact of the leverage ratio on securities financing transactions markets and market liquidity, and the treatment of client-cleared derivative transactions (including the treatment of initial margin).(6)(7)

Table 1 Key differences between Basel III and the current UK framework

	Finalised Basel III	Current UK framework
Buffers	G-SII buffer scaled at 50% of risk-weighted buffer.	G-SII buffer and CCLB, scaled at 35% of risk-weighted buffers.
	Subject to automatic distribution restrictions.	No automatic distribution restrictions.
Quality of capital	Tier 1, with no limits on AT1.	Tier 1 with at least 75% of the minimum and 100% of buffers to be met with CET1.
		Only high-trigger AT1 allowed.
Exposure measure	Netting of cash receivables and payables from securities.	Excludes CB reserves, and recalibrated minimum requirement to 3.25%.
	Allow national authorities to exclude CB reserves under certain conditions, including recalibration of minimum requirement.	

The FPC's review of the leverage ratio framework

In 2014, the FPC said it would conduct a comprehensive review of the leverage ratio framework in light of revised international standards. This includes Basel III and the European Capital Requirement Regulation (known as CRR2) currently under negotiation. In particular, this review would set out the approach to extending leverage ratio requirements and buffers to PRA-regulated firms, and to entities below the consolidated group level.(8)

The FPC has decided that it will conduct and communicate the outcome of its review once there is further clarity on the finalised implementation of the leverage ratio requirement in EU law and how it might affect UK firms.

In the meantime, the FPC supports the PRA's plans to consult on implementing leverage ratio requirements in parallel with the introduction of risk weighted requirements for systemic ring-fenced bank subgroups and large building societies subject to a systemic risk buffer from 2019. This will include a proposal to ensure that, where systemic buffers apply at different levels of consolidation, there is sufficient capital at the group level, and distributed appropriately across it, to address both global systemic risks and domestic systemic risks.(9) The proposals are in line with Bank expectations that leverage ratio hurdle rates in the 2018 stress test of major UK banks will incorporate buffers to capture domestic systemic importance as well as global systemic importance.(10) The PRA plans to consult over summer 2018.

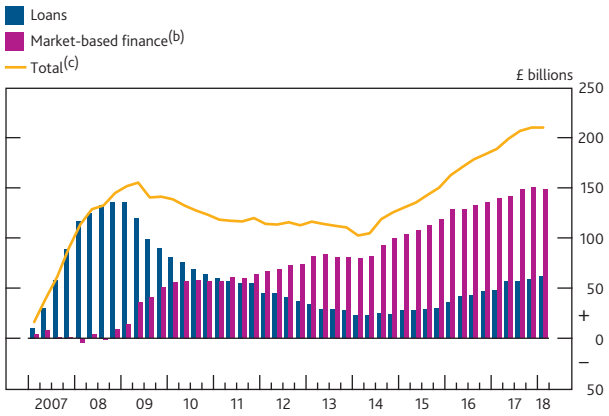
(5) See The Financial Policy Committee's powers over leverage ratio tools.
(6) A 2017 study on repo market functioning by the Committee on the Global Financial System (CGFS) concluded that these markets are in transition partly due to new regulatory standards, and should be subject to close and ongoing monitoring. See 'Repo market functioning', *CGFS Papers No. 59*.
(7) The BCBS's review of the leverage ratio impact on banks' provision of clearing services will be informed by the Financial Stability Board evaluation of the G20 reforms on incentives to clear over-the-counter derivatives centrally. This study, to be undertaken by the Derivatives Assessment Team (DAT), will be completed in late 2018. See Review of incentives to clear OTC derivatives centrally.
(8) See The Financial Policy Committee's review of the leverage ratio.
(9) See the FPC's Systemic Risk Buffer framework policy statement.
(10) See the Key Elements of the 2018 Stress Tests.

Market-based finance resilience

Market-based finance has become increasingly important to the provision of finance to UK companies. This growth has diversified the supply of finance to the real economy. In recent years, market-based finance has been reliable and well-functioning. But a number of factors could mean some forms of market-based finance may amplify market adjustment in stress. For example, markets may be vulnerable to large-scale redemptions from open-ended investment funds. And while dealers are more resilient, they may be less willing or able to act as intermediaries during periods of stress. Given these vulnerabilities, the Bank is continuing to develop a stress simulation to assess the dynamics of important markets under stress.

Chart B.9 Market-based finance is an important source of financing for UK companies

Cumulative net finance raised by UK private non-financial corporations (PNFCs) since 2007[a]



Sources: Bank of England and Bank calculations.

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

Market-based finance is important to the provision of finance to UK companies…

Market-based finance refers to the system of markets, non-bank financial institutions and infrastructure that (alongside banks) provide financial services to support the real economy. These services include intermediating between saving and investment, and the transfer of risks.

Market-based finance has become increasingly important since the crisis. In the UK, non-bank financial institutions now account for almost 50% of the UK financial system's total assets, up by 13 percentage points since 2008.

This growth has diversified the supply of finance to the real economy. It mitigated cut backs in bank credit following the global financial crisis as the core banking system repaired its balance sheet. For example, since 2007, nearly three quarters of net finance raised publicly by UK private non-financial corporations in the UK has been through the issuance of tradable securities, and most of this through corporate bond issuance (**Chart B.9**).

…and therefore its resilience is of greater consequence to the UK economy.

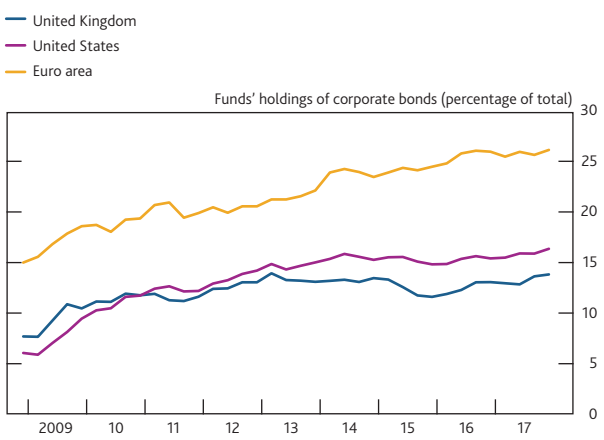
The resilience of market-based finance reflects the extent to which it can absorb, rather than amplify, shocks, and thus continue to provide vital functions to support the UK economy. This relies on the behaviour of a range of intermediaries and investors that, in combination, determine how smoothly markets function.

If financial markets lack resilience — for example, if they lack sufficient liquidity — they may amplify a market adjustment, causing a tightening in credit availability for the wider economy. In extreme cases, markets can become dysfunctional and effectively shut out access to finance.[1]

(1) For example, UK high-yield bond issuance markets were closed for four consecutive quarters during the global financial crisis of 2008–09.

Chart B.10 Open-ended investment bond funds hold a larger proportion of the corporate bond market

Open-ended investment bond funds' holdings of corporate bonds(a)

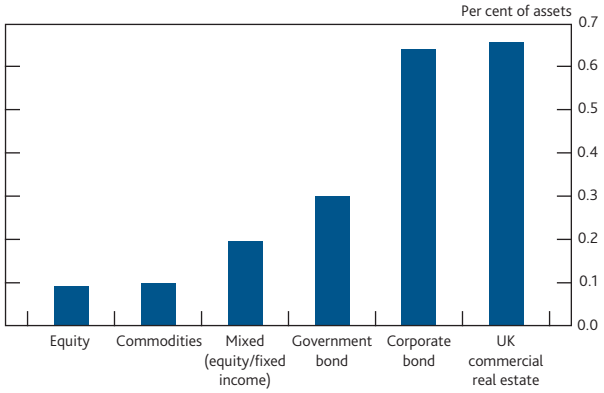


Sources: Bank of England, ECB, Federal Reserve, Morningstar, Thomson One and Bank calculations.

(a) United Kingdom: sterling corporate bond funds (open-ended and exchange-traded funds) total net assets as a share of all outstanding sterling corporate bonds. United States: mutual funds' holdings of corporate and foreign bonds as a share of all outstanding corporate and foreign bonds. Euro area: euro-area open-ended holdings of bonds issued by euro-area non-financial corporations as a share of total. All data up to 2017 Q4.

Chart B.11 Corporate bond funds see redemptions that are seven times more sensitive to price moves than equity funds

Fund redemptions following 1% fall in asset value(a)



Sources: Morningstar and Bank calculations.

(a) Procyclicality estimates reflect monthly redemptions from European open-ended investment funds in response to a 1% loss incurred over the previous month. Estimates are produced using panel regression methodology and monthly data covering 2005–15.

This risk is pertinent given the possibility of a reversal of the accommodative global financial conditions at present (see Global debt market conditions chapter). A sudden reappraisal of the outlook for interest rates or corporate earnings could, for example, lead to an adjustment in corporate bond markets that in turn could be amplified by a lack of market resilience. And while liquidity in normal times across a range of financial markets has been good in recent years, there are reasons to question how these markets may perform during stress.

The spike in some measures of equity market volatility in early February is a useful example of these potential risks. The Bank's market contacts reported that the initial shock had been amplified by financial instruments designed to provide investors with leveraged exposure or inverted exposure to the level of implied US equity market volatility, which required instrument issuers to act procyclically in response to market moves. But while some markets experienced sharp price swings and a reduction in liquidity, the effects were largely short-lived.

Movements in Italian government bond markets in late May and early June also highlight how market illiquidity can amplify market adjustments. Political uncertainty in Italy caused yields on Italian government bonds to rise sharply in May, experiencing the largest one-day move since 2000 (see Other global vulnerabilities chapter). There were also spillovers to other euro-area sovereign spreads and broader credit markets. The Bank's market contacts suggested that poor liquidity in Italian government bonds and futures markets during this episode was likely to have exacerbated the market moves,(2) although broader market functioning was more resilient.

Markets may be vulnerable to large-scale redemptions from open-ended investment funds.

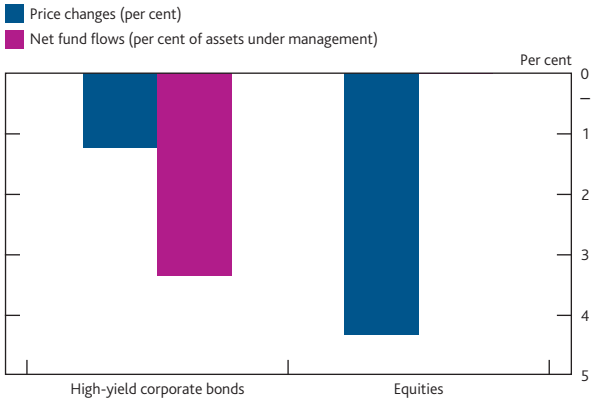
The functioning of some markets could be tested by high demand for liquidity, including from open-ended investment funds. Some of these funds offer short-term redemptions to investors while investing in longer-dated and potentially illiquid assets. Total assets managed by open-ended funds worldwide have more than doubled following the global financial crisis. And the share of corporate bonds held in open-ended funds in the UK and the euro area has increased by more than 70% since the crisis (**Chart B.10**).

There is evidence that investors in funds investing in less liquid assets can be more sensitive to asset price moves. For example, Bank staff estimate that for a 1% fall in asset prices, redemptions from funds holding corporate bonds are seven times the redemptions from equity funds and twice as large as those from sovereign bond funds (**Chart B.11**).

(2) For example, the bid-offer spreads of Italian government bonds and futures were significantly wider and more volatile for a period in late May and early June. During this period, the interdealer market also saw a material decline in trading volumes, while volumes in Italian bond futures increased.

Chart B.12 High-yield corporate bond open-ended funds experienced accelerated outflows during February, in contrast to close to zero net flows from equity funds

High-yield corporate bond and equity price changes and open-ended investment fund cumulative net flows as a percentage of assets under management in February(a)

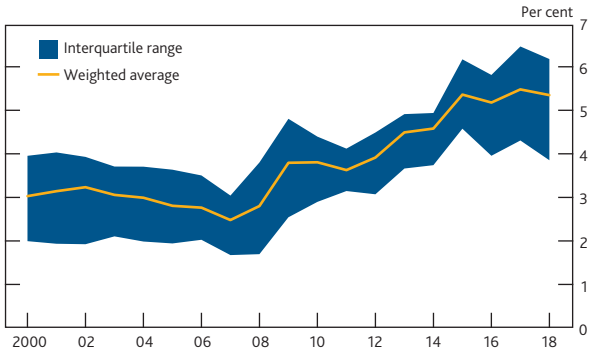


Sources: Bloomberg Finance L.P., ICE/BofAML, Morningstar and Bank calculations.

(a) High-yield corporate bonds: prices refer to developed market bonds issued in USD, GBP, EUR and CAD. Fund flows refer to sterling, euro and US dollar focused funds investing principally in high-yield corporate bonds. Equity: prices refer to the FTSE Developed All Cap index. Fund flows refer to UK, US and euro area focused funds investing principally in equities.

Chart B.13 Aggregate dealer leverage ratios remain high

Dealers' leverage ratios(a)(b)



Sources: SNL Financial, The Banker Database, 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. This accounting measure differs from regulatory leverage ratios.
(b) Dealers included are Bank of America Merrill Lynch, Barclays, BNP Paribas, Citigroup, Crédit Agricole, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JPMorgan, Mitsubishi UFJ, Morgan Stanley, RBS, Société Générale and UBS. Pre-crisis data also include Bear Stearns, Lehman Brothers and Merrill Lynch.

Large-scale redemptions from funds with material liquidity mismatch could result in sales of illiquid assets. If these sales exceed the ability of dealers and other investors to absorb them, this could reduce market liquidity. These effects could be amplified if resulting falls in prices lead to further asset sales by investors.

For example, in February, high-yield corporate bond open-ended funds experienced accelerated outflows, in contrast to close to zero net flows from equity funds — despite the fact equity prices fell much more than high-yield corporate bond prices (**Chart B.12**). While this episode did not lead to disruption to wider corporate bond market liquidity conditions, it is possible that this behaviour could prove more disruptive in the event of a larger or more corporate bond focused shock.

Funds do have liquidity tools, such as fair value pricing and fund suspensions, which can be used to limit redemptions under stress. However, use of such tools may not be sufficient to eliminate risks of large redemptions and expectations that such measures could be imposed could encourage redemptions in a stress.

Regulators are working together to ensure that the structures of these funds are resilient.

Given these potential vulnerabilities in a range of funds, the Board of the International Organization of Securities Commissions (IOSCO) published recommendations on liquidity risk management for collective investment schemes in February 2018.(3) The FCA will consult on a package of new rules and guidance for open-ended funds investing in illiquid assets that takes on board the responses received to their 2017 discussion paper as well as the IOSCO recommendations.(4) In February, the European Systemic Risk Board (ESRB) also published a recommendation on action to address system risks related to liquidity mismatches in investment funds.(5)

Dealers play a crucial role in some markets, and are more resilient now…

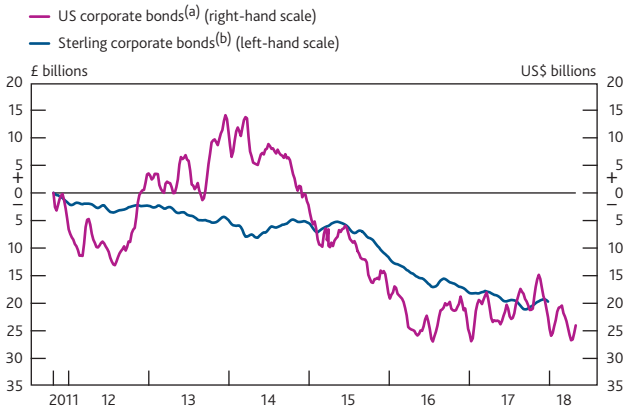
Dealers play an important role in intermediating between buyers and sellers in many important markets, especially fixed income markets. This often relies on dealers being willing to 'warehouse' assets that are waiting for a buyer. Dealers also provide short-term financing to other investors who may act as buyers of assets.

Some post-crisis reforms have made dealers much stronger. Measures of dealer resilience remain robust. For example, the aggregate leverage ratio of the world's largest dealers was 5.3% at end-March 2018 (**Chart B.13**).

(3) The Board of the International Organization of Securities Commissions (February 2018), 'Recommendations for liquidity risk management for collective investment schemes'.
(4) FCA Business Plan 2018/19.
(5) Recommendation of the European Systemic Risk Board (ESRB) on liquidity and leverage risks in investment funds (February 2018).

Chart B.14 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 of US primary dealer net positions in US corporate bonds. Data from 2 November 2011 to 2 May 2018.
(b) 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 27 December 2017. Differences in this series to the November *Report* owe to an improvement in the set of eligible securities considered.

…but may be less willing to act as intermediaries, particularly during periods of stress.

However, these reforms might have constrained the ability and willingness of dealers to act as intermediaries, particularly during periods of stress.

For example, dealers' inventories of both sterling and US corporate bonds have fallen (**Chart B.14**). Consistent with this, analysis by Bank staff suggests that, in response to sales of high-yield US corporate bonds by asset managers, the extent to which dealers are willing to see their inventories of corporate bonds increase is estimated to have shrunk by a factor of about seven compared to pre-crisis levels. And staff estimate that market prices would need to respond by twice as much to asset sales as they did pre-crisis, in order to attract other buyers in a short time frame.(6)

In the sterling corporate bond market, Bank staff estimate that a sharp increase in sterling investment-grade corporate bond spreads of around 70 basis points — a similar price movement to that seen during the global financial crisis — could test the capacity of dealers to absorb sales of these assets, further amplifying price falls.(7) In addition, a recent Bank study found that the sterling corporate bond market relies on a relatively small number of dealers. On average, the top three dealers account for around 40% of dealer activities.(8) This makes the market vulnerable to a reduction in the ability or willingness of a given dealer to intermediate.

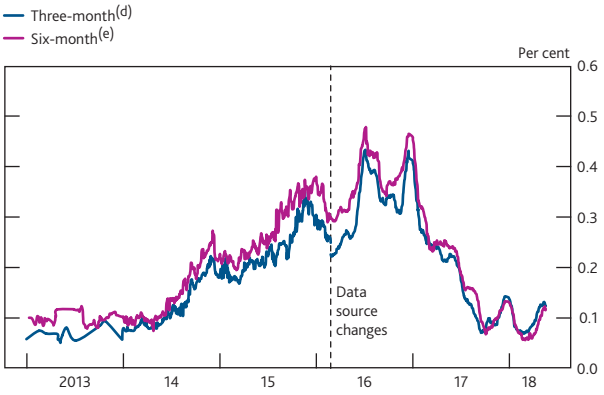
Dealers have increased their repo activity recently, but the drivers of this improvement may not be sustainable during stress.

Dealers also provide financing services to other investors, in particular through repo markets. Investors, such as hedge funds, life insurers and pension funds, use repo markets both to borrow cash by placing securities as collateral with dealers, and to borrow securities from dealers, offering finance in return. Even though these investors may ideally like to buy securities where others are forced sellers, they could be constrained from doing so if repo funding becomes less readily available. In the limit, they can become forced sellers themselves.(9)

(6) Impulse response analysis shows that following a one standard deviation decline in demand for high-yield corporate bonds, dealers are estimated to increase their bond holdings by 1.5 basis points of market volume in the pre-crisis period, as opposed to 0.2 basis points in the post-crisis period. Bond spreads would respond by more in the post-crisis period (17.3 basis points) than in the pre-crisis period (8.5 basis points). See July 2016 *Financial Stability Report*, Part B, Developments in market liquidity, page 29.
(7) The analysis extended the existing framework employed by the Bank's recent *Financial Stability Paper No. 42*, 'Simulating stress across the financial system: the resilience of corporate bond markets and the role of investment funds', by incorporating the behaviour of insurers, pension funds and unit-linked funds and accounting for different types of shocks to asset price fundamentals.
(8) Mallaburn, D, Roberts-Sklar, M and Silvestri, L (forthcoming), 'Resilience of trading networks: evidence from the sterling corporate bond market'.
(9) Repo is typically short term, introducing rollover risk — the risk that financing can be withdrawn or only rolled over at a higher cost. For example, hedge funds' ability to purchase assets is constrained by the amount and terms (eg haircuts) of repo funding that the dealer is willing to provide.

Chart B.15 Term gilt repo rates for asset managers have fallen

Term gilt repo rates paid by selected asset managers in excess of expectations of policy interest rates(a)(b)(c)

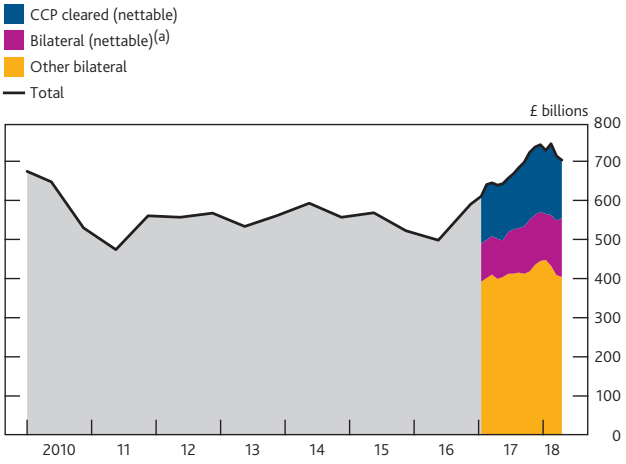


Sources: Data collected from a number of UK asset managers, Bank of England Sterling Money Market data collection and Bank calculations.

(a) Prior to March 2016, data were submitted to BIS CGFS Study Group by a number of UK asset managers. Data thereafter are from Bank of England Sterling Money Market data collection, and the calculation is based on 20-day moving average.
(b) After March 2016, selected asset managers include hedge funds.
(c) Expected policy interest rates are measured by three-month and six-month spot overnight indexed swap rates.
(d) After March 2016, data include repo with original maturity between 50 and 70 business days. Prior to March 2016, data include three-month and four-month maturities.
(e) After March 2016, data include repo with original maturity between 100 and 140 business days.

Chart B.16 The volume of outstanding gilt repo has grown since early 2016

Decomposition of growth in outstanding stock of gilt repo and reverse repo



Sources: Data collected from a number of UK asset managers, Bank of England Sterling Money Market data collection and Bank calculations.

(a) The volume of outstanding repo from bilateral netted activity (based on transactions between dealers and clients, with same maturity date) is an estimation of the maximum value that can be netted between the counterparties, if netting was agreed and agreements existed between the relevant counterparties.

There have been signs of an improvement in repo market functioning recently. For example, asset managers borrowing cash in gilt repo markets have experienced narrower spreads (**Chart B.15**). Consistent with this, the volume of outstanding gilt repo has grown by around 10% over the past 12 months (**Chart B.16**).

However, this improvement in repo market functioning may be reliant on new forms of repo intermediation that may not be sustainable in a stress. The majority (around 80%) of the recent increase in the volume of gilt repo is driven by repo loans that can be netted against repo borrowings with the same counterparty, which help to minimise the impact on dealers' regulatory costs (**Chart B.16**). These repo and reverse repo transactions include both those via central counterparties (CCPs) and bilateral transactions that are eligible for netting, such as those structured trades between dealers and their non-bank clients.(10) These transactions, for example, enable hedge funds to obtain leverage for exploiting arbitrage opportunities, thus supporting market liquidity, without impacting dealers' balance sheets. But it is unclear that market participants would be able to deploy these netting benefits following a shock that leads to a sharp increase in demand for cash.(11)

The FPC is studying how to better measure and track potential new risks that could be associated with leverage in the non-bank financial sector.

Following the financial crisis, G20 leaders agreed major reforms to global OTC derivatives markets. These reforms increased the use of CCPs, reduced the complexity of networks of derivative exposures, and therefore have improved the resilience of the financial system.(12)

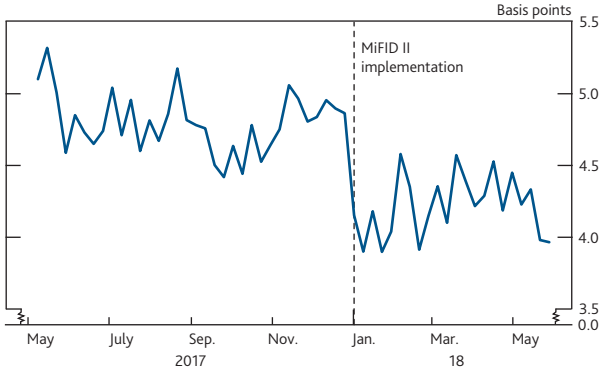
Investors can use these derivatives to increase exposure to a risk factor such as interest rates, or to hedge risk. However, if they do not have sufficient liquid assets to post margin, they may be forced to liquidate positions or fire-sell less liquid assets, affecting prices of financial assets and the functioning of markets.

The FPC has therefore commissioned an in-depth assessment of the role of leverage in the non-bank financial system. The assessment will also support the Bank and FCA's engagement with international work in this area. In January 2017, the FSB recommended that by the end of 2018 IOSCO should identify and/or develop consistent measures of leverage for the fund sector (see Box 4).

(10) These structured trades are so-called 'netting packages', which involve acquiring cash by borrowing and short-selling a piece of collateral (eg a bond) and entering into a series of netted repo transactions with the dealer.
(11) For example, nettable repo packages require hedge funds to borrow short-term government bonds, which could be difficult to source in stress. There is evidence that the amount of lendable securities and those on loan fell significantly during stress.
(12) See Financial Stability Board (June 2017), 'Review of OTC derivatives market reforms: effectiveness and broader effects of the reforms' and November 2017 *Financial Stability Report* — 'The FPC's assessment of post-crisis reforms to derivatives markets'.

Chart B.17 Bid-offer spreads on UK equities have fallen since the start of 2018

Average bid-offer spreads on FTSE 100 stocks and MiFID II implementation(a)



Sources: LiquidMetrix and Bank calculations.

(a) Market share weighted average of the bid-offer spread on the London Stock Exchange and CBOE CXE. Traded volume weighted average spread across all stocks in the index, taken at 30-second intervals across the trading week.

Markets where trading is undertaken electronically and at high frequency continue to evolve, especially given the implementation of MiFID II.

In some markets, such as equity markets, transactions take place primarily on exchanges, often at high frequency. The structure of some of these markets continues to evolve, especially in light of the implementation of MiFID II, a January 2018 revision to the legislation that allows firms to trade financial instruments across the European Union. The legislation (alongside certain provisions in MiFIR) contains a number of measures designed to improve the resilience of market-based finance. For example, it aims to increase the amount of trading that is undertaken on trading venues, and the transparency of that trading. There is evidence that the bid-offer spreads on FTSE 100 stocks have fallen since the start of 2018 (**Chart B.17**). The FPC will continue to monitor the impact of the introduction of MiFID II on the resilience of market-based finance over time.

As noted in the November 2017 *Report*, banks' — and their clients' — algorithmic trading activity can be a significant source of risk. The FCA and PRA have been reviewing firms' algorithmic trading activity and have issued supervisory publications.(13)

The November *Report* also noted that the growth of electronic and automated trading has given rise to a series of flash episodes. Several such episodes have occurred in markets that are among the largest and most liquid in the world, including the sterling flash episode on 7 October 2016. The FCA recently published an occasional paper examining the underlying drivers of this flash crash event.(14)

The Bank is continuing to develop a stress simulation to assess the resilience of markets under stress.

The Bank is continuing to invest in stress simulation models to explore how open-ended funds, hedge funds, dealers, insurance companies, unit-linked funds and pension funds might, through responding separately to their incentives and constraints, together amplify market shocks. Such work is particularly important given that the current system of market-based finance has yet to be tested by severe shocks and, because it has undergone significant changes, the system's past behaviour may not be a good guide to the future. The Committee will review this work as it progresses.

The FPC will monitor progress in mitigating the financial stability risks around Libor.

In March 2017, the FPC judged that continued reliance of financial markets on term Libor benchmarks created a risk to

(13) The FCA published a report based on its cross-firm reviews on themes relating to algorithmic trading, which summarises the key areas of focus and highlights examples of good and poor practice: www.fca.org.uk/publication/multi-firm-reviews/algorithmic-trading-compliance-wholesale-markets.pdf; the PRA published a supervisory statement on 15 June 2018, which sets out the PRA's expectations of a firm's risk management and governance of algorithmic trading: www.bankofengland.co.uk/prudential-regulation/publication/2018/algorithmic-trading-ss.

(14) *FCA Occasional Paper No. 37* (June 2018), 'Flash crash in an OTC market'.

financial stability.(15) Box 5 updates the FPC's assessment in light of developments over the past 15 months. Good progress has been made to establish potential alternatives to Libor. Nevertheless, the medium-term risks to market participants and financial stability more generally can be reduced only through a substantial and lasting transition away from reliance on Libor.

Two important market-led consultation exercises are due to be carried out soon that should — respectively — facilitate transition away from Libor for an important subset of end-users in sterling markets, and help coalesce views on the appropriate fallbacks for Libor. The FPC will monitor progress following these consultations and will report regularly on outstanding risks.

(15) FPC Record (September 2017).

Box 4
Measuring risks from leverage in the non-bank financial system

In its 2017 assessment of risk and regulation beyond the core banking sector, the FPC examined fragilities through which the non-bank financial system can affect financial stability. Leverage — a concept that affects many sectors of the economy — is one of those fragilities. Assessing risks from leverage in the non-bank financial system is particularly challenging: data gaps hinder the ability to observe leverage, and better definitions are needed by which to measure leverage.

The FPC asked for an in-depth assessment of the role of leverage across the non-bank financial system, especially leverage created through the use of derivatives (sometimes referred to as 'synthetic leverage'). The full assessment, undertaken jointly with the FCA, will be reported in the December *Report* and will support the UK's engagement with international initiatives to develop consistent measures of leverage for the fund sector. This box outlines initial work.

Risks from leverage to financial stability

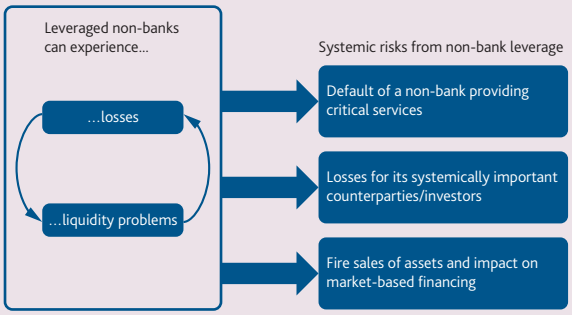
Leverage allows a financial institution to increase its exposure to a risk factor (such as interest rates or economic growth) beyond what would be possible through a direct investment of its own funds in an instrument exposed to those factors. Leverage can be generated in two ways: first, by borrowing and investing the proceeds in more instruments exposed to the risk factors; or second, through instruments that directly amplify exposures, such as derivatives.

Leverage that is used to amplify a firm's overall exposure to risk may raise the probability of default of that firm, and so increase risks to financial stability (**Figure A**).

In the extreme, the default of a non-bank providing critical services (such as insurance) can result in an interruption in the provision of those services. Even if the failing non-bank is not systemically important itself, it can still cause losses for its systemically important counterparties (eg banks).

In contrast, leverage that is used to offset (rather than increase) or 'hedge' a firm's existing exposure to a risk factor may lower the probability of default of that firm. For example, a financial institution can enter into a credit default swap contract to protect itself from the risk that bonds it has invested in default. Such hedging activity is a useful risk management tool and can reduce solvency-related financial stability risks. So a key challenge in measuring risks from leverage is to try and distinguish between the use of leverage to take additional risk and to hedge existing risk.

Figure A Financial stability risks from leverage



Whatever their motivation, transactions to generate leverage can give rise to liquidity problems that firms need to manage. Derivatives transactions, for example, are typically accompanied by a requirement for the two parties involved to place collateral with one another, depending on the value of the derivative. A sudden increase in collateral calls can lead to liquidity problems.

An example of this risk crystallising is US insurer AIG in 2008, following falls in the value of mortgage-related securities on which it had sold protection. As an AAA-rated company, AIG's counterparties had not previously required much collateral against these exposures. But as the firm's own rating was also downgraded, AIG was faced with US$40 billion of collateral calls. To obtain collateral, AIG was forced into 'fire sales' of assets and eventually relied on US authorities for funding support.

Post-crisis reforms have dramatically reduced some of these risks. In particular, higher capital requirements for banks and insurers have increased their ability to absorb losses, while greater central clearing has reduced the counterparty risk associated with a given amount of derivatives trading. Derivatives positions must also be properly collateralised every day.(1)(2)

Banks are further required to hold sufficient liquid assets to cover liquidity outflows related to derivatives exposures as part of the Liquidity Coverage Ratio and liquidity risk monitoring requirements.(3) In contrast, however, while non-bank financial institutions have their own risk management practices to mitigate liquidity risk, they do not face quantitative liquidity regulation.

(1) Derivatives margin requirements have two components. Initial margin is posted at the beginning of a transaction to cover potential future adverse changes in the market value of the contract, and is recalculated on a regular basis. Variation margin is exchanged to cover actual changes in the market value of the contract during its life.
(2) For centrally cleared derivatives, that requirement is in place today. Requirements for margin on new uncleared derivatives are currently being introduced and will be completed by 2020.
(3) See 'Basel III: The Liquidity Coverage Ratio and liquidity risk monitoring tools'.

The risk therefore remains that non-bank financial institutions might not have sufficient liquid assets to post collateral for mark-to-market declines in the value of their derivatives portfolio ('variation margin').(4) In that event, they may be forced to liquidate positions or fire-sell less liquid assets. Such fire sales can cause financial asset prices to fall quickly, and to levels below those implied by the cash flows that the assets are expected to generate, thereby impairing the functioning of markets.(5)

An assessment of systemic risks from leverage needs to consider whether large but plausible movements in a given risk factor can lead to margin calls in excess of non-banks' holdings of cash or other liquid assets.

Assessing risks from the use of derivatives transactions: the need for risk-based measures

For many non-bank financial institutions, the primary method of generating leverage is to use derivatives.

A common way to measure and report leverage embedded in derivatives relies on the notional amounts the derivatives contracts are written on. These amounts are often simply reference amounts (eg the value against which to calculate payments in a swap), rather than potential exposure of a derivative. Aggregating the absolute values of these notional amounts then produces a single measure of leverage, referred to as gross notional exposure (GNE). This measure is frequently used in derivatives regulations as a threshold to determine whether certain requirements will apply.(6) While GNE does indicate whether derivatives are used, it is not informative about their potential solvency or liquidity risks.

This is because:

- Notional amounts say nothing about the sensitivity of the derivatives to different risk factors. For example, two identical notional amounts could have underlying risk factors with different volatilities (eg interest rates versus commodities) and therefore different risk profiles. But GNE would not distinguish between the two.

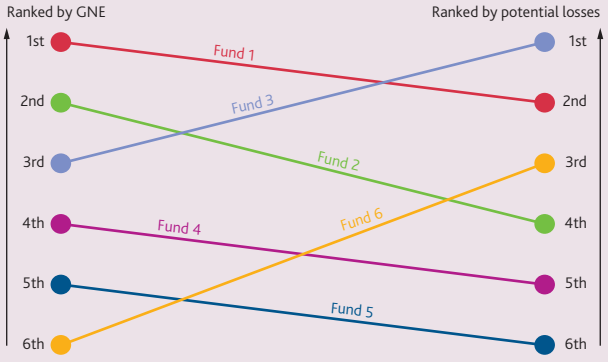
- Aggregating absolute values ignores the potential for offsetting exposures. For example, a portfolio with £100 million of 10-year interest rate swaps paying floating rate will have the same GNE (£100 million) as a portfolio consisting of £50 million of nine-year interest rate swaps paying floating rate and £50 million of offsetting 11-year interest rate swaps (paying fixed and receiving floating rate). But these two portfolios will have very different risk profiles.

- There is no distinction made as to the purpose of the exposure. So an institution with a large notional amount of interest rate swaps used for hedging, and therefore reducing exposure to risk, could have a higher GNE than an institution with a small notional amount of credit default swaps used for increasing exposure to credit risk.

Chart A illustrates how GNE is not a meaningful way of assessing potential losses on interest rate derivatives. For a sample of hedge funds to which global banks have large exposures, it compares (i) how the funds rank according to their GNE in USD interest rate swaps (left-hand side) to (ii) how the funds rank according to the potential losses those interest rate swaps could incur based on historical market moves (right-hand side). GNE fails to identify funds with higher potential losses. For example, Fund 3 in **Chart A** has the highest potential loss, but only third highest GNE.

Chart A GNE does not rank funds in line with losses implied by historical stress

Ranking a selection of hedge funds by gross notional exposures versus losses from historical stress for USD interest rate swaps(a)(b)



Sources: Bloomberg Finance L.P., DTCC Derivatives Repository Limited and Bank calculations.

(a) Potential losses for each fund's portfolio as of 17 October 2017 are estimated using the worst 20-day period for that portfolio over the previous 13 years.
(b) Hedge funds selected are those to which global banks have the largest exposure in the Bank's April 2017 Hedge Fund as Counterparty Survey.

A range of better, risk-based measures are needed to capture the risks from leverage.

Better risk-based metrics need to be more informative about the potential losses and liquidity demands generated by derivatives. For example, a metric aimed to measure the potential for liquidity problems associated with leverage needs to be informative about potential variation margin calls on individual derivative positions, as well as taking into account

(4) While initial margin requirements can also change in stress, they are likely to be quite stable over the financial cycle for uncleared transactions. For centrally cleared trades, initial margin requirements increases are dampened by 'anti-procyclicality' mechanisms specified in EU regulations. See 'The FPC's assessment of post-crisis reforms to derivatives markets', November 2017 *Financial Stability Report*.
(5) See Baranova, Y, Coen, J, Lowe, P, Noss, J and Silvestri, L (2017), 'Simulating stress across the financial system: resilience of corporate bond markets and the role of investment funds', *Bank of England Financial Stability Paper No. 42*.
(6) For example, global margin requirements for uncleared derivatives use notional amount to determine thresholds for the phase-in of initial margin rules. See pages 24–26; www.bis.org/bcbs/publ/d317.pdf.

the fact that offsetting exposures with different counterparties do not necessarily result in reduced liquidity demands from margin calls.

It is also important that measures can be compared and aggregated across non-bank entities and sectors.

Bank and FCA staff are continuing their in-depth assessment of leverage metrics and risks from leverage in the non-bank financial system.

The assessment will also support the Bank and FCA's engagement with international work in this area. In January 2017, the Financial Stability Board (FSB) recommended that by the end of 2018 the International Organization of Securities Commissions (IOSCO) should identify and/or develop consistent measures of leverage for the fund sector.

In its implementation of the FSB's leverage recommendations, the FPC encourages IOSCO to consider a range of risk-based metrics that measure the potential losses and liquidity problems generated by leverage.

Box 5
Financial stability risks around Libor

In March 2017, the FPC judged that continued reliance of financial markets on term Libor benchmarks created a risk to financial stability.(1)

That judgement reflected:

1. **The scarcity of unsecured deposit transactions to inform banks' term Libor submissions**. In 2017 UK banks took on average just £187 million of three-month sterling deposits each day.(2) The figure for six-month deposits was £87 million.(3) The lack of longer-term transactions poses a risk to the medium-term sustainability of term Libor benchmarks.

2. **The scale of financial contracts that used Libor as a reference rate**. Over £30 trillion(4) of financial contracts are linked to three and six-month sterling Libor. These are primarily interest rate swaps, interest rate futures, cross-currency basis swaps, syndicated loans and floating-rate notes. Some US$200 trillion(5) of financial contracts reference US$ Libor.

3. **Lack of clarity on the legal position of Libor-referencing contracts should Libor become unavailable**. This reflects the fact that, in many cases, existing Libor-referencing contracts lack robust 'fallback' rates.

This box updates the FPC's assessment in light of developments over the past 15 months.(6)

Good progress has been made in several areas:

- Market-led working groups in key jurisdictions have identified preferred alternatives to Libor. These are robust overnight rates, firmly grounded in transactions data. In the UK the Working Group on Sterling Risk-Free Reference Rates recommended SONIA, administered by the Bank of England, as its preferred risk-free rate. The Bank implemented reforms aimed at strengthening SONIA on 23 April 2018.(7) In the US the market-led Alternative Reference Rate Committee chose the secured overnight financing rate (SOFR), a benchmark produced by the Federal Reserve Bank of New York, which was launched on 3 April 2018.

- The same market-led groups have been co-ordinating important groundwork for the other elements of the transition away from Libor. In the UK, an active swap market referencing SONIA has long existed; futures referencing SONIA have now been launched successfully; and work has begun to develop conventions, standards and template documentation for loans and bonds referencing SONIA.

- In November 2017 the Financial Conduct Authority secured the agreement of the Libor panel banks to continue submitting to Libor until the end of 2021. This provides a window for transition to alternative rates — but after 2021 the availability of Libor cannot be assured.

In addition, Libor's administrator (ICE Benchmark Administration) is implementing changes to aspects of the benchmark-setting process. However these are not able to address the fundamental challenge to the medium-term sustainability of term Libor benchmarks — the lack of underlying transactions.

The risk that Libor will become unavailable after 2021 means that market participants will — in managing their own financial exposures and risks — need to transition away from reliance on Libor.

This is a difficult and complex exercise because use of Libor is deeply embedded in current business practices; and is supported by the continuing need to hedge and manage legacy Libor positions.

Chart A shows that market participants continue to accumulate Libor-linked sterling derivatives for periods well after 2021: for example, since July 2017 the growth in cleared derivatives contracts exceeded their rate of roll-off. As long as the stock of Libor-linked sterling derivatives continues to increase, the medium-term risks to financial stability will grow.

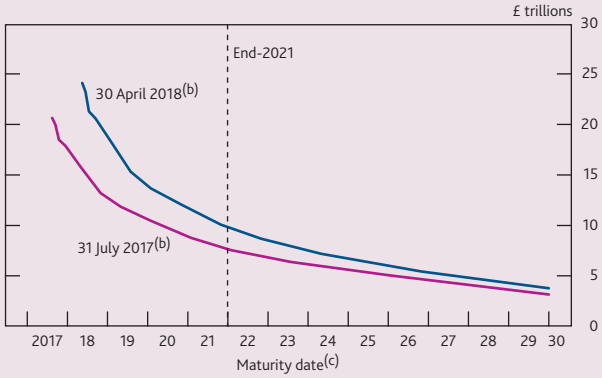
The medium-term risks can be reduced only through a substantial and lasting transition away from reliance on Libor. In addition, ongoing work to develop and implement more robust fallback clauses in existing contracts will be critical in mitigating these risks.

Two important market-led consultation exercises are due to be carried out soon that should — respectively — facilitate transition away from Libor for an important subset of end-users in sterling markets, and help coalesce views on the appropriate fallbacks for Libor.

(1) www.bankofengland.co.uk/record/2017/financial-policy-committee-september-2017.
(2) For comparison another key sterling interest rate benchmark, the sterling overnight index average (SONIA), measures the rate on an average of £50 billion of overnight deposits.
(3) www.bankofengland.co.uk/quarterly-bulletin/2018/2018-q1/sterling-money-markets-beneath-the-surface.
(4) www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2018/February/LIBOR-transition-POV-FINAL.pdf.
(5) www.newyorkfed.org/medialibrary/Microsites/arrc/files/2018/ARRC-Second-report.
(6) The FPC received an interim update in September 2017.
(7) www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/sonia-key-features-and-policies.pdf.

Chart A Roll-off of outstanding notional for cleared GBP Libor derivatives

Growth in cleared derivatives contracts referencing GBP Libor exceeded their rate of roll-off[a]



Sources: Bank and FCA estimates based on LCH data provided to the FCA.

(a) Includes gross notional outstanding of all interest rate derivatives with a GBP Libor-linked floating leg, cleared at LCH Ltd excluding inflation swaps.
(b) 31 July 2017 and 30 April 2018 refer to observation dates for roll-off profile. The chart presumes no new trades are transacted after the observation dates.
(c) Maturity date calculated based on trades as of 31 July 2017 and as of 30 April 2018 observation dates including interpolation where necessary.

First, the Working Group on Sterling Risk-Free Reference Rates will consult on the development of a potential forward-looking term benchmark based on SONIA.

The drive to reduce reliance on Libor has focused on the use of overnight near risk-free rates like SONIA and SOFR as the most suitable alternatives to Libor for use in derivatives markets.

However forward-looking term benchmarks are seen by many loan and bond market participants as essential for their business needs. The development of a term SONIA reference rate should therefore help facilitate transition of new business away from sterling Libor in these markets.

Second, the International Swaps and Derivatives Association is preparing a market consultation on the fallback rate that should replace Libor in derivatives documentation should Libor cease to be produced.

Once a fallback rate is agreed, the aim would be to implement it in new derivatives contracts, and also to amend existing contracts.

Such fallbacks are not intended as a substitute for the conversion of existing contracts before Libor becomes unavailable. Instead the implementation of fallback clauses in new and existing contracts is a backstop to mitigate the largest financial stability risks.

The agreement of a fallback for derivatives markets may help to set a precedent for other markets. However the amendment of existing contracts in other markets (such as loan and bond markets) may prove challenging, and is an issue on which further work is required.

The FPC will monitor progress following these consultations and will report regularly on outstanding risks.

Libor is an internationally used benchmark, and transition will require close cross-border co-ordination. Different jurisdictions will have to find solutions to similar issues, and international firms are exposed to Libor in different currencies. Mechanisms for such co-ordination exist, including through the international Official Sector Steering Group (OSSG), which reports to the Financial Stability Board, and regular informal contact between national market-led risk-free rate working groups. The OSSG will publish a progress report in 2018.

Annex 1: Previous macroprudential policy decisions

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

Each Recommendation or Direction has been given an identifier to ensure consistent referencing over time. For example, the identifier 17/Q2/1 refers to the first Recommendation made at the 2017 Q2 Committee meeting.

Recommendations implemented or withdrawn since the previous *Report*

There are no Recommendations that have been implemented or withdrawn since the November 2017 *Report*.

Recommendations and Directions currently outstanding

There are currently no Recommendations or Directions awaiting implementation.

Other FPC policy decisions

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

Countercyclical capital buffer (CCyB)

The FPC agreed at its meeting in June to set the UK CCyB rate at 1%. This rate is reviewed on a quarterly basis.

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

Recommendation on loan to income ratios

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

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

The PRA and the FCA have published approaches to implementing this Recommendation: the PRA issued a Policy Statement in October 2014, including rules, and the FCA issued general guidance in October 2014 which it clarified in February 2017.

The FPC reviewed this Recommendation in June 2017 and decided not to amend the calibration. The explanation for this is set out in the June 2017 *Financial Stability Report*.

FPC Recommendation on mortgage affordability tests

In June 2017, the FPC made the following Recommendation (17/Q2/1), revising its June 2014 Recommendation:

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

Lenders were required to have regard to the FPC's June 2017 revision to its June 2014 affordability Recommendation immediately, by virtue of the existing FCA MCOB rule. At its September 2017 meeting the FPC confirmed that the affordability Recommendation did not apply to any remortgaging where there is no increase in the amount of borrowing, whether done by the same or different lender.

Other FPC activities since the previous *Report*

At its meeting on 12 March 2018 the FPC reviewed the financial stability risks from crypto-assets. It recognised the potential benefits of the technologies underlying crypto-assets and of their potential to create a more distributed and diverse payments system. It judged that existing crypto-assets did not currently pose a material risk to UK financial stability. The FPC set out that it would aim to ensure the core of the UK financial system remained protected if linkages between crypto-assets and systemically important financial institutions or markets were to grow significantly. For more details see the Record of the meeting on 12 March 2018.

As required by statute, the FPC also reviewed in March its framework for calibrating the systemic risk buffer, which would apply to ring-fenced banks and large building societies that hold more than £25 billion in deposits and shares, excluding deferred shares, from 2019. The statutory obligation was to review this at least every second year and the FPC had initially set the framework in May 2016. The FPC judged that, at that stage, there was no evidence that warranted any changes to the framework.

The FPC also considered an ESRB Recommendation for relevant authorities to reciprocate a risk-weight increase imposed by the Finnish Financial Supervisory Authority (FIN-FSA). The FPC decided no action was necessary as no UK credit institution had exposures exceeding the materiality threshold proposed by FIN-FSA.

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 15 June 2018)
Non-bank balance sheet stretch[d]						
1 Credit to GDP[e]						
Ratio	121.3%	163.6%	86.6%	177.7%	149.6%	149.2% (2017 Q4)
Gap	7.4%	9.4%	-28.7%	21.0%	-18.0%	-15.6% (2017 Q4)
2 Private non-financial sector credit growth[f]	9.9%	9.3%	-2.0%	23.9%	5.8%	5.1% (2017 Q4)
3 Net foreign asset position to GDP[g]	4.0%	-6.3%	-29.0%	21.4%	-4.4%	-12.8% (2017 Q4)
4 Gross external debt to GDP[h]	181.7%	317.4%	113.3%	403.1%	310.5%	313.4% (2017 Q4)
of which bank debt to GDP	*120.0%*	*194.2%*	*77.8%*	*266.4%*	*175.6%*	*176.0% (2017 Q4)*
5 Current account balance to GDP[i]	-1.9%	-3.1%	-7.1%	0.5%	-4.6%	-3.6% (2017 Q4)
Conditions and terms in markets						
6 Long-term real interest rate[j]	1.45%	1.23%	-2.05%	2.18%	-1.52%	-1.52% (15 June 2018)
7 VIX[k]	19.1	12.8	9.8	65.5	10.9	13.1 (15 June 2018)
8 Global corporate bond spreads[l]	84 bps	84 bps	74 bps	482 bps	113 bps	113 bps (15 June 2018)
9 Spreads on new UK lending						
Household[m]	480 bps	352 bps	284 bps	849 bps	637 bps	612 bps (Apr. 2018)
Corporate[n]	104 bps	97 bps	82 bps	392 bps	225 bps	217 bps (Dec. 2017)
Bank balance sheet stretch[o]						
10 Capital ratio						
Basel II core Tier 1[p]	6.6%	6.3%	6.1%	12.3%	n.a.	n.a.
Basel III common equity Tier 1[q]	n.a.	n.a.	n.a.	n.a.	13.9%	14.6% (2018 Q1)
11 Leverage ratio[r]						
Simple	4.7%	4.1%	2.9%	6.9%	6.6%	6.9% (2017 H2)
Basel III (2014 proposal)	n.a.	n.a.	n.a.	n.a.	4.9%	5.0% (2017 H2)
12 Average risk weights[s]	53.6%	46.4%	32.0%	65.4%	33.4%	32.0% (2017 H2)
13 Return on assets before tax[t]	1.0%	1.1%	-0.2%	1.5%	0.3%	0.6% (2017 H2)
14 Loan to deposit ratio[u]	114.5%	132.4%	93.8%	133.3%	94.0%	93.8% (2017 H2)
15 Short-term wholesale funding ratio[v]	n.a.	24.6%	10.1%	26.7%	10.1%	11.9% (end-2017)
of which excluding repo funding	*n.a.*	*15.8%*	*4.3%*	*15.8%*	*4.9%*	*4.3% (end-2017)*
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 2017 Q1: CH, DE, JP, KY, NL, TW	In 2018 Q1: AU, CN, DE, FR, JP, KR, NL, SG, TW, US
17 CDS premia[y]	12 bps	8 bps	6 bps	298 bps	40 bps	50 bps (June 2018)
18 Bank equity measures						
Price to book ratio[z]	2.13	1.94	0.50	2.86	0.88	0.88 (June 2018)
Market-based leverage ratio[aa]	9.7%	7.8%	1.9%	15.7%	5.6%	5.5% (June 2018)

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 15 June 2018)
Bank balance sheet stretch[o]						
1 Capital ratio						
Basel II core Tier 1[p]	6.6%	6.3%	6.1%	12.3%	n.a.	n.a.
Basel III common equity Tier 1[q]	n.a.	n.a.	n.a.	n.a.	13.9%	14.6% (2018 Q1)
2 Leverage ratio[r]						
Simple	4.7%	4.1%	2.9%	6.9%	6.6%	6.9% (2017 H2)
Basel III (2014 proposal)	n.a.	n.a.	n.a.	n.a.	4.9%	5.0% (2017 H2)
3 Average mortgage risk weights[ab]	n.a.	n.a.	11.6%	22.4%	12.6%	11.6% (2017 H2)
UK average mortgage risk weights[ac]	n.a.	n.a.	10.0%	15.8%	10.5%	10.0% (2017 H2)
4 Balance sheet interconnectedness[ad]						
Intra-financial lending growth[ae]	12.0%	13.0%	-20.6%	45.5%	5.1%	-17.0% (2017 H2)
Intra-financial borrowing growth[af]	14.1%	13.7%	-21.5%	33.3%	33.3%	1.8% (2017 H2)
Derivatives growth (notional)[ag]	37.7%	34.2%	-25.9%	52.0%	12.1%	-5.7% (2017 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 2017 Q1: KY, US	In 2018 Q1: CA, FR, HK, SG, US
Non-bank balance sheet stretch[d]						
6 Credit growth						
Household[ai]	10.7%	10.9%	-0.9%	21.6%	4.5%	4.3% (2017 Q4)
Commercial real estate[aj]	15.3%	18.5%	-9.7%	59.8%	0.6%	-1.5% (2018 Q1)
7 Household debt to income ratio[ak]	98.1%	139.1%	77.2%	147.0%	130.6%	133.2% (2017 Q4)
8 PNFC debt to profit ratio[al]	266.3%	363.8%	157.9%	431.2%	315.2%	311.9% (2017 Q4)
9 NBFI debt to GDP ratio (excluding insurance companies and pension funds)[am]	54.8%	128.3%	13.7%	173.0%	123.2%	125.3% (2017 Q4)
Conditions and terms in markets						
10 Real estate valuations						
Residential price to rent ratio[an]	100.0	151.0	66.9	160.5	142.8	145.6 (2018 Q1)
Commercial prime market yields[ao]	5.4%	4.1%	3.8%	7.1%	4.0%	3.8% (2018 Q1)
Commercial secondary market yields[ao]	8.5%	5.6%	5.1%	10.2%	6.0%	6.0% (2018 Q1)
11 Real estate lending terms						
Residential mortgage LTV ratio (mean above the median)[ap]	90.6%	90.6%	81.6%	90.8%	87.3%	87.3% (2018 Q1)
Residential mortgage LTI ratio (mean above the median)[ap]	3.8	3.8	3.6	4.2	4.2	4.2 (2018 Q1)
Commercial real estate mortgage LTV (average maximum)[aq]	77.6%	78.3%	57.0%	79.6%	57.5%	57.0% (2017 H2)
12 Spreads on new UK lending						
Residential mortgage[ar]	80 bps	50 bps	35 bps	379 bps	162 bps	105 bps (Apr. 2018)
Commercial real estate[as]	137 bps	135 bps	119 bps	422 bps	254 bps	255 bps (2017 Q4)

* The FPC considers this set of core indicators when reaching decisions on the UK countercyclical capital buffer (CCyB) rate. Firms use the UK CCyB rate to calculate their institution-specific CCyB rate and the countercyclical leverage ratio buffer (CCLB) rate. Currently, the CCLB rate for each major UK bank is calculated as 35% of its institution-specific CCyB rate with the CCLB rate percentage rounded to the nearest 10 basis points.

(a) A spreadsheet of the series shown in this table is available at www.bankofengland.co.uk/financial-stability.

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

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

(d) The current vintage of ONS data is not available prior to 1997. Data prior to this and beginning in 1987 have been assumed to remain unchanged since *The Blue Book 2013*.

(e) Credit is defined as debt claims on the UK private non-financial sector. This includes all liabilities of the household and not-for-profit sector except for the unfunded pension liabilities and financial derivatives of the not-for-profit sector, and private non-financial corporations' (PNFCs') loans and debt securities excluding direct investment loans and loans secured on dwellings. The credit to GDP gap is calculated as the percentage point difference between the credit to GDP ratio and its long-term trend, where the trend is based on a one-sided Hodrick-Prescott filter with a smoothing parameter of 400,000. See Countercyclical Capital Buffer Guide at www.bankofengland.co.uk/financial-stability for further explanation of how this series is calculated. Sources: ONS, Revell, J and Roe, A (1971), 'National balance sheets and national accounting — a progress report', *Economic Trends*, No. 211, UK Finance and Bank calculations.

(f) Twelve-month growth rate of nominal credit (defined as the four-quarter cumulative net flow of credit as a proportion of the stock of credit twelve months ago). Credit is defined as above. Sources: ONS and Bank calculations.

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

(h) Ratios computed using a four-quarter moving sum of GDP. Monetary financial institutions (MFIs) cover banks and building societies resident in the United Kingdom. Sources: ONS and Bank calculations.

(i) As per cent of quarterly GDP. Sources: ONS and Bank calculations.

(j) Five-year real interest rates five years forward, implied from inflation swaps and nominal fitted yields. Data series runs from October 2004. Sources: Bloomberg Finance L.P., Tradeweb and Bank calculations.

(k) Measure of market expectations of 30-day volatility. Conveyed by S&P 500 stock index option prices (one-month moving average). Sources: Bloomberg Finance L.P. and Bank calculations.

(l) Global corporate bond spreads refers to a one-month moving average of the global aggregate market non-financial corporate bond spread. This tracks the performance of investment-grade corporate debt publicly issued in the global and regional markets from both developed and emerging market issuers. Index constituents are weighted based on market value. Spreads are option-adjusted (ie they show the number of basis points the matched-maturity government spot curve needs to be shifted in order to match a bond's present value of discounted cash flows). Prior to 2016, published versions of this indicator showed the ICE/BofAML Global Industrial Index. Sources: Barclays and Bank calculations.

(m) The household lending spread is a weighted average of mortgage and unsecured lending spreads, with weights based on relative volumes of new lending. The mortgage spread is a weighted average of quoted mortgage rates over risk-free rates, using 90% LTV two-year fixed-rate mortgages and 75% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products. Spreads are taken relative to Bank Rate for the tracker product. The unsecured component is a weighted average of spreads on credit cards, overdrafts and personal loans. Spreads on unsecured lending are taken relative to Bank Rate. FCA Product Sales Data includes regulated mortgage contracts only but is used to weight all mortgage products. Series starts in 1997. Sources: Bank of England, Bloomberg Finance L.P., FCA Product Sales Data, UK Finance and Bank calculations.

(n) The UK corporate lending spread is a weighted average of: SME lending rates over Bank Rate; CRE average senior loan margins over Bank Rate; and, as a proxy for the rate at which banks lend to large, non-CRE corporates, UK investment-grade company bond spreads over maturity-matched government bond yields (adjusted for any embedded option features such as convertibility into equity). Weights are based on relative amounts outstanding of loans. Series starts in October 2002. Sources: Bank of England, Bloomberg Finance L.P., Cass Commercial Real Estate Lending survey, Department for Business, Energy and Industrial Strategy, ICE/BofAML, UK Finance and Bank calculations.

(o) Unless otherwise stated, indicators are based on the major UK bank peer group defined as: Abbey National (until 2003); Alliance & Leicester (until 2007); Bank of Ireland (from 2005); Bank of Scotland (until 2000); Barclays; Bradford & Bingley (from 2001 until 2007); Britannia (from 2005 until 2008); Co-operative Banking Group (from 2005); Halifax (until 2000); HBOS (from 2001 until 2008); HSBC (from 1992); Lloyds TSB/Lloyds Banking Group; Midland (until 1991); National Australia Bank (from 2005 until February 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 capital divided by aggregate risk-weighted assets, according to the CRD IV definition as implemented in the UK. The Basel III peer group includes Barclays, Co-operative Banking Group, HSBC, Lloyds Banking Group, Nationwide, RBS and Santander UK. From 2018, the Basel III CET1 ratio reflects IFRS 9 transitional arrangements as agreed in European law.

(r) A simple leverage ratio calculated as aggregate shareholders' equity over aggregate assets. The Basel III (2014 proposal) series corresponds to aggregate CRD IV end-point Tier 1 capital over aggregate leverage exposures, using the CRR definition since 2015 and the 2014 proposal before that. This series consists of Barclays, HSBC, Lloyds Banking Group, Nationwide, RBS, Santander UK and The Co-operative Bank. Latest published figures have been used (2017 H2). In the case of Nationwide, these relate to 2017 H1. In August 2016, the PRA implemented the FPC Recommendation allowing firms subject to the leverage ratio framework in the United Kingdom to exclude certain claims on central banks from their leverage exposures; no adjustment has been made for this. Sources: PRA regulatory returns, published accounts and Bank calculations.

(s) Aggregate peer group risk-weighted assets divided by aggregate peer group published balance sheet assets according to applicable regulatory regimes. The series begins in 1992 and is annual until end-2012 and half-yearly onwards. Latest published figures have been used (2017 H2). In the case of Nationwide, these relate to 2017 H1. Sources: Published accounts and Bank calculations.

(t) Calculated as major UK banks' profit before tax as a proportion of total assets, averaged over the current and previous year. When banks in the sample have merged, aggregate profits for the year are approximated by those of the acquiring group. Series is annual until 2015 when it becomes semi-annual. The latest value uses latest published figures, in the case of Nationwide these relate to 2017 H1. Sources: Published accounts and Bank calculations.

(u) Major UK banks' loans and advances to customers as a percentage of customer deposits, where customer refers to all non-bank borrowers and depositors. Repurchase agreements are excluded from loans and deposits where disclosed. One weakness of the current measure is that it is not possible to distinguish between retail deposits from households and deposits placed by non-bank financial corporations on a consolidated basis. Additional data collections would be required to improve the data in this area. The series begins in 2000 and is annual until end-2012 and half-yearly afterwards. The latest value uses latest published figures, in the case of Nationwide relates to 2017 Q3. 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. Sources: Published accounts and Bank calculations.

(w) This indicator highlights the countries where UK-owned monetary financial institutions' (MFIs') overall exposures are greater than 10% of UK-owned MFIs' tangible equity on an ultimate risk basis and have grown by more than 1.5 times nominal GDP growth in that country. Foreign exposures as defined in BIS consolidated banking statistics. Uses latest data available, with the exception of tangible equity figures for 2006–07, which are estimated using published accounts. Sources: Bank of England, ECB, IMF *World Economic Outlook* (*WEO*), Thomson Reuters Datastream, published accounts and Bank calculations.

(x) Abbreviations used are: Australia (AU), Brazil (BR), Canada (CA), Switzerland (CH), People's Republic of China (CN), Germany (DE), Spain (ES), France (FR), Hong Kong (HK), Ireland (IE), India (IN), Italy (IT), Japan (JP), Republic of Korea (KR), Cayman Islands (KY), Luxembourg (LU), Netherlands (NL), Singapore (SG), Taiwan (TW), United States (US) and South Africa (ZA).

(y) Average of major UK banks' five-year senior CDS premia, weighted by total assets until 2014 and by half-year total assets from 2015. Series starts in 2003. In the latest value Nationwide's senior CDS is weighted by 2017 H1 total assets as the latest published figures relate to 2017 H1. The Co-operative Bank fell out of the population on 17 June 2017. 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 are weighted by end-year total assets until 2014 and by half-year assets from 2015. The sample comprises the major UK banks and National Australia Bank between 2005 and 2015 H2, excluding Britannia, Co-operative Banking Group and Nationwide. Northern Rock/Virgin Money is excluded from 2008. Series starts in 2000. Sources: Bloomberg Finance L.P., Thomson Reuters Datastream, published accounts and Bank calculations.

(aa) Total peer group market capitalisation divided by total peer group assets (note a discontinuity due to introduction of IFRS accounting standards in 2005, which tends to reduce leverage ratios thereafter). The sample comprises the major UK banks, excluding Britannia, Co-operative Banking Group and Nationwide. National Australia Bank is included between 2005 and 2015 H2. Northern Rock/Virgin Money is excluded from 2008. Series starts in 2000. Sources: Bloomberg Finance L.P., Thomson Reuters Datastream, published accounts and Bank calculations.

(ab) Sample consists of Barclays Group, Co-operative Banking Group, HSBC Holdings Group, Lloyds Banking Group, Nationwide Building Society Group, RBS Group, Santander UK Group and excludes Nationwide for 2008 H2 only. Average risk weights for residential mortgages (exposures on the Retail IRB method only) are calculated as total risk-weighted assets divided by total exposure value for all banks in the sample. Calculated on a consolidated basis, except for Nationwide for 2014 H2/2015 H1 where only solo data were available. Series starts in 2009 and is updated half-yearly. Sources: PRA regulatory returns and Bank calculations.

(ac) Sample consists of Bank of Scotland, Barclays Bank, HSBC Bank, Lloyds Bank, National Westminster Bank, Nationwide, Santander UK, Co-operative Bank, Royal Bank of Scotland, Ulster Bank and excludes Nationwide for 2008 H2 only. Average risk weights for residential mortgages (exposures on the Retail IRB method only) are calculated as total risk-weighted assets divided by total exposure value for all banks in the sample. Calculated on an unconsolidated basis, Royal Bank of Scotland data includes National Westminster, Ulster Bank and RBS. Historical data updated as of June 2016 to improve data series consistency. Series starts in 2009 and is updated half-yearly. Sources: PRA regulatory returns and Bank calculations.

(ad) The disclosures the series are based on are not currently sufficient to ensure that all intra-financial activity is included in these series, nor is it possible to be certain that no real-economy activity is included. Additional data collections would be required to improve the data in this area. The intra-financial lending and borrowing growth series are adjusted for the acquisitions of Midland by HSBC in 1992, and of ABN AMRO by RBS in 2007 to avoid reporting large growth rates resulting from step changes in the size and interconnectedness of the major UK bank peer group. Series exclude National Australia Bank.

(ae) Lending to other banks and other financial corporations. Growth rates are year on year. Latest value shows growth rate for year to 2017 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 2017 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 2017 H2. Sources: Published accounts and Bank calculations.

(ah) This indicator highlights the countries where UK-owned MFIs' non-bank private sector exposures are greater than 10% of UK-owned MFIs' tangible equity on an ultimate risk basis and have grown by more than 1.5 times nominal GDP growth in that country. Foreign exposures as defined in BIS consolidated banking statistics. Overseas sectoral exposures cannot currently be broken down further at the non-bank private sector level. The intention is to divide them into households and corporates as new data become available. Uses latest data available, with the exception of tangible equity figures for 2006–07, which are estimated using published accounts. Sources: Bank of England, ECB, IMF *World Economic Outlook* (*WEO*), Thomson Reuters Datastream, published accounts and Bank calculations.

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

(aj) Four-quarter growth rate of UK-resident MFIs' loans to the real estate sector. The real estate sector is defined as: buying, selling and renting of own or leased real estate; real estate and related activities on a fee or contract basis; and development of buildings. Non seasonally adjusted. Quarterly data. Data cover lending in both sterling and foreign currency from 1998 Q4. Prior to this period, data cover sterling only. Source: Bank of England.

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

(al) Gross debt as a percentage of a four-quarter moving sum of gross operating surplus. Gross debt is measured as loans and debt securities excluding derivatives, direct investment loans and loans secured on dwellings. The corporate gross operating surplus series is adjusted for FISIM. Sources: ONS and Bank calculations.

(am) Gross debt as a percentage of four-quarter moving sum of nominal GDP. The NBFI sector includes all financial corporations apart from monetary financial institutions (ie deposit-taking institutions). This indicator additionally excludes insurance companies and pension funds. Sources: ONS and Bank calculations.

(an) Ratio between an average of the seasonally adjusted Halifax and Nationwide house price indices and RPI housing rent. The series is rebased so that the average between 1987 and 2006 is 100. Sources: Halifax/Markit, Nationwide, ONS and Bank calculations.

(ao) The prime (secondary) yield is the ratio between the weighted averages, across the lowest (highest) yielding quartile of commercial properties, of MSCI Inc.'s measures of rental income and capital values. Sources: MSCI Inc. and Bank calculations.

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

(aq) Average of the maximum offered loan to value ratios across major CRE lenders. Series starts in 2002. Sources: Cass Commercial Real Estate Lending survey and Bank calculations.

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

(as) The CRE lending spread is the average of senior loan margins across major CRE lenders relative to Bank Rate. Series starts in 2002. Sources: Bank of England, Bloomberg Finance L.P., Cass Commercial Real Estate Lending survey 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 15 June 2018)
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%	87.3%	87.3% (2018 Q1)
Owner-occupier mortgage LTI ratio (mean above the median)[d]	3.8	3.8	3.6	4.2	4.2	4.2 (2018 Q1)
Buy-to-let mortgage LTV ratio (mean)[e]	n.a.	n.a.	56.9%	75.4%	61.4%	56.9% (2017 Q4)
2 Household credit growth[f]	10.7%	10.9%	-0.9%	21.6%	4.5%	4.3% (2017 Q4)
3 Household debt to income ratio[g]	98.1%	139.1%	77.2%	147.0%	130.6%	133.2% (2017 Q4)
of which: mortgages[h]	*68.5%*	*101.0%*	*49.2%*	*109.4%*	*97.2%*	*97.8% (2017 Q4)*
of which: owner-occupier mortgages[i]	*77.5%*	*92.4%*	*64.6%*	*96.7%*	*80.4%*	*80.9% (2017 Q4)*
Conditions and terms in markets						
4 Approvals of loans secured on dwellings[j]	97,907	119,035	26,276	132,782	66,767	62,455 (Apr. 2018)
5 Housing transactions[k]	129,508	139,039	51,660	221,978	102,940	100,190 (Apr. 2018)
Advances to homemovers[l]	48,985	59,342	14,300	93,500	26,200	25,100 (Apr. 2018)
% interest only[m]	53.3%	31.0%	1.8%	81.3%	2.3%	2.4% (Apr. 2018)
Advances to first-time buyers[l]	39,179	33,567	8,500	55,800	25,800	26,700 (Apr. 2018)
% interest only[m]	52.1%	24.0%	0.0%	88.0%	0.0%	0.0% (Apr. 2018)
Advances to buy-to-let purchasers[l]	10,128	14,113	3,600	29,100	5,300	5,000 (Apr. 2018)
% interest only[n]	n.a.	n.a.	50.0%	74.3%	71.4%	72.3% (2018 Q1)
6 House price growth[o]	1.8%	2.2%	-5.6%	7.0%	-0.1%	0.0% (May 2018)
7 House price to household disposable income ratio[p]	2.9	4.4	2.1	4.7	4.4	4.5 (2017 Q4)
8 Rental yield[q]	5.8%	5.1%	4.8%	7.6%	4.8%	4.8% (May 2018)
9 Spreads on new residential mortgage lending						
All residential mortgages[r]	80 bps	50 bps	35 bps	379 bps	162 bps	105 bps (Apr. 2018)
Difference between the spread on high and low LTV residential mortgage lending[r]	18 bps	25 bps	1 bps	293 bps	107 bps	66 bps (Apr. 2018)
Buy-to-let mortgages[s]	n.a.	n.a.	61 bps	397 bps	253 bps	185 bps (2018 Q1)

(a) A spreadsheet of the series shown in this table is available at www.bankofengland.co.uk/financial-stability.
(b) If the series start after 1987, the average between the start date and 2006 end and the maximum/minimum since the start date are used.
(c) 2006 was the last year before the global financial crisis.
(d) Mean LTV (respectively LTI) ratio on new advances above the median LTV (LTI) ratio, based on loans to first-time buyers, council/registered social tenants exercising their right to buy and homemovers, and excluding lifetime mortgages and advances with LTV ratio above 130% (LTI above 10x). FCA Product Sales Data includes regulated mortgage contracts only. Series starts in 2005. Sources: FCA Product Sales Data and Bank calculations.
(e) From 2017 Q3, mean LTV ratio is calculated on a value-weighted basis, using market-wide buy-to-let loan-level data submissions to the Bank of England, including further advances and remortgages. Prior to 2017 Q3, 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 are categorical: the share of mortgages with LTV ratio less than 75%; between 75% and 90%; between 90% and 95%; and greater than 95%. An approximate mean is calculated by giving these categories weights using the average LTV in equivalent buckets in loan-level buy-to-let data gathered by UK Finance. Series starts in 2007. UK Finance data available from 2014; weights prior to this date are average LTVs across the respective buckets using all data gathered in 2014. The share of mortgages with LTV ratio at 75% from 2014 until 2017 Q2 used are adjusted to estimate the LTV of each loan before any fees or charges are added. This approximates the LTV at which the loan was originated.
(f) The twelve-month growth rate of nominal credit. Defined as the four-quarter cumulative net flow of credit divided by the stock of credit twelve months ago. Credit is defined as all liabilities of the household and not-for-profit sector except for the unfunded pension liabilities and financial derivatives of the not-for-profit sector. Sources: ONS and Bank calculations.
(g) Gross debt as a percentage of a four-quarter moving sum of 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 gross disposable income of the UK household and non-profit sector. Disposable income is adjusted for FISIM and changes in pension entitlements. Sources: ONS and Bank calculations.
(i) Total debt associated with owner-occupier mortgages divided by the four-quarter moving sum of gross disposable income of the UK household and non-profit sector. Disposable income is adjusted for FISIM and changes in pension entitlements. Owner-occupier mortgage debt estimated by multiplying aggregate household debt secured on dwellings by the share of mortgages on lender balances that are not buy-to-let loans. Series starts in 1999. Sources: ONS, UK Finance 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: HMRC, UK Finance 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 UK Finance switches source. Data prior to 2002 are at a quarterly frequency. Sources: UK Finance 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 UK Finance switches source. Data prior to 2002 are at a quarterly frequency. Sources: UK Finance and Bank calculations.
(n) The share of non-regulated mortgages that are interest only. The data include all mortgages, not just those for house purchase. Interest-only mortgages exclude mixed capital and interest mortgages. Sources: Bank of England and Bank calculations.
(o) House prices are calculated as the mean of the average UK house price as reported in the Halifax and Nationwide house price indices. Growth rate calculated as the percentage change three months on three months earlier. Series starts in 1991. Seasonally adjusted. Sources: Halifax/Markit, Nationwide and Bank calculations.
(p) The ratio is calculated using a four-quarter moving sum of gross disposable income of the UK household and non-profit sector per household as the denominator. Disposable income is adjusted for FISIM and changes in pension entitlements. Historical UK household population estimated using annual GB data assuming linear growth in the Northern Ireland household population between available data points. Series starts in 1990. Sources: Department for Communities and Local Government, Halifax/Markit, Nationwide, ONS and Bank calculations.
(q) Using Association of Residential Letting Agents (ARLA) data up until 2014. From 2015 onwards, the series uses LSL Property Services plc data normalised to the ARLA data over 2008 to 2014, when both series are available. Series starts in 2001. Sources: Association of Residential Letting Agents, LSL Property Services plc and Bank calculations.
(r) The overall spread on residential mortgage lending is a weighted average of quoted mortgage rates over risk-free rates, using 90% LTV two-year fixed-rate mortgages and 75% LTV tracker, two and five-year fixed-rate mortgages. Spreads are taken relative to gilt yields of matching maturity for fixed-rate products. Spreads are taken relative to Bank Rate for the tracker product. Weights are based on relative volumes of new lending. The difference in spread between high and low LTV lending is the rate on 90% LTV two-year fixed-rate mortgages less the 75% LTV two-year fixed-rate. Series starts in 1997. FCA Product Sales Data includes regulated mortgage contracts only. Sources: Bank of England, Bloomberg Finance L.P., FCA Product Sales Data, UK Finance and Bank calculations.
(s) The spread on new buy-to-let mortgages is the weighted average effective spread charged on new floating and fixed-rate non-regulated mortgages over safe rates. Spreads are taken relative to Bank Rate for the floating-rate products. The safe rate for fixed-rate mortgages is calculated by weighting two-year, three-year and five-year gilts by the number of buy-to-let fixed-rate mortgage products offered at these maturities. Series starts in 2007. Sources: Bank of England, Bloomberg Finance L.P., Moneyfacts and Bank calculations.

Box 6
The FPC's core indicators

The FPC's core indicators provide information about risks to, and vulnerabilities in, the financial system. The indicators are those that have been helpful in identifying emerging risks to financial stability in the past, and the FPC routinely reviews them to inform its discussions. These indicators are only a subset of the wide range of economic and financial indicators, and the wealth of supervisory and market intelligence, that support the FPC's assessment of the risk environment. Moreover, judgement plays a material role in all FPC decisions and policy is not mechanically tied to any specific set of indicators.

The FPC has published core indicators in the *Financial Stability Report* (*FSR*) since 2013, and on the Bank of England's website on a quarterly basis. Currently three sets of indicators are published. Each set corresponds to one of the FPC's powers in respect of: the countercyclical capital buffer (CCyB) and leverage requirements; sectoral capital requirements (SCR); and housing policy tools.

The FPC has decided to alter the frequency with which some core indicators will be published in future. The CCyB indicators will continue to be published every quarter.(1) Core indicators informing the SCR and housing policy tools will now be published biannually alongside the *FSR* release.

This amended publication schedule is designed to align more closely with the frequency with which the FPC considers the setting of each policy tool. For example the FPC has a statutory responsibility to assess and set the UK CCyB rate quarterly, whereas the setting of other tools is determined by developments in the risk environment.

It will also provide additional resource that will allow the FPC to review and update its set of core indicators. In doing so, the FPC will draw on the evolution of the financial system, improvements in data availability and quality, and new research.

The core indicators will continue to be published in the *FSR* and on the Bank's website. This will complement the detailed information in the *FSR* and Records of meetings that explain FPC decisions.

(1) The FPC will append three indicators that measure potential overvaluation of property prices to its CCyB indicators, in line with a Recommendation from the European Systemic Risk Board (Recommendation 2014/1). This recommends that national authorities take account of and publish a number of variables that indicate the build-up of cyclical systemic risk to inform the setting of the UK CCyB rate.

Glossary and other information

Glossary of selected data and instruments

CDS – credit default swap.
GDP – gross domestic product.
Libor – London interbank offered rate.
OIS – overnight index swap.
RPI – retail prices index.
SOFR – secured overnight financing rate.
SONIA – sterling overnight index average.

Abbreviations

ACS – annual cyclical scenario.
AT1 – additional Tier 1.
BCBS – Basel Committee on Banking Supervision.
BIS – Bank for International Settlements.
CCLB – countercyclical leverage buffer.
CCP – central counterparty.
CCyB – countercyclical capital buffer.
CEIC – CEIC Data Company Ltd.
CET1 – common equity Tier 1.
CGFS – Committee on the Global Financial System.
CLO – collateralised loan obligation.
CRD IV – Capital Requirements Directive.
CRE – commercial real estate.
CRR – Capital Requirements Regulation.
DSR – debt-servicing ratio.
DTI – debt to income.
EBITDA – earnings before interest, tax, depreciation and amortisation.
ECB – European Central Bank.
EEA – European Economic Area.
EME – emerging market economy.
ESMA – European Securities and Markets Authority.
ESRB – European Systemic Risk Board.
EU – European Union.
FCA – Financial Conduct Authority.
FDI – foreign direct investment.
FISIM – financial intermediation services indirectly measured.
FPC – Financial Policy Committee.
FSA – Financial Services Authority.
FSB – Financial Stability Board.
FSR – Financial Stability Report.
FTSE – Financial Times Stock Exchange.
G7 – Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.
G20 – The Group of Twenty Finance Ministers and Central Bank Governors.
GNE – gross notional exposure.
G-SII – global systemically important institution.
HKMA – Hong Kong Monetary Authority.
HMRC – Her Majesty's Revenue and Customs.
ICE/BofAML – Intercontinental Exchange/Bank of America Merrill Lynch.
IFRS – International Financial Reporting Standard.
IMF – International Monetary Fund.
IOSCO – International Organization of Securities Commissions.
IRB – internal ratings based.
LCD – Leveraged Commentary & Data.
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.
MiFID – Markets in Financial Instruments Directive.
MiFIR – Markets in Financial Instruments Regulation.
MREL – minimum requirement for own funds and eligible liabilities.
MSCI – Morgan Stanley Capital International Inc.
NBFI – non-bank financial institution.
NPISH – non-profit institutions serving households.
NSFR – Net Stable Funding Ratio.
ONS – Office for National Statistics.
OTC – over the counter.
PNFC – private non-financial corporation.
PRA – Prudential Regulation Authority.
PRC – Prudential Regulation Committee.
P2P – peer to peer.
RBS – Royal Bank of Scotland.
RoE – return on equity.
RWA – risk-weighted asset.
SCR – sectoral capital requirements.
SME – small and medium-sized enterprise.
S&P – Standard & Poor's.
TSF – total social financing.
WEO – IMF *World Economic Outlook*.