November 2016

The Financial Policy Committee's powers over housing policy instruments

A draft Policy Statement

BANK OF ENGLAND

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

The legislation requires the FPC to prepare and maintain a written statement of the general policy that it proposes to follow in relation to the exercise of its powers of Direction. In April 2015, Her Majesty's Government gave the FPC powers of Direction over the Prudential Regulation Authority (PRA) and Financial Conduct Authority (FCA) in relation to loan to value and debt to income limits in respect of owner-occupied lending. This decision followed Recommendations by the FPC, made in September 2014, in response to a request from the Chancellor. In July 2015, the FPC published its Policy Statement on its powers over housing policy instruments, to meet the legislative requirement to prepare a written statement with regard to the FPC's Direction powers over these housing policy instruments.

In December 2015, Her Majesty's Government consulted on its intention to take forward legislation to grant the FPC new powers of Direction over the PRA and FCA in relation to loan to value and interest coverage ratio limits in respect of buy-to-let lending. The FPC is publishing this update of its Policy Statement, with material covering these proposed new powers, in draft form, in time to be considered alongside Parliament's scrutiny of the associated secondary legislation.

The Financial Policy Committee:[1]
Mark Carney, Governor
Jon Cunliffe, Deputy Governor responsible for financial stability
Ben Broadbent, Deputy Governor responsible for monetary policy
Sam Woods, Deputy Governor responsible for prudential regulation
Nemat Shafik, Deputy Governor responsible for markets and banking
Andrew Bailey, Chief Executive of the Financial Conduct Authority
Alex Brazier, Executive Director for Financial Stability Strategy and Risk
Anil Kashyap[2]
Donald Kohn
Richard Sharp
Martin Taylor
Charles Roxburgh attends as the Treasury member in a non-voting capacity.

This document was finalised on 30 September 2016 and, unless otherwise stated, uses data available as at 30 June 2016.

(1) Clara Furse was also a member of the Committee when the text of this document was finalised. She left the Committee before the document was published.
(2) Note that Anil Kashyap joined the Committee on 1 October 2016, after the text of this document was finalised.

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Executive summary

In June 2014, the Chancellor of the Exchequer announced his intention to grant the Financial Policy Committee (FPC) additional powers to guard against financial stability risks arising from the housing market. He asked the FPC to consider the appropriate form of such powers. In response, the FPC recommended in September 2014 that HM Treasury exercise its statutory power to enable the FPC to direct, if necessary to protect and enhance financial stability, the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) to require regulated lenders to place limits on residential mortgage lending, both owner-occupied and buy-to-let, by reference to:

(a) Loan to value (LTV) ratios: the ratio of the value of a mortgage to the value of the property against which it is secured;

(b) Debt to income (DTI) ratios, including interest coverage ratios (ICRs) in respect of buy-to-let lending. The DTI ratio is the ratio of a borrower's outstanding debt to his or her annual income, and the ICR is the ratio of expected rental income from a buy-to-let property to the estimated mortgage interest payments over a given period of time.

As a result the Government has given the FPC powers of Direction on LTV and DTI limits in respect of owner-occupied lending. It has also prepared draft secondary legislation to give powers of Direction to the FPC in respect of LTV and ICR limits on buy-to-let lending.

For any power of Direction given to the FPC, there is a statutory requirement for the FPC to prepare and maintain a general statement of policy. These 'Policy Statements' are designed to set out publicly the general policy that the FPC proposes to follow in using its powers of Direction. In July 2015, the FPC published a Policy Statement on LTV and DTI limits for the owner-occupier mortgage market.[(1)] This document is a draft update to that Policy Statement, which has been expanded to include material on the FPC's proposed powers in relation to LTV and ICR limits for the buy-to-let mortgage market.

This draft Policy Statement follows the structure and coverage of the FPC's existing Policy Statement on its powers over housing policy instruments. It describes the housing policy instruments and the proposed scope of their coverage, the FPC's current view of the possible impact of the policy instruments on financial stability and growth, and the indicators that the FPC will look at, among other information, in making its judgement on when to use the policy instruments.

The FPC and its regulatory powers

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

(1) See Bank of England (2015a).

The FPC has two main powers under the Bank of England Act 1998 (as amended). It can make Recommendations to anybody, including to the PRA and FCA. It can also give Directions to those regulators to implement a specific measure to further the FPC's objectives. In April 2013, the Government gave the FPC a Direction power over sectoral capital requirements (SCRs), which enables the FPC to change capital requirements on exposures of banks to specific sectors that are judged to pose a risk to the stability of the financial system as a whole. The FPC has also been made responsible for decisions on the countercyclical capital buffer (CCyB), which allows the FPC to change capital requirements over and above normal microprudential standards on all loans and exposures of banks to borrowers in the United Kingdom. The Government has also given the FPC powers of Direction over leverage ratio requirements and buffers. Separate Policy Statements discuss these powers.[1]

The limits on LTV and DTI ratios in the owner-occupier mortgage market described in this Policy Statement enable the FPC to require the PRA and FCA to restrict the proportion of new mortgages that lenders could extend above a certain LTV or DTI ratio when it judged that doing so would address risks to financial stability from the housing market. The proposed powers of Direction over LTV and ICR limits on buy-to-let lending would address risks arising from the buy-to-let market. These limits would apply to all PRA and FCA-authorised lenders providing mortgages and would complement the FPC's existing powers over capital requirements. In using these policy instruments, the FPC expects to cooperate closely with relevant overseas regulators to ensure that macroprudential policy decisions are implemented effectively.

There are clear benefits, in terms of implementation and accountability, to being able to use a power of Direction over housing policy instruments, even though the FPC also has a power to make Recommendations to the FCA and PRA. First, implementation of Directions may be more timely than for Recommendations. This is important for LTV, DTI and ICR limits because delayed implementation may lead to an adverse outcome in which activity is brought forward. Second, Directions are used within a clear framework, with a strong macroprudential mandate for varying policies over the cycle. As noted above, the FPC is required to produce and maintain a Policy Statement for each power of Direction, enhancing transparency of the policymaking process. This does not preclude the possibility that the FPC, on occasion, may prefer to recommend a change in such policy instruments rather than issue a Direction.

As noted above the purpose of this draft update to the FPC's existing Policy Statement is to include additional material relevant to the FPC's proposed policy instruments for the buy-to-let mortgage market. That material is necessarily in draft form because the legislation to provide these powers has not yet been finalised. But the FPC is publishing this draft update to its Policy Statement now to inform the Parliamentary debate of the proposed legislation necessary to establish these powers. As set out in its Recommendation from September 2014, the FPC's view is that any powers over the housing market should be able to be applied both to owner-occupied and buy-to-let mortgage lending because the underlying housing assets are the same. Ensuring that macroprudential policies could be applied, when necessary and appropriate, to both sectors would also be consistent with existing macroprudential powers over capital and the practice seen so far by authorities in other countries targeting properties other than the mortgagee's main residence, including buy-to-let properties.

Rationale for and possible impact of the housing policy instruments

In the past, upswings in the housing market have often been followed by periods of financial instability.[2] Across countries, more than two thirds of the 46 systemic banking crises for which house price data are available were preceded by housing boom-bust cycles.[3] There is evidence that housing policy instruments such as LTV, DTI and ICR limits may help contain risks from the housing market. The policy instruments work through a number of channels.

The LTV instrument operates by placing limits on the proportion of relevant mortgages that can be extended at high LTV ratios, which can protect lenders' capital by reducing potential losses in the event that high LTV borrowers default on their

(1) See Bank of England (2014a), Bank of England (2015b) and Bank of England (2016a).

(2) See Jordà, Schularick and Taylor (2014).
(3) See Crowe at al (2011).

mortgages and property values have declined. In the event of default lenders are more likely to face losses on mortgage loans where there is a lower proportion of borrower equity; and higher LTV loans tend to be associated with higher borrower default rates.

The DTI instrument operates by placing limits on the proportion of mortgages that can be extended at high DTI ratios. This can enhance financial stability by limiting household indebtedness. An increase in the number of highly indebted households can pose a risk to the financial system directly if an unexpected fall in income or a change in interest rates means more borrowers become unable to service their debts and default on their mortgage, or indirectly if, in order to continue servicing their debts, households reduce consumption and therefore put downward pressure on wider economic activity. A given economic shock tends to have a more pronounced effect on output and employment in highly indebted countries than in others.(1)

The ICR instrument would operate by limiting the proportion of buy-to-let mortgages that can be extended below the specified ICR threshold. This can enhance financial stability by making buy-to-let borrowers less vulnerable to potential future rises in interest rates and/or declining rental incomes. Reducing this vulnerability may lower the probability that buy-to-let investors will struggle to meet loan repayments. This in turn may reduce the probability that buy-to-let borrowers would default on the loans (impacting on banks' balance sheets); be forced to cut consumption (putting downward pressure on wider economic activity); or sell the property (contributing to the amplification of house price cycles).

All instruments may also help moderate amplification channels between mortgage lending, expectations of future house price increases and the housing market. Self-reinforcing loops between mortgage lending and house prices may emerge because of the role of housing assets as collateral. As valuations increase, rising wealth for existing homeowners and higher collateral values for lenders can increase both the demand for and supply of credit, feeding back into higher valuations. Expectations of future price increases may bolster this channel, prompting potential buyers to seek to purchase housing assets sooner rather than later.

LTV, DTI and ICR limits could in some circumstances affect the path of economic activity by reducing the supply of lending to households. Clearly, the impact of any particular measure will depend on its calibration and on the prevailing market conditions. The FPC's first actions in the owner-occupied mortgage market were designed and calibrated to provide insurance against the risk of a marked loosening in underwriting standards and a further significant rise in the number of highly indebted households.(2) As such they were not expected to have a material impact on mortgage lending and housing transactions in the near-term. In the medium to long term, where policy instruments are successful in reducing the likelihood and severity of financial crises and in making the real economy more resilient to shocks by restraining indebtedness, their use is likely to increase the expected level of UK GDP.

The use of these policy instruments might create incentives for activity to migrate into lending not subject to this macroprudential regulation, for example cross-border lending or some forms of unsecured lending. The FPC would monitor the extent to which such 'leakages' reduce its ability to mitigate systemic risks and, if necessary, would make Recommendations to HM Treasury to expand the set of institutions to which these policy instruments apply.

Considerations on how to use the housing policy instruments

Many indicators will be useful for shaping the decisions of the FPC on these housing policy instruments and helping it to explain those decisions publicly. While no single set of indicators can ever provide a perfect guide to systemic risks from the housing market, the FPC will routinely review a set of core indicators which have been helpful in identifying emerging risks to financial stability from the housing

(1) See Flodén (2014).

(2) In June 2014, before the FPC was granted powers of Direction over the owner-occupier mortgage market, the FPC issued the following Recommendations: (i) when assessing affordability, mortgage lenders should apply an interest rate stress test that assesses whether borrowers could still afford their mortgages if, at any point over the first five years of the loan, Bank Rate were to be 3 percentage points higher than the prevailing rate at origination; and (ii) the PRA and the FCA should ensure that mortgage lenders limit the proportion of mortgages at loan to income multiples of 4.5 and above to no more than 15% of their new mortgages. See Bank of England (2014b).

market in the past.

The indicators will be considered alongside those for the CCyB and SCRs, market and supervisory intelligence, and 'stress tests' to judge which of the FPC's policy instruments — including existing capital instruments or these housing policy instruments — might be most appropriate in response to risks stemming from a particular sector of the economy or in aggregate.

The core indicators suggested for LTV, DTI and ICR limits include measures of lender and household balance sheet stretch and measures of conditions and terms in the housing market and are listed in **Table A** on page 45. Since instability often follows periods of rapid change in the financial system, it will be important to consider significant changes in indicators alongside their absolute level.

The FPC will be more likely to adjust LTV, DTI or ICR limits when the degree of imbalance as measured by the core indicators is greater, when the different indicators convey a more uniform picture, and when that picture is supported by market and supervisory intelligence. Judgement will, however, play a material role in all FPC decisions and policy will not be mechanically tied to any specific set of indicators. The indicators may also be useful in judging whether or not policy has been effective.

The FPC would tighten LTV, DTI or ICR limits when threats to financial stability emerge from the UK housing market. The limits would be loosened or removed when such threats have receded. Limits would not be activated when the FPC judges that current and future threats to resilience are low.

The core indicators are published alongside the wider information set informing the FPC's decisions in its *Financial Stability Report* every six months.

1 Introduction

The Financial Services Act 2012 introduced legislation to create the FPC. The FPC's statutory responsibility is the '*identification of, monitoring of, and taking of action to remove or reduce systemic risks with a view to protecting and enhancing the resilience of the UK financial system*', with the objective of contributing towards the Bank's Financial Stability Objective. Systemic risks include those attributable to '*structural features of financial markets, such as connections between financial institutions*', to '*the distribution of risk within the financial sector*' and to '*unsustainable levels of leverage, debt or credit growth*'.

The FPC's task is not to achieve resilience at any cost, however. Its actions must not, in the provisions of the legislation, have '*a significant adverse effect on the capacity of the financial sector to contribute to the growth of the UK economy in the medium or long term*'. The legislation provides that, subject to achieving its primary objective, the FPC must also support '*the economic policy of Her Majesty's Government, including its objectives for growth and employment*'.[(1)]

When making macroprudential policy decisions, the FPC must have regard to '*the principle that a burden or restriction which is imposed on a person, or the carrying on of an activity, should be proportionate to the benefits, considered in general terms, which are expected to result from the imposition of that burden or restriction*'. Furthermore, in accordance with its statutory objectives, the FPC would need to prepare an explanation of the reason for its decision, as well as an estimate of the costs and benefits unless it was not reasonably practicable to do so.

The FPC has two main sets of powers at its disposal under the Bank of England Act 1998 (as amended). The first is a power to make *Recommendations*. It can make Recommendations to anybody, including to the PRA and the FCA about the exercise of their functions, such as to adjust the rules that banks and other regulated financial institutions must abide by. This document is not about this first set of powers.

The second set of powers is to give *Directions* to those regulators to implement a specific measure to further the FPC's objectives. In April 2013, the Government gave the FPC Direction power over SCRs and in May 2014 made the FPC responsible for policy decisions on the CCyB in the United Kingdom. The Government has also given the FPC powers of Direction over leverage ratio requirements and buffers.[(2)]

In June 2014, the Chancellor of the Exchequer announced his intention to grant the FPC additional powers to guard against financial stability risks arising from the housing market.[(3)] He asked the FPC to consider the appropriate form of such powers. The interim FPC had noted in March 2012 that LTV and loan to income (LTI) limits might be useful but that further debate and analysis were necessary to support powers of Direction.

In response to the Chancellor, the FPC recommended in September 2014 that HM Treasury exercise its statutory power to enable the FPC to direct, if necessary to protect and enhance financial stability, the PRA and FCA to require regulated lenders to place limits on residential mortgage lending, both owner-occupied and buy-to-let, by reference to:[(4)]

(a) LTV ratios: the ratio of the value of a mortgage to the value of the property against which it is secured;

(b) DTI ratios, including ICRs in respect of buy-to-let lending. The DTI ratio is the ratio of a borrower's outstanding debt to his or her annual income, and the ICR is the ratio of expected rental income from a buy-to-let property to the estimated mortgage interest payments over a given period of time.

As a result, the Government gave powers of Direction to the FPC in respect of LTV and DTI limits on owner-occupied lending. The Government has also prepared draft secondary legislation to give powers of Direction to the FPC in respect of LTV and ICR limits on buy-to-let lending.

(1) See Tucker, Hall and Pattani (2013) for more detail on the role of the FPC.

(2) See Bank of England (2014a), Bank of England (2015b) and Bank of England (2016a) for more detail on these policy instruments, including on definitions, scope, impact and indicators.

(3) See June 2014 Mansion House speech, available at www.gov.uk/government/speeches/mansion-house-2014-speech-by-the-chancellor-of-the-exchequer.

(4) See Bank of England (2014c).

The powers of Direction over LTV and DTI ratios in the owner-occupier mortgage market enable the FPC to require the PRA and FCA to restrict lenders[1] from extending new mortgages above certain LTV or DTI ratios when it judged that doing so would address risks to financial stability arising from the housing market. The proposed powers of Direction over LTV and ICR limits on buy-to-let lending would address risks arising from the buy-to-let market. This would be in line with the FPC's objective to remove or reduce systemic risks, including from unsustainable levels of leverage, debt or credit growth, and complement the FPC's existing powers on capital. Importantly, it is not the FPC's role to control house prices, nor can it address underlying structural issues related to the supply of houses.

There are clear benefits, in terms of implementation and accountability, to being able to use a power of Direction over these policy instruments, even though the FPC also has a power to make Recommendations to the FCA and PRA. First, implementation of Directions may be more timely than for Recommendations. This is important for LTV, DTI and ICR limits because delayed implementation may lead to an adverse outcome in which activity is brought forward.[2] Second, Directions are used within a clear framework, with a strong macroprudential mandate for varying policies over the cycle. For each Direction power, the FPC is required to produce and maintain a Policy Statement enhancing transparency of the policymaking process. This does not preclude the possibility that the FPC, on occasion, may prefer to recommend a change in such policy instruments rather than issue a Direction.

These policy instruments complement the FPC's powers to supplement capital requirements, while serving a distinct purpose.

Capital instruments focus on maintaining the resilience of lenders' balance sheets to credit losses, addressing any tendency of lenders with weak capital positions to amplify economic stress by restricting the supply of credit and other essential services.

LTV, DTI and ICR instruments directly address risks stemming from the behaviour and balance sheet positions of borrowers, which can affect not just the resilience of lenders, but also directly amplify the effects of economic stress on growth and employment.

In July 2015, the FPC published its Policy Statement on LTV and DTI limits for the owner-occupier mortgage market which the FPC is required to publish for its Direction powers.[3] As experience of operating the regime grows, the Policy Statement will be reviewed and updated.

This document is a draft update to that Policy Statement, which has been expanded to include material on the FPC's proposed powers in relation to LTV and ICR limits for the buy-to-let mortgage market. That material is necessarily in draft form because the legislation to provide these powers has not yet been finalised. But the FPC is publishing this draft update to its Policy Statement now to inform the Parliamentary debate of the proposed legislation necessary to establish these powers. As set out in its Recommendation in September 2014, the FPC's view is that any powers over the housing market should be able to be applied both to owner-occupied and buy-to-let mortgage lending because the underlying housing assets are the same. Ensuring that macroprudential policies could be applied, when necessary and appropriate, to both sectors would also be consistent with existing macroprudential powers over capital and the practice seen so far by authorities in other countries targeting properties other than the mortgagee's main residence, including buy-to-let properties.

The FPC's framework is in line with the April 2013 Recommendation on intermediate objectives and instruments of macroprudential policy of the European Systemic Risk Board (ESRB). This suggested five intermediate objectives of macroprudential policy relating to: (i) excessive credit growth and leverage; (ii) excessive maturity mismatch and market illiquidity; (iii) direct and indirect exposure concentrations; (iv) misaligned incentives and moral hazard; and (v) financial infrastructures. These are all encompassed by the

(1) In what follows, the term 'lenders' is used to describe the set of firms to which the LTV, DTI and ICR limits would apply — namely all PRA and FCA-authorised firms carrying out relevant mortgage lending. These institutions are defined explicitly in Section 2.3.

(2) Implementation of a Direction may be more timely in the event of a recalibration of an existing Direction as the need to consult would be waived. However, if a Direction requires new rules or amendments to existing rules, the PRA and FCA would need to consult.

(3) See Bank of England (2015a).

FPC's statutory objectives introduced by the Financial Services Act 2012.

The ESRB also recommended that macroprudential authorities should have at least one instrument available to address each of these intermediate objectives. Like the CCyB and SCR instruments, the LTV, DTI and ICR instruments are primarily designed to mitigate cyclical risks from excessive credit growth and leverage, in this case related to housing assets. The FPC's broad Recommendation power gives it instruments to achieve the other intermediate objectives, allowing the FPC flexibility to act as and when it deems necessary subject to the domestic and European Union (EU) legal framework.

This draft Policy Statement follows the structure and coverage of the existing Policy Statement on the FPC's powers over housing policy instruments. Section 2 describes the LTV, DTI and ICR instruments, including how they would be defined, the lenders and mortgages they would apply to, how decisions would be coordinated with overseas regulators, how the policy instruments fit with the rest of the regulatory framework and how decisions would be communicated and enforced. Section 3 sets out the FPC's assessment of how these policy instruments would affect the resilience of the financial system and, given the secondary objective, growth. Section 4 explains the circumstances in which the FPC might expect to adjust the setting of each instrument and provides a list of core indicators that the FPC will routinely review when reaching decisions. Section 5 concludes.

2 Description of the instruments

2.1 What are LTV, DTI and ICR instruments?

Direction powers over LTV ratios, DTI ratios and ICRs enable the FPC to require the PRA and FCA to restrict lenders from extending new mortgages beyond certain limits, when it judges that doing so would address risks to financial stability arising from the housing market.

An LTV instrument operates by placing limits on the proportion of new mortgages that can be extended at high LTV ratios. The LTV ratio is the ratio of the value of a mortgage to the value of a property against which it is secured:

$$\text{LTV} = \frac{\text{Value of mortgage}}{\text{Value of property against which mortgage is secured}}$$

For instance, if a house buyer obtains a mortgage equal to 90% of the purchase price, and puts down a deposit of 10%, the LTV ratio is 90%. Limits to LTV ratios can enhance financial stability by reducing potential losses to lenders in the event that mortgage holders with high LTV mortgages default on their mortgage payments and property prices have declined. In the event of default, lenders are more likely to face losses on high LTV mortgage lending given the lower level of borrower deposit that serves to protect the lender against low sale prices (a higher 'loss given default'). Additionally, higher LTV loans tend to be associated with higher borrower default rates (a higher 'probability of default') (see Section 3.1).

A DTI instrument operates by placing limits on the proportion of new mortgages that can be extended at high DTI ratios. The DTI ratio is the ratio of a borrower's outstanding debt to his or her annual income:

$$\text{DTI} = \frac{\text{Borrower's outstanding debt}}{\text{Borrower's annual income}}$$

For instance, a borrower with a DTI ratio of five has outstanding debt — including the new mortgage loan — of five times their annual income. Limits on DTI ratios can enhance financial stability by limiting household indebtedness. A DTI instrument aims to limit the number of households whose high debt burden would make them more vulnerable to an unexpected fall in income or rise in interest rates. An increase in the proportion of highly indebted households can pose risks to the financial system following a shock to interest rates or income either directly if more borrowers are unable to service their debts and default on their mortgage, or indirectly if, in struggling to service their debts, households reduce consumer spending and therefore put downward pressure on economic activity. International evidence suggests that areas with higher levels of household indebtedness experience more pronounced effects on output and unemployment (see Section 3).

An ICR instrument operates by placing a limit on the proportion of new buy-to-let mortgages that can be extended at a low ICR. The ICR is the ratio of expected rental income from a buy-to-let property to the estimated mortgage interest payments over a given period of time:

$$\text{ICR} = \frac{\text{Expected monthly rental income from buy-to-let property}}{\text{Estimated monthly interest payments at a specified mortgage interest rate}}$$

For instance, a mortgage would have an ICR of 125% if the expected rental income is 25% higher than the estimated interest payments, assuming an appropriate interest rate. The ICR instrument can make the balance sheets of buy-to-let borrowers less vulnerable to potential rises in interest rates and/or declining rental incomes. Reducing this vulnerability may lower the probability that buy-to-let investors will struggle to meet loan repayments. This in turn may reduce the probability that buy-to-let borrowers would default on the loans (impacting on banks' balance sheets); be forced to cut consumption (putting downward pressure on wider economic activity); or sell the property (contributing to the amplification of house price cycles).

In applying its powers, the FPC could direct the PRA and FCA to apply limits based on two parameters: the LTV ratio, DTI ratio or ICR, and the *proportion* of the flow of new mortgages that lenders could extend beyond the instruments' respective limits. At one extreme, if the proportion were set to zero, the instruments would operate as a hard cap where no mortgages with LTV ratios or DTI ratios above, or ICRs below, their respective thresholds at origination could be extended.

The FPC could specify whether the limit on the proportion of lending above a specified LTV or DTI ratio or below a specified ICR applies to the value and/or volume of new mortgages. The calibration of limits would be considered on its merits in each case.

If the financial stability concern was related to direct risks to lenders' balance sheets, then a value measure might be more appropriate as it could set a maximum aggregate exposure to high LTV or DTI lending, or low ICR lending. If the concern was about borrower indebtedness, a volume measure might be more appropriate as it could limit the number of highly indebted borrowers and so potentially moderate the collective reduction in spending during a downturn. In that case, lenders may, however, have an incentive to undertake riskier lending on more expensive properties, for example, those owned or rented by high-income households. If the FPC was concerned that these borrowers might cut back relatively more on consumption in the event of mortgage distress, a value measure could be considered instead. Further, the choice may impact on lenders' business models differently. The FPC would also consider this when deciding on a Direction on LTV, DTI or ICR instruments.

Where an ICR limit is applied, the FPC would also specify the appropriate mortgage interest rate at which the ICR should be calculated. For example, the FPC could require that rental income must be at least 125% of mortgage interest payments when using an interest rate of 5%. This interest rate could be set to account for potential future increases in the overall level of interest rates to reduce the likelihood of a landlord's interest payments from exceeding their rental income in this scenario. In this example, a mortgage would still exceed the ICR of 125% (or 1.25) even if the mortgage interest rate rose to 5%, given the same rental income.

2.2 Definitions for LTV and DTI ratios and ICRs

The loan figure in the LTV ratio would be the total amount outstanding on all mortgage loans to a borrower secured (whether by first or subsequent charge) on the relevant residential property.[(1)] Other borrowings by that owner-occupier or landlord would not be included in the loan figure. The property value is taken to be the value, as assessed by the lender, for the purposes of the new mortgage loan; this will often be the most recent surveyor's valuation used for the purpose of agreeing the mortgage contract.

For the DTI ratio the debt figure would take account of households' contractual, commercially extended mortgage and non-mortgage debt. There are two reasons for defining this measure broadly:

(i) as well as mortgages, other forms of debt, whether secured or unsecured, can put pressure on household finances and therefore affect financial stability via aggregate consumption; and

(ii) international experience suggests that if a limit on DTI ratios only encompasses first-charge mortgages, lending activity can become displaced into other forms of debt, undermining the effectiveness of policies that seek to limit risks to financial stability by affecting indebtedness (see Box 1).

The definition of 'debt' for the DTI instrument therefore includes the following:

- the borrower's outstanding debt on first and subsequent charge owner-occupied mortgages, as well as the new mortgage in question; and

- amounts outstanding on personal loans, overdraft facilities, credit cards and other types of secured and unsecured borrowing, excluding loans from family members and student loans.

Non-contractual personal debts and regular payment arrears (such as utility bill arrears) are outside the scope of the limit. Moreover, student loans supplied by the Government-owned Student Loans Company are not included in the definition of 'debt'.

In setting DTI limits, the FPC would use its judgement to determine the definition of household debt that would be appropriate and proportionate to managing risks at the time the policy was put in place. The FPC may determine that only a subset of the types of debt listed above are relevant for a particular Direction. Or if the FPC were to identify evidence that lending was being displaced into other forms of debt outside the

(1) Section 2.4 sets out the mortgages in scope of the instruments.

scope of this definition, it would be able to use its powers of Recommendation to ask HM Treasury to extend the coverage under the legislation, if necessary.

The FPC would have flexibility in choosing between a definition of income gross or net of tax and national insurance for the DTI limit, where income would be defined with reference to the amount of annual income verified by the lender when deciding to provide credit to the borrower.

An ICR is the ratio of the expected monthly rental income from the buy-to-let property that is the subject of a buy-to-let mortgage contract to the monthly interest payments as estimated by the lender at the time of deciding to provide credit to the borrower. A buy-to-let mortgage contract is a mortgage contract under which at least 40% of the land on which it is secured is (or is intended to be) used as a dwelling other than by the borrower or a person related to them, and which is occupied on the basis of a rental agreement. The FPC would specify an appropriate interest rate at which the ICR would apply. It could, for example, take into account any potential future increases in the interest rate that could put pressure on borrowers at the time of re-financing, and ensure that borrowers could still afford a mortgage if interest rates were to rise in the future.

2.3 To whom would the instruments apply?

The LTV and DTI instruments on new owner-occupied mortgages would apply to all PRA and FCA-authorised firms conducting owner-occupied mortgage lending. The LTV and ICR instruments on buy-to-let mortgages would similarly apply to PRA and FCA-authorised firms conducting buy-to-let lending. When implemented through prudential requirements, this would include mortgage lending by overseas lenders' UK subsidiaries and branches regulated by the PRA, but exclude European Economic Area (EEA) branches conducting mortgage lending through EEA passporting rights, unless the measures were reciprocated by the relevant foreign authorities (see Section 2.5).

The instruments may be applied at the level of individual regulated entities or so that regulated entities in the same group are treated together. The FPC would have discretion to apply exclusions to certain types of mortgages or lenders, or give discretion to the PRA or FCA to apply exclusions. For example, the FPC could apply a *de minimis* threshold to LTV, DTI or ICR limits as it did in its June 2014 Recommendation on lending at high LTI ratios,[1] if its analysis showed that the risks to financial stability from certain types of firms was unlikely to be systemic, or certain firms would be disproportionately affected.

Because no other financial services firms would be covered by these housing instruments, there is a risk of creating incentives for activity to migrate to lending not subject to this macroprudential regulation, for example cross-border[2] or some forms of unsecured lending. The FPC would monitor the extent to which any such leakages reduce its ability to mitigate systemic risks and, if it believed necessary, would make Recommendations to HM Treasury to expand the set of institutions or lending to which these instruments apply.

2.4 To which mortgages would the instruments apply?

The LTV, DTI and ICR instruments would apply to new mortgages at the point of origination. The limits could be applied to first and/or subsequent charge mortgages.[3] It is irrelevant whether the lender at the point of origination will continue to hold the mortgage or will transfer or dispose of the asset.

In the context of owner-occupied mortgage lending, business loans secured on residential property[4] and remortgages where there is no increase in principal are excluded. The legislation also excludes secured lending to consumers by the Government (including local government and housing associations), provided that: the loan is free of interest or at lower borrowing rates than those available on the market, or on other terms more favourable to the consumer than the market would be able to provide; and there are eligibility criteria to access the loan.

With regard to buy-to-let mortgages, the proposed instruments would not apply to lending for the

(1) Exemptions from the instruments apply if the total size of a lender's mortgage portfolio in value or volume terms falls below the *de minimis* threshold.
(2) Cross-border lending in this context refers to UK lending by firms not domiciled in the UK.
(3) The United Kingdom's implementation of the EU's Mortgage Credit Directive brought second and subsequent charge mortgages within the definition of a 'regulated mortgage contract' from 21 March 2016.
(4) Loans taken out by a borrower for the purposes of a business carried on by them and secured on their home.

purposes of constructing new buildings on land that will be used for dwellings and where there are currently no dwellings.

The FPC will keep under review excluded mortgages and may take further action if it considered that the objectives of the instruments were undermined.

2.5 How would decisions on the instruments be coordinated with overseas regulators?

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

These instruments would, however, not be formally subject to joint-decision processes with overseas regulators. The FPC would generally notify the ESRB when a macroprudential measure is adopted. The PRA would similarly notify the European Banking Authority when a macroprudential measure is applied under Pillar 2 as required by the Capital Requirements Regulation. The FPC could ask other EU Member States and their competent authorities, whether bilaterally or through the ESRB framework on voluntary reciprocity, to reciprocate the measure if their institutions conduct significant mortgage lending in the United Kingdom.

2.6 How do these instruments fit with the rest of the regulatory framework?

These Direction powers would be used to further the achievement of the FPC's objectives. While the instruments would interact with other macroprudential instruments, as well as microprudential and conduct instruments, they serve a distinct purpose.

In exercising its functions, the FPC would have regard to the wider regulatory environment and market conditions in which these instruments may be applied. The FPC will aim for consistency with the PRA's and FCA's rules and guidance where possible to maintain the link between macroprudential, microprudential and conduct requirements and to minimise the additional burden on lenders.

The FPC's powers of Direction over housing instruments complement its other powers over macroprudential instruments, namely its power to set the CCyB rate and its Direction powers over SCRs. Macroprudential capital instruments are used to reinforce the resilience of the banking system where appropriate to align it with the risk of loss on exposures (after taking account of provisions held).

The FPC has published a Policy Statement on its approach to setting the CCyB.[(1)] This acknowledges that while the CCyB might be used to restrain credit growth, this is not its primary objective in the framework, and other macroprudential instruments are likely to be more appropriate to address excessive growth of credit or other heightened risks.

The power to direct the PRA to increase or revoke SCRs could address the direct credit risk stemming from more narrowly defined exposures, such as buy-to-let or owner-occupier mortgage lending, by ensuring lenders hold higher capital against these particular exposures. But, as both the CCyB and SCRs focus only on the resilience of lenders' balance sheets rather than borrowers' balance sheets, they would be less effective at addressing risks from the indebtedness channel, which operates via borrowers' behaviour (see Section 3.2).

To address the risk that high levels of indebtedness could amplify economic shocks, housing instruments are needed to complement the FPC's powers over capital requirements. The use of housing instruments can directly affect the riskiness of mortgages being extended, and so potentially reduce the need to deploy capital instruments to support lender resilience.

Additionally, the FPC has the power to make Recommendations to tackle financial stability risks. For example, the FPC's policy action to limit the proportion of lending at high LTI ratios in June 2014 was achieved through a Recommendation to the PRA and FCA. The FPC could also make other Recommendations if necessary to target different risks from the housing market that may emerge, though as discussed in the Introduction,

(1) See Bank of England (2016a).

there are advantages to acting through powers of Direction when possible.

The FPC's powers over housing policy instruments also complement the PRA's role in promoting the safety and soundness of firms. The PRA has published a Supervisory Statement on underwriting standards for buy-to-let mortgage contracts.[1] The Statement proposes a set of expectations for firms that underwrite UK buy-to-let mortgage contracts, which are relevant to all firms regulated by the PRA that undertake buy-to-let lending that is not already subject to FCA regulation, including firms in groups with a PRA-regulated parent. The PRA's expectations are set to ensure the safety and soundness of individual lenders by ensuring sound underwriting standards for buy-to-let mortgage lending. The FPC's ICR instrument would complement the PRA's expectation from a system-wide perspective, reflecting the FPC's focus on ensuring the stability of the financial sector as a whole.

There is also some interaction between the FPC's powers of Direction over housing and the FCA's conduct regulation, though each serves a distinct purpose. The FCA's mortgage affordability rules, which were strengthened through the Mortgage Market Review (MMR), continue to be the conduct requirements for lenders when undertaking regulated mortgage lending. The FCA's mortgage affordability rules are intended to ensure that lenders take into account whether a borrower can afford a mortgage when making individual lending decisions. For example, they already require lenders that provide regulated mortgage contracts (ie first and subsequent charge lending to owner-occupiers) to take into account the borrower's other credit commitments (including unsecured loans and credit cards) in the affordability assessment. The FPC's housing policy instruments are concerned with mortgage losses and over-indebtedness in the economy as a whole: a DTI limit directed by the FPC would act in addition to the affordability assessment and target household debt burdens on a system-wide basis rather than pure affordability on an individual basis.

2.7 How would the FPC's decisions on the housing instruments be communicated and enforced?

The FPC's policy decisions — and the text of any Directions given to the PRA and FCA — would be published at the latest in the quarterly FPC Record following its policy meetings. The FPC Record would include a summary of the Committee's deliberations in reaching its policy decisions. The FPC would typically also publish an FPC Statement prior to this which summarised the policy decisions. The FPC would explain the background to those decisions in more detail in its six-monthly *Financial Stability Report*, including an estimate of the costs and benefits of its actions, unless in its opinion such an assessment was not reasonably practicable. As discussed in Section 4, the FPC will monitor a set of core indicators for the LTV, DTI and ICR measures, alongside a broader information set. The FPC's Directions and a copy of each *Financial Stability Report* would also be laid before Parliament by HM Treasury. The FPC has a statutory duty to review any Directions in force at least every twelve months starting with the day the Direction was given. The purpose of these reviews is to consider whether a Direction ought to be revoked or otherwise changed. In making a decision, the FPC would consider how risks have evolved against, among other things, its indicators and the initial impact assessment, and would form a view on the potential impact of any such change.

The PRA and FCA must implement Directions by the FPC as soon as reasonably practicable, provided it is in their legal power to do so. The FPC recognises that the implementation time would depend on a number of factors, including providing lenders with a reasonable time to comply, any procedural requirements that apply to the PRA and FCA, and the implementation approach chosen. Occasionally, it may be important for a Direction to be implemented quickly to increase its effectiveness — for instance, when delayed implementation is judged to lead to an adverse outcome because activity is expected to be brought forward. The FPC may issue a Recommendation on the timing of implementation alongside its Direction, which it can choose to make subject to a duty for the PRA or FCA to 'comply or explain'.

(1) See Prudential Regulation Authority (2016).

The PRA expects to communicate on the framework for implementing FPC Directions on LTV, DTI and ICR limits. The PRA would normally also consult when implementing an FPC Direction. The PRA would explain to lenders the approach to implementing Directions on LTV, DTI and ICR limits. In the event of a recalibration of an existing Direction, the need to consult is disapplied in the legislation. The PRA would expect to use its statutory powers to enforce breaches in the same way as for other regulatory breaches.

The PRA and FCA will evaluate the potential impact expected from the scope of any FPC Direction on housing, including any *de minimis* threshold and other exclusions, in considering the most proportionate approach to giving it effect.

3 Impact of the housing policy instruments on financial stability and growth

Imposing limits on LTV ratios, DTI ratios or ICRs enhances the resilience of the financial system against risks that arise from the housing market via different channels. This section considers the impact of activating these instruments. The key transmission channels are illustrated in **Figure 1**.

A tighter setting of any instrument would lead to changes in the mortgage and housing markets which can affect both lender and borrower balance sheets. Lenders with a less risky mortgage portfolio are less vulnerable to credit losses (Section 3.1). And borrowers with lower debts relative to income and rent are less exposed to unexpected changes to these variables or interest rates (Section 3.2). With more resilient balance sheets in both sectors, there would likely be less need to cut back on credit extension or consumption in response to shocks. Self-reinforcing loops, or amplification channels, between mortgage lending, expectations and the housing market, and the risks to balance sheets they can generate, might also be moderated by use of the housing instruments (Section 3.3). By moderating risks from the housing market, these instruments should therefore reduce the likelihood and severity of financial crises and increase the expected level of UK GDP in the medium to long term.

In the short run, a tighter setting of these instruments would affect the quantity and distribution of mortgage lending and the expectations of market participants. That might lead to lower activity in the housing market, with a commensurate impact on GDP (Section 3.4).

The immediate effect of the instruments only applies to lenders and lending within the scope of LTV, DTI and ICR limits as discussed in Section 2, and so the impact in practice of the instruments would depend on the extent of any leakage. The FPC would monitor whether substitution towards lending not included in the scope of a Direction was leading to the policy action being less effective at mitigating risks to financial stability than intended. This could potentially include substitution between the owner-occupier and buy-to-let markets, substitution to unsecured forms of credit if borrowers opt to improve or extend existing homes rather than move, or substitution towards the unregulated sub-sector of the buy-to-let market and non-traditional sources of lending such as peer-to-peer. Box 1 on the international experience with housing instruments gives some examples of leakage seen in other countries.

3.1 Impact on financial stability via lender balance sheets

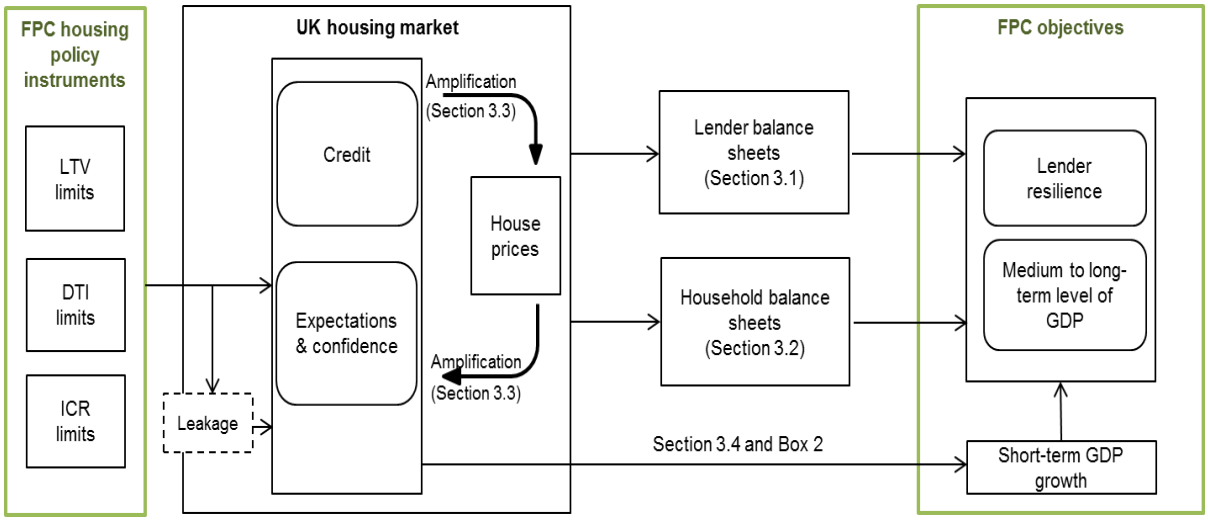
LTV, DTI and ICR limits can directly affect the credit risk to which lenders are exposed through their impact on the volume, value and distribution of mortgage lending. This is illustrated in **Figure 1** with arrows linking the impact of the instruments on the housing market to lender balance sheets. Since mortgage lending is the single largest asset class on lender balance sheets and a common exposure across the system, these limits can enhance the resilience of the financial system.

Evidence for the United Kingdom shows that high LTV mortgages have higher default rates. A study by the Central Bank of Ireland (CBI) on UK mortgages found that in the 2009-13 period a one percentage point increase in LTV led to a one percent increase in the probability that a mortgage defaulted, and that this relationship was considerably stronger for buy-to-let loans than for loans to owner-occupiers.[(1)] Across large lenders in recent years, mortgages with an LTV above 90% at origination have been four times more likely to be in arrears than those with an LTV below 90%. And evidence from the MMR supports a positive correlation between original LTV and defaults.[(2)(3)] For mortgages to buy-to-let investors internal Bank of England data show that, at end-2014, 4% of buy-to-let mortgages on the books of the six largest mortgage lenders with a current LTV ratio above 80% were in arrears of more than three months' payments, compared to 0.6% of mortgages with an LTV ratio below 80%.

One reason for this pattern is that where borrowers have difficulty paying their mortgage, a lower LTV ratio at origination means they are less

(1) See McCann (2014).
(2) See Financial Services Authority (2009).
(3) Such a relationship is also found in studies of US data: Demyanyk and Van Hemert (2008) find higher LTV ratios at origination were associated with a greater probability of mortgage delinquency and foreclosure. Beyond a correlation between LTV ratios at origination and subsequent default, Wong et al (2011) find that the use of LTV limits makes mortgage defaults less likely following falls in house prices.

Figure 1 The impact of LTV, DTI and ICR limits on resilience and GDP



likely to be in negative equity at the time of distress, and therefore more likely to be able to move to a more affordable property, or exit the investment in the case of a buy-to-let investor. Ultimately, a lender also stands to suffer a smaller loss in the event of possession and forced sale where the deposit put down by borrowers is greater. Lower losses on mortgage lending preserve lenders' capital. Moreover, real estate lenders' access to funding could be affected by confidence in their ability to withstand a decline in the value of real estate exposures. A loss of confidence in the prospects for large, poorly performing mortgage portfolios notably led to a withdrawal of funding for some large UK lenders during the global financial crisis.(1) Strong capital and funding positions enable lenders to maintain their provision of core economic services.

While it may generally be the case that LTV limits are used to address risks to lenders' balance sheets, DTI and ICR limits may also be appropriate. It is intuitive that households who take on higher debt relative to income (whether expressed as DTI, debt servicing ratios (DSRs) or ICR, which expresses debt service commitments relative to rental income) have a higher probability of subsequent mortgage default. Such a relationship has been identified in UK and international data for the owner-occupier mortgage market.(2) Research done in support of the MMR did not find such a link in the United Kingdom through the global financial crisis, though this may have reflected the significant reduction in interest rates and associated improvement in affordability. (3) Less evidence is available for the buy-to-let segment of the mortgage market, but internal Bank of England data show that at end-2014 2.4% of mortgages with an ICR below 125% were in arrears of more than 3 months, compared to 0.8% of mortgages with an ICR above 125%.

3.2 Impact on financial stability via borrower balance sheets

LTV, DTI and ICR limits can directly affect the vulnerability of households to changes in income, house prices and interest rates through their impact on the volume, value and distribution of mortgage lending. This is illustrated in **Figure 1** with arrows linking the impact of the instruments on the housing market to household balance sheets. Since mortgage debt is the single largest liability class on household balance sheets, these limits can enhance the resilience of the economy and so the financial system.

A key channel of risk to financial stability and GDP from the housing market arises from the relationship between the housing cycle and household indebtedness. Empirical evidence suggests that house price upswings that are associated with rising household debt are more likely to end in costlier recessions. Rapid growth in credit is also strongly associated with subsequent economic instability and the risk of financial

(1) See, for example, Financial Services Authority (2011).

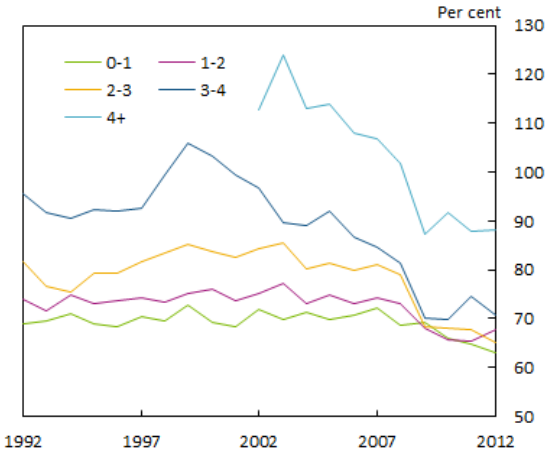
(2) See Bajari, Chu and Park (2008), Amromin and Paulson (2009), Demyanyk and Van Hemert (2008), Chart 5.13 in Bank of England (2014b), and Chart B in Bank of England (2014d).

(3) See Financial Services Authority (2009).

crises.[1]

Imposing limits on lending at high DTI ratios can reduce the indirect threat to financial stability from the build-up in indebtedness of owner-occupier households during the upswing of a housing or credit cycle. Increased household indebtedness may be associated with a higher probability of household distress, and subsequent falls in consumer spending following a shock to interest rates or income, ultimately affecting GDP. **Chart 1** shows that more highly indebted households cut spending by more during the recession than less indebted households. There is also evidence internationally that higher aggregate household DTI ratios were associated with larger falls in consumption (**Chart 2**). Falls in consumption can in turn weigh on wider economic activity, which would negatively affect loan performance and therefore lenders' balance sheets.

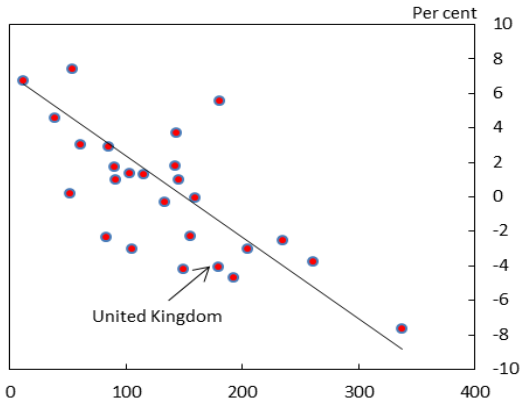
Chart 1 UK mortgagors' non-housing consumption as a share of income by DTI ratio group[(a)(b)]



Sources: Department for Communities and Local Government (DCLG), Living Costs and Food Survey, ONS and Bank calculations.

(a) Chart as published in *Quarterly Bulletin* 2014 Q3. Data have not been updated for latest revisions to national accounts.
(b) Data for 4+ not shown before 2002 as they are erratic and are based on a small sample. Non-housing consumption as a share of income net of mortgage interest payments. Data are scaled so that the total matches the National Accounts. DTI ratios are calculated using secured debt only.

Chart 2 Adjusted consumption growth over 2007–12[(a)]



Household debt to income in 2007, per cent

Sources: Flodén (2014) and OECD National Accounts.

(a) Change in consumption is adjusted for the pre-crisis change in total debt, the level of total debt and the current account balance. See www.martinfloden.net.

DTI limits are less directly applicable for buy-to-let lending given that it is the anticipated rental income from the investment, rather than the income of the borrower, that supports repayments of the loan. Imposing limits on lending at low ICRs makes the balance sheets of buy-to-let borrowers less vulnerable to rises in interest rates and/or declining rental values.

Reducing this vulnerability lowers the probability that buy-to-let investors struggle to meet loan repayments. This in turn reduces the probability of default (impacting on banks' balance sheets); forced reductions in consumer spending by landlords (putting downward pressure on wider economic activity); or forced sales of properties (contributing to the amplification of house price cycles).

Survey evidence suggests that around 15 percent of buy-to-let investors would consider selling their properties if interest payments were no longer covered by rental income. A further 45% would be more inclined to sell if property prices were expected to fall by more than 10%.[2] Such procyclical behaviour could amplify cycles in the housing market with corresponding effects on the volatility of real economic output and employment.

Limiting high LTV borrowing may also enhance

(1) See Crowe et al (2011), Drehmann, Borio and Tsatsaronis (2011),International Monetary Fund (2012a), Schularick and Taylor (2012) and Giese et al (2014).

(2) See 'Bank of England/NMG household' survey 2015, available at www.bankofengland.co.uk/research/Pages/onebank/datasets.aspx#2

financial stability through household balance sheets. One US study found that areas with the greatest fall in household net worth saw consumption fall by 20% compared with 5% for the country as a whole. This fall in spending led to a large rise in unemployment and the authors estimate that 65% of the jobs lost in the United States from 2007 to 2009 resulted from falls in housing net worth.[1] Limits on high LTV lending would reduce the fall in housing net worth for a given fall in house prices, and so could be expected to attenuate some of the negative impact on consumption, employment, and ultimately GDP, associated with falling house prices.

3.3 Amplification

There can be self-reinforcing loops between mortgage lending, expectations of future house price increases and the housing market because housing is the main source of collateral in the real economy. As valuations increase, rising wealth for existing property owners and higher collateral values for lenders can increase both the demand for and supply of credit, feeding back into higher valuations. The channel can be bolstered if rising prices generate expectations of further price increases.

This channel can be more pronounced in the buy-to-let segment of the market, where borrowers are buying properties as investments rather than as their own homes. Investors can draw on equity in existing buy-to-let investments as well as their own homes to fund deposits for new acquisitions, and can use the withdrawn equity to invest in multiple properties, rather than just investing in a more expensive home. Research from the US provides evidence for this dynamic. Haughwout et al (2011) find that, in the 2000's boom, US states that saw bigger booms and busts in house prices tended to have bigger, and faster growing, shares of investors in the housing market.

A key factor exacerbating this channel is that the housing wealth of mortgagors increases more than one-to-one as house prices rise. For example, if an owner-occupier or buy-to-let investor has a mortgage for 90% of the value of a property, a 10% rise in house prices results in a 100% increase in their housing equity, greatly increasing the price they can pay should they choose to move or invest in another property, subject to other affordability constraints. As Stein (1995) has emphasised, this mechanism can explain the observed positive correlation between house price increases and housing transactions. This appears to have been the mechanism at play in the United Kingdom in the 2000s when transactions in the housing market were characterised by a large share of home-movers, LTI ratios were increasing and LTV ratios were falling (as equity gains meant movers could put down larger deposits). In the downturn, this amplification mechanism works in reverse. Falling house prices and weak expectations of future house prices can reduce both the demand and supply of mortgage credit fuelling a self-reinforcing negative feedback loop.

This amplification channel is of central importance because in an upswing higher house prices prompt all borrowers to take on larger loans increasing household indebtedness. This can include both first-time buyers, and existing property owners who withdraw equity for consumption and/or reinvestment. A study for the United States finds that home-owners borrowed 25 cents for every dollar gain in home equity from 2002 to 2006.[2] As discussed in Section 3.2, indebtedness and rapid growth in credit are associated with subsequent economic instability and the risk of financial crises. And in a downturn, the greater the potential fall in house prices, the greater the risk to financial stability for a given level of lender capital or household debt. The interactions between the amplification channel, and lender and household balance sheets, are illustrated in **Figure 1**.

LTV, DTI and ICR limits can be effective in addressing these amplification risks. If use of these instruments led to a reduction in mortgage lending relative to the counterfactual, house price growth might moderate in the near term and expectations for price growth further out might also fall. Lower house price growth could in turn reduce both the supply of and demand for mortgage credit, amplifying the impact of the instruments on the growth of mortgage credit and house prices (**Figure 1**). International empirical evidence shows that housing instruments have often been effective at reducing mortgage credit growth and

(1) See Mian and Sufi (2014). The study also finds that the marginal propensity to consume out of housing wealth was three times higher for households with the highest initial LTV ratios, compounding the effect of high LTV ratios on consumption.

(2) See Mian and Sufi (2011).

house price growth.[1]

3.4 Impact on lending and GDP

In reaching a policy decision, the FPC weighs expected benefits of an action against expected costs. While the evidence on the time period over which macroprudential actions have an effect is mixed, in general the costs of instruments like LTV, DTI or ICR limits taking effect would be more apparent in the short term while the benefits accrue over the medium to long term.[2]

In the past, upswings in the housing market have often been followed by periods of financial instability.[3] Across countries, more than two thirds of the 46 systemic banking crises for which house price data are available were preceded by housing boom-bust cycles.[4] To the extent that the instruments are successful in mitigating the risks discussed above, they may reduce the likelihood and severity of financial crises.[5] Their use would therefore likely have substantial positive benefits for the expected level of UK GDP over time. While the quantitative benefits of the instruments can be estimated in terms of reduced credit losses, fewer highly indebted households, and reduced pro-cyclicality of house prices, it is difficult to quantify the reduction in the probability of crises that would result, or the timing of these benefits. The FPC would have to exercise judgement in assessing the materiality of risks to financial stability that could cause or amplify future economic downturns.

Box 2 illustrates how the FPC can seek to quantify some of the short-term costs in order to help judge the appropriate calibration of LTV, DTI or ICR limits. In the short run, the direct effects of imposing or recalibrating the instruments are likely to be on the distribution of mortgage lending and the expectations of lenders and borrowers. A binding limit would directly affect the amount and distribution of mortgage lending. Lenders might increase the price or tighten lending criteria on mortgages above the specified threshold. Borrowers may respond to this, or the signal of an FPC action, with lower demand for mortgages above the threshold. As a result, use of the instruments could result in either fewer loans being extended or smaller loans being extended than would have been the case without the policy action.

Tighter credit conditions are typically associated with reduced availability of credit for some borrowers, reducing GDP growth in the short run, for example through reduced housing investment and other related spending.[6]

The impact of tighter credit conditions in the mortgage market is dependent on the calibration and circumstances of a limit — Box 2 gives estimates of the impact in some selected circumstances. As any tightening would only be on a specific type of mortgage lending, there could be some substitution towards other types of lending. Further, use of certain instruments could lead to a differentiation in credit conditions across the mortgage market: lenders could in principle loosen credit conditions on mortgages beneath any threshold (see Box 1). When the impact of a limit would be to postpone borrowing (for example whilst saving for a larger deposit) rather than eliminate it, these effects would be temporary and unwind when the transactions took place.

If the outlook for inflation were affected by implementing these instruments, the Monetary Policy Committee (MPC) might consider altering its policy stance. If, for example, reducing the proportion of lending beyond LTV, DTI or ICR limits for financial stability purposes also reduced the aggregate level of mortgage lending and spending in the economy thereby lowering the outlook for inflation, the MPC might consider it appropriate to aim for a more accommodative monetary policy stance than would otherwise be the case. This would limit the impact of the instruments on aggregate demand, in part by supporting the level

(1) See Lim et al (2011), Ahuja and Nabar (2011) and Kuttner and Shim (2012) for cross-country studies. Box 1 discusses specific case studies.
(2) Lim et al (2011) show that the effect on credit growth from housing instruments may be seen relatively quickly, as do Krznar and Medas (2012). But Ahuja and Nabar (2011) find that both LTV and DTI limits require four quarters to have a material impact on house price growth, while Igan and Kang (2011) find that house price appreciation in Korea takes six months to begin to slow down following a tightening in the LTV/DTI ratio, although transactions slow sooner.
(3) See Jordà, Schularick and Taylor (2014).
(4) See Crowe et al (2011).
(5) Dell'Ariccia et al (2012) show that the use of macroprudential instruments decreases the probability that credit booms end up in a banking crisis by about 20%.
(6) For example, Bank of England (2014a) presents estimates suggesting that increasing capital requirements by 1 percentage point would lead to a decline in aggregate bank lending of between 0% and 3.6% and therefore a reduction in GDP of 0.05% to 0.35% in the short run.

of aggregate mortgage lending, without offsetting the beneficial effect of a reduction in higher risk lending within the aggregate.

First-time buyers do not have existing housing equity gains to contribute to a deposit but may expect increases in their income. For these reasons, high LTV and DTI mortgages are more prevalent among first-time buyers. But first-time buyers play an important role in a well-functioning housing market — for older owners (or those inheriting property) to be able to exit from home ownership they must be replaced by new entrants, for example first-time buyers. Permitting a proportion of owner-occupiers to access high LTV or DTI mortgages would allow lenders to extend some of these mortgages facilitating the functioning of the housing market, while limiting the build-up of highly indebted households from rising to unsustainable levels. Similarly, for the buy-to-let market, some loans on low yielding properties may have low ICRs, but the borrower's disposable income may be sufficient to support repayments on the loan. So permitting a portion of low ICR loans may not pose a risk to banks' capital from excess credit risk or to economic activity through household indebtedness.

Box 1

International evidence on the impact of macroprudential measures

Most countries have only recently started using macroprudential housing instruments, but both Hong Kong and Korea have experience from before the global financial crisis in using product instruments such as LTV and DSR limits. Using international examples of Hong Kong and Korea, this box illustrates the effect that product instruments may have on resilience. Using other examples, it also discusses the effects on the distribution of mortgage lending as well as unintended consequences.

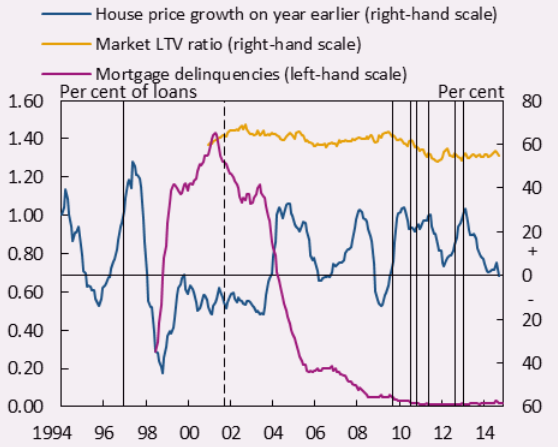
Hong Kong and Korea: impact on resilience

In Hong Kong, the motivation for the use of housing instruments has been to ensure that banks and their customers are sufficiently resilient to house price volatility.[1] The instruments have not been aimed at targeting property prices. There is evidence that the policies have dampened mortgage loan growth but have not had a direct effect on house price growth.[2] LTV limits have been effective at decreasing LTV ratios relative to a counterfactual of no action: the Hong Kong Monetary Authority estimated that the prevailing market LTV ratio would be almost 10 percentage points higher if it had not taken action. And default rates remained low in the face of high house price volatility (**Chart A**). As such, the policy action appeared to have had its desired effect on resilience to house price volatility.

The experience has been similar in Korea. Tightening a DSR or LTV limit had a modest or insignificant effect on short-term house price growth, but reduced transactions significantly with estimates ranging from 5% to 25% in the quarter immediately after a tightening, with smaller effects following a loosening.[3] Household debt was also lower six months after a tightening of the DSR limit: households may have been improving their debt management to get a mortgage approved because all debt payments are included in the definition of the DSR. Moreover,

(1) See He (2013).
(2) See He (2014).
(3) See Igan and Kang (2011).

Chart A Hong Kong house price, market LTV ratios and mortgage loan delinquencies[a][b]



Sources: BIS residential property price database; www.bis.org/statistics/pp.htm, CEIC, Hong Kong Monetary Authority, national sources and Bank calculations.

(a) The fall in delinquencies in the mid-2000s likely reflected an improving macroeconomic situation rather than being attributable to any policy change.
(b) Solid lines represent tightening actions and dashed lines loosening actions. Data until November 2014.

delinquency rates tended to fall after LTV or DSR limits were tightened.[4] Evidence shows that while house price growth in Korea has been low and has occasionally fallen since 2008, the delinquency rate has remained below 1%.[5]

Aggregate results may hide distributional effects and sectoral rebalancing

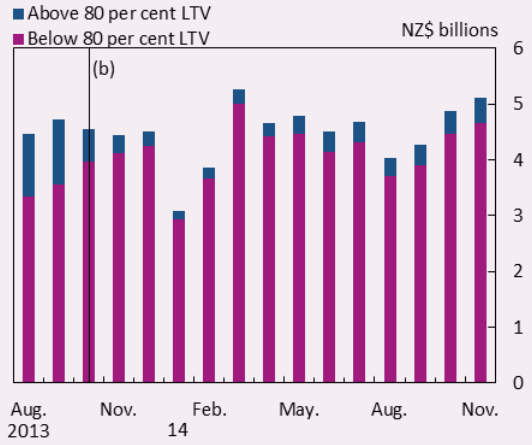
International evidence has tended to focus on the effect of housing instruments on aggregate credit and house prices, mainly due to data availability. However, these can hide the effects of rebalancing in the housing market.

New Zealand implemented a policy in October 2013 to limit mortgages above 80% LTV to 10% of new lending. While the Reserve Bank of New Zealand (RBNZ) has noted that there was a moderation of house price inflation, aggregate credit slowed modestly and DTI ratios were contained, the most notable effect has been within the mortgage market. **Chart B** shows that while new aggregate residential mortgage lending was at a similar level after one year, there had been rebalancing – the share of lending above 80% LTV fell from 25% to 7.7% leading to a potentially less risky portfolio of mortgages. This may have reflected pricing: banks have tended to increase the price of lending above the 80% LTV limit and decreased the price of lending below it. Initial

(4) See Kim (2014).
(5) See Lee (2013).

estimates suggested that the price of lending above 80% LTV was one percentage point higher than lending below 80% LTV. The proportion of first time buyers fell immediately after the LTV restrictions were introduced but the RBNZ noted that this partly reflected an unwinding of a surge in first time buyer sales in 2013, and the proportion in 2014 was only slightly lower than the average since 2005.[1]

Chart B New residential mortgage lending in New Zealand[a]



Source: Reserve Bank of New Zealand.

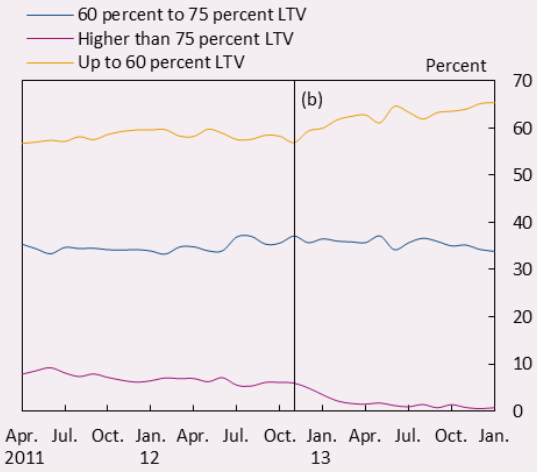
(a) Data until November 2014.
(b) October 2013 policy which limited loans above 80% LTV to 10% of new loans.

Israel provides a further example. The authorities have implemented several different policy measures, such as limiting the variable interest rate component of mortgage loans, DSR limits, LTV limits, and SCRs since 2010 to limit risks from the housing market.

Throughout these actions both house price and housing credit growth have remained high. But the macroprudential measures have marked a significant shift in the distribution of lending. Since the LTV limit of 70% was introduced in November 2012, the proportion of these mortgages has fallen from 6% to 0%. But this has not led to an increase in the proportion of mortgages at LTV ratios just below 70%. In fact, this proportion remained largely constant and it was the proportion of loans at lower LTV ratios that increased notably, along with a decline in the average LTV (**Chart C**). Although this information should be treated cautiously, it does suggest that the measures were successful in reducing some elements of risk in the housing market.

(1) See Reserve Bank of New Zealand (2014).

Chart C LTV ratio distribution of new residential mortgage loans[a]



Sources: Bank of Israel and Bank calculations.
www.boi.org.il/en/DataAndStatistics.

(a) Data until February 2014.
(b) LTV ratios for housing were capped at 70%, excluding first-time buyers.

Buy-to-let lending

Several countries have also applied macroprudential policies to non-owner-occupied residential properties. A common choice of policy for this sector is LTV limits, and where they have been applied, they have typically been tighter than for owner-occupied properties. For example, Singapore and Hong Kong have introduced tighter LTV limits for properties that are not for owner-occupation or properties beyond a first home (see **Table 1**). In Ireland and New Zealand, policies have been applied to the buy-to-let sector, and they have also been tighter than for the owner-occupier lending.

In 2015 the Central Bank of Ireland announced that only 10% of the total value of buy-to-let mortgage lending should exceed an LTV ratio of 70%.[2] This was tighter than the 15% share of mortgage lending permitted for first-time buyer loans with an LTV ratio above 90%[3], and for home-mover loans with an LTV ratio above 80%. Similarly, in 2015 the Reserve Bank of New Zealand (RBNZ) announced new regional LTV restrictions due to the accumulation of housing market risk in Auckland.[4] This stated that a maximum of 5% of new buy-to-let mortgages in

(2) See Central bank of Ireland (2015).
(3) For the first 220 thousand euros of a first-time buyer home, with an 80% LTV limit applied to the remaining value of the property.
(4) See Reserve Bank of New Zealand loan-to-value ratio restrictions FAQs, available at: www.rbnz.govt.nz/faqs/loan-to-value-ratio-restrictions-faqs

this region should exceed an LTV ratio of 70%, compared to a maximum of 10% of loans to owner-occupiers above an LTV ratio of 80%. Since the policy was announced, new investor lending at LTVs above 70% across the whole country has fallen by around one-third.[1]

Table 1 Actions on loans for owner-occupied and non-owner-occupied properties

Country	Date	Instrument	Owner-Occupied	Non-Owner-Occupied/Second Properties
Singapore	2013	LTV	Cap of 60-80%	Cap of 20-50%
Hong Kong[a]	2015	LTV	Cap of 50-60%	Cap of 50%
Ireland	2015	LTV	No more than 15% of loans above 90% LTV (first-time buyers), 80% (home-movers)	No more than 10% of loans above LTV of 70%
New Zealand (Aukland)	2015	LTV	No more than 10% of loans above LTV of 80%	No more than 5% of loans above LTV of 70%
Hong Kong	2015	Stressed DSR	Cap of 60%	Cap of 50%

Sources: Central Bank of Ireland, Hong Kong Monetary Authority, Monetary Authority of Singapore, Reserve Bank of New Zealand.

(a) For applicants whose income is mainly derived from Hong Kong.

Amongst the major advanced economies, the policy action taken to date most directly comparable to ICR instruments is the use of DSR limits for non-owner-occupied properties in Hong Kong. In February 2015, the HKMA set a maximum 50% DSR, to be calculated at a stressed interest rate, on non-owner-occupied properties. The borrowers' 'income' for the purposes of the DSR calculation included both rental income and other sources of income, and 'debt' included mortgage payments from the property as well as other debt obligations. This DSR limit was tighter than the 60% rate applied to owner-occupied mortgages. A benefit of using ICR instruments over such DSR limits is that they isolate the costs and income associated with the buy-to-let property. They thus ensure that the property itself generates positive net income, reducing the incentive to sell buy-to-let properties in response to rising interest rates, falling rents, and/or falling house prices, reducing the risks from amplification.

(1) See Reserve Bank of New Zealand (2016)

However, not all effects are positive, especially if the measures are circumvented

In Korea, there were some unintended side effects of macro-prudential measures aimed at the housing market. The DSR regulation appears to have led to extended mortgage maturities, which in turn increased the maturity mismatch between banks' funding and lending and hence liquidity risk.[2] Moreover, as regulations were originally applied to the banking sector, this led to increases in lending through non-bank financial institutions — and a subsequent extension of the regulatory perimeter. There were some attempts by banks to circumvent the regulations through increasing their commercial mortgage or other household loans which were not subject to the same regulation. But other rebalancing not aimed at avoiding the regulations also took place. For example, banks with greater reliance on mortgage loans, and that were more affected by the tightened regulations, shifted their portfolio to increase lending to small and medium-sized enterprises.[3]

Measures have often been aimed at targeting overall debt. When they have only been applied at the loan level, a potential and widely occurring source of leakage has been into second charge mortgages or unsecured lending. For example, following the introduction in 2010 of an LTV limit in Sweden, banks stated that it was more common to grant an unsecured loan in 2012 than it was prior to the introduction of the limit, and 10% of mortgages in 2012 had unsecured loans attached which allowed total borrowing for housing purchase to exceed the 85% LTV limit.[4] Unchecked this can be significant. In the United States, the average fraction of transactions with a second mortgage rose from just under 10% in 1998 to almost 50% in 2006.[5] Slovakia had a similar experience of leakage into further mortgage products following a 2001 decision to introduce an LTV limit of 70% which did not cover 'other housing loans'. This lending then surpassed traditional mortgages, pushing up effective LTV ratios. 'Other housing loans' made up almost a quarter of non-performing loans in 2012.[6]

The timing of implementation has also sometimes

(2) See Kim (2014)
(3) See Hoshi and Kim (2012).
(4) See Finansinspektionen (2013).
(5) See Adelino, Schoar and Severino (2012).
(6) See International Monetary Fund (2012b).

had destabilising effects. For example, the Canadian authorities initially had a three-month lag between policy announcement and implementation but this led to a bringing forward of housing transactions to avoid the restrictions and the policy implementation lag has subsequently been reduced to two weeks. On the other hand, the RBNZ had a six week gap between announcement and implementation but did not see pre-emptive activity. They attributed this to the setting of clear supervisory expectations of compliance with the spirit of the measure.

Recent years have seen an increase in the use of macroprudential policy to reduce risks associated with the provision of mortgages. The international experience discussed in this box suggests that housing instruments have been used effectively in several countries to increase the resilience of their financial systems. Part of this effect comes through a rebalancing in the mortgage market and this effect is hidden or understated if only aggregates such as total credit or house prices are examined. However, implementation and design of policies should be carefully considered to avoid potential leakages, negative unintended consequences and to ensure the effectiveness of policy actions.

Box 2

Quantifying the short-run impact of DTI, LTV and ICR limits

This box presents analysis of the impact of DTI, LTV and ICR limits on lending and growth in the short run. The impact of these limits is dependent on their calibration and on the economic environment in which they are used. The analysis here shows examples only. The short-run impacts described must be set against the substantial benefits of reduced household indebtedness and lower housing market volatility for economic stability and reduced likelihood and severity of financial crises.

Other than the FPC's June 2014 Recommendation on LTI ratios, such regulatory instruments have had limited use in recent history in the United Kingdom. The approach to analysing the costs and benefits will be updated and expanded as more is learned about their use. Instruments have frequently been imposed in other countries and Box 1 describes what we can learn about their impact from some selected examples. This box considers the impact of the applications of four different types of housing instruments. For a DTI instrument on the owner-occupier market the analysis published in June 2014 as part of the FPC's Recommendation to limit the proportion of new owner-occupier mortgages at high LTI ratios is shown.(1) The FPC's LTI Recommendation is a type of DTI limit, though on this occasion the FPC did not apply the restrictions to all debt owed by an individual, but rather just the first-charge mortgage being extended. To demonstrate the potential impact of other forms of housing instruments estimates of the following hypothetical policy actions are provided:

- an LTV instrument for the owner-occupier market implemented in periods of high mortgage credit growth (1986 and 2006).
- an LTV instrument for the buy-to-let market implemented in 2004.
- an ICR instrument for the buy-to-let market implemented in 2011.

The box starts by showing the potential impact on mortgage lending of each form of instrument individually. It then discusses how the scope of a policy can affect lending in other subsets of the mortgage market, the potential impact of the modelled reduction in lending on short-run GDP, and how the impact of the instrument on amplification, and expectations about the housing market could have caused additional impacts.

The choice of scenarios is purely illustrative and intended to explain the potential short-run impact of an activation of the housing policy instruments on lending and growth. The scenarios should not be interpreted as implying anything regarding the FPC's view on the actual policy stance or precise calibration of the housing policy instruments had they been available at the time. Any estimate of the impact of a hypothetical policy action is dependent on the outlook for the housing market at the time. The quantitative estimates in this box are therefore illustrative of how the impact can be modelled, not of the impact of activating the instruments in general.

Short-run effect on lending

In order to produce reasonable estimates of the impact of an LTV, DTI or ICR limit on lending it is necessary to consider how lenders and borrowers would react. There are a range of possible responses to such limits. At one end of the spectrum, lenders could simply lend to fewer borrowers above the threshold. At the other end, borrowers could choose to take a smaller loan or purchase a cheaper property in order to reduce their borrowing to below the threshold. That is, LTV, DTI or ICR limits could lead to fewer or smaller loans being extended than would be the case in the absence of the limits. The approach developed to model the impact of the FPC's June 2014 LTI Recommendation took an intermediate approach — with some of the adjustment coming through the total number of mortgages extended and some through the size of these mortgages.(2)

(1) In June 2014, the FPC recommended that only 15% of the flow of new mortgages could be at LTI ratios at or greater than 4.5. See Bank of England (2014b).

(2) For details of the modelling approach, see the Annex to Chapter 3 of Prudential Regulation Authority (2014).

DTI instrument for owner-occupier lending

When making policy decisions, the FPC needs to develop a view on the outlook for the housing market in the absence of any policy action. In June 2014, the FPC considered two alternative scenarios to provide a quantitative assessment of the impact of its action: a central scenario and an upside scenario. The scenarios were used to illustrate how the housing and mortgage markets might evolve, including the resulting effect on the distribution and overall level of household indebtedness.

The central scenario was consistent with the MPC's central projection for developments in the housing and mortgage market in the May 2014 *Inflation Report*. The upside scenario illustrated how risks might evolve if momentum in the housing market continued to build — similar to patterns seen in the UK housing market in the early 2000s. These aggregate scenarios were used to model how the underlying distribution of lending might evolve in the following three-year period.

The analysis showed that if house prices and mortgage approvals grew in line with the central view, the impact of the Recommendation was likely to be minimal, including on the projected distribution of LTI ratios. In contrast, in the upside scenario the LTI limit was expected to affect the distribution of LTI ratios in new lending. **Table 1** illustrates that the impact of the Recommendation depends on the future path of the housing market: in the central scenario the action has no immediate impact because the share of new mortgages extended at high LTI ratios does not exceed the allowed proportion. In the upside scenario, where the limit binds, fewer mortgages would be advanced and net lending would be lower than in the absence of the policy action.

The LTI Recommendation is a type of DTI limit, though on this occasion the FPC did not apply the restrictions to all debt owed by an individual but rather just the first-charge mortgage being extended. As described in Section 2, there are two policy motivations why the FPC might wish in principle to use a wider definition: if non-mortgage lending is growing as a result of a policy action, and if non-mortgage lending is contributing significantly to household indebtedness. The use of an LTI limit in June 2014 was appropriate given prevailing circumstances and the current scope of regulation: the LTI limit could be monitored using data available at the time, whereas broader DTI limit would have imposed greater implementation costs on lenders which did not appear warranted given that the vast majority of household debt at that time was in first-charge mortgages and there was little evidence of individuals taking on other debts due to the housing market. The FPC might use a wider definition if there was evidence of substantial growth in unsecured debt related to activity in the housing market. The calibration of policy action would reflect the definition of debt that the FPC chose to use so a policy using a broader definition of debt could have either a smaller or larger impact on lending than one using a narrower definition.

Table 1 Estimated impact on mortgage lending of the FPC's June 2014 LTI Recommendations, 2014 Q2– 2017 Q1

	Cumulative outlook (no policy)		Impact of policy	
Scenario[a]	Central	Upside	Central	Upside
Mortgage approvals (millions)[b]	3	3.5	0	-0.2
Net secured lending[c]	15%	25%	0	-2.5 pp

Source: Bank of England (2014b)

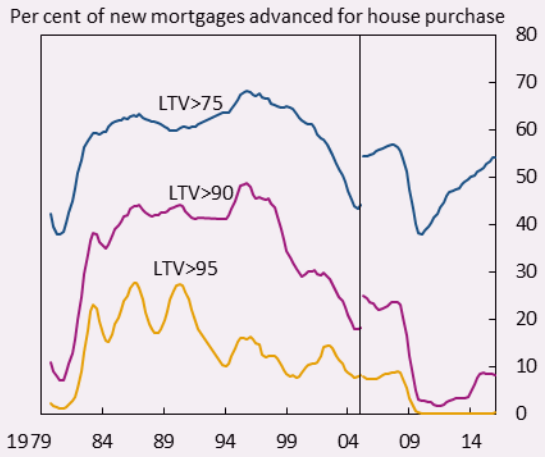
(a) Both the central view and upside housing scenarios are consistent with market practices around assessing affordability in 2014, and the FPC's recommendation on the appropriate interest rate stress to use in assessing affordability.
(b) All approvals for house purchase, including buy-to-let.
(c) As a share of the stock of secured lending to households in 2014 Q1.

LTV instrument for owner-occupier lending

The potential impact of a limit on LTV ratios can be illustrated by considering the impact if a limit had been imposed during or prior to previous periods of strong mortgage credit growth. The impact of an LTV limit is illustrated for two periods: 1986–88 when a large share of lending was at high LTV ratios (**Chart A**); and 2006–07 when some lenders were moving into higher LTV lending.

These historical examples cannot capture the full nuance of any actions, most critically how lenders, borrowers and the authorities might have reacted to a policy action. Further, a number of factors have changed over time: market conditions; the nature of mortgage lending; the characteristics of the financial sector; and the nature and quality of data. All of these considerations point to treating outputs of economic models with caution. But the examples illustrate the channels that the FPC

Chart A Flow of new mortgage lending for house purchase by LTV ratio[(a)(b)(c)(d)(e)]



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

(a) Data until March 2016.
(b) Data are shown as a four-quarter moving average.
(c) Data include loans to first-time buyers, council/registered social tenants exercising their right to buy and home-movers.
(d) The PSD includes regulated mortgage contracts only.
(e) Data from the FCA's PSD are only available since 2005 Q2. Data from 1993 to 2005 are from the Survey of Mortgage Lenders, which was operated by the CML, and earlier data are from the 5% Sample Survey of Building Society Mortgages. The data sources are not directly comparable: the PSD covers all regulated mortgage lending whereas the earlier data are a sample of the mortgage market.

Table 2 Estimated impact on mortgage lending of LTV limits on owner-occupier mortgage lending[(a)]

	Average mortgages per month('000)[(b)]		Impact of policy (%)	
	Total	Impact	Mortgages[(b)]	Gross lending[(c)]
1986-88				
No policy	100	-	-	-
Share permitted with LTV>90%				
45%	100	0	0	0
40%	96	-4	-4	-4
35%	89	-11	-11	-10
2006-07				
No policy	89	-	-	-
Share permitted with LTV>90%				
20%	89	0	0	0
15%	87	-2	-2	-1
10%	81	-7	-8	-6

Sources: Bank of England, Building Society Association/Department for Environment, Trade and the Regions, Council of Mortgage Lenders, FCA Product Sales Data (PSD), ONS and Bank calculations.

(a) The data sets used and scope of mortgages included differ for the two periods. 1986–88 is modelled using the 5% Sample Survey of Building Society Mortgages and considers only mortgages for house purchase. 2006–07 is modelled using the PSD and considers mortgages for house purchase and remortgages with an increase in principal.
(b) Owner-occupier mortgages for house purchase only.
(c) All mortgage lending in scope, including remortgaging in 2006–07.

would seek to quantify when making a decision on any use of the housing instruments. The FPC would reflect these factors in its assessment of the impact of the instruments.

Table 2 shows the impact of various limits as if they were applied to the two example periods, all using a threshold of 90% LTV but with a range of proportions of new lending permitted above that threshold. The impact is estimated with the same modelling approach used for the June 2014 LTI Recommendation. That is, some adjustment due to the policy comes via borrowers purchasing cheaper properties and taking smaller loans, and some via lending to fewer borrowers. For each period, the table shows three calibrations of the LTV limit: one for which the share permitted above the threshold would not have constrained the flow in aggregate given subsequent trends; one which would have constrained the flow at some point in the considered period; and one which would have constrained the flow immediately.

There are uncertainties around these estimates. **Table 2** shows the aggregate impact of the LTV limits. Some lenders would have been lending a higher proportion of mortgages above the threshold so would have been affected by more than the aggregate numbers suggest, while others would have had space within any limit to substitute into higher LTV lending. Those lenders may have chosen not to do so, or they may have opted to maintain a buffer under any limit. In this sense, the numbers in **Table 2** are a lower bound on the impact on mortgage lending.

The numbers in **Table 2** show only the short-run impact, so could also be seen as an upper bound estimate for the ultimate impact on mortgage lending. For instance, many of the buyers who are shown to drop out of the mortgage market in **Table 2** would not have been permanently excluded but rather may have postponed their purchase by saving for longer to purchase a property at a lower LTV.

LTV instrument for buy-to-let lending

The potential impact of an LTV instrument on buy-to-let lending is modelled by assuming a policy was implemented between 2004 and 2009 that prevented each lender from conducting more than 15% of its buy-to-let lending at an LTV greater than

75%.[1] During this period both gross buy-to-let mortgage lending and the share at high LTV ratios rose, and then retracted. As such, the policy would have prevented a large part of the flow of new high LTV lending that occurred just before the global financial crisis, but would have had little impact on the volume of new lending in the immediate post-crisis period. Detailed data on underwriting standards in the buy-to-let market prior to 2007 are not available, but market intelligence suggests that in 2004 around 50% of new buy-to-let mortgages had LTV ratios greater than 75%. Data for 2007 indicate that standards had deteriorated, such that 65% of new loans had LTV ratios above this level. **Table 3** shows that the mechanical impact of the policy would therefore have been to reduce buy-to-let lending for house purchase by 35% in 2004, and 50% in 2007. Total mortgage advances for house purchase would have been 4% and 8% lower respectively given the share of mortgage lending to the buy-to-let market at the time. As discussed in the section for owner-occupier instruments, the impact on lending could have been greater if lenders with a lower share of high LTV lending were reluctant to increase their high LTV lending to offset the reduction by lenders with a higher share. Alternatively, it could have been lower if potential borrowers responded by taking out smaller loans, or increasing the size of their deposits. By 2009, with lending standards having adjusted following the crisis, the same policy would not have been binding on banks. This illustrates how a carefully calibrated policy can bind only in circumstances where risks are building that later cause financial instability and disruption to the real economy.

ICR instrument for buy-to-let lending

The potential impact of an ICR instrument is modelled using a hypothetical situation in which policymakers implemented a policy in 2011 that prevented banks from conducting lending at an ICR lower than 125% based on a 7% mortgage interest rate. This was a period during which buy-to-let lending began to recover from its post-crisis trough, though lending at high LTV ratios remained considerably lower than pre-crisis, so the LTV policy used in the previous example would have had little impact.

Table 3 Estimated impact on mortgage lending of an LTV limit on buy-to-let lending

Table shows the impact of a policy introduced in 2004 Q1 that prevented each lender from conducting more than 15% of its buy-to-let lending at an LTV of greater than 75%.

	2004	2007	2009
Reduction in volume of gross buy-to-let mortgage lending for house purchase			
Percent of mortgage advances	35%	50%	0%
Thousands of mortgage advances	51	92	0
Reduction in the volume of total gross mortgage lending for house purchase[a]			
Percent of mortgage advances	4%	8%	0%

Sources: Council of Mortgage Lenders and Bank calculations.

(a) This assumes that the buy-to-let policy has not affected the level of owner-occupier mortgage lending.

Data on ICRs at that time are limited, but suggest that mechanically this policy would have prevented around two-thirds of buy-to-let mortgage lending. Given this data on the distribution of ICR ratios is only available for a snap shot, it has been assumed that the distribution, and therefore the impact on buy-to-let lending remained the same over the period.[2]

The policy would have reduced total mortgage lending for house purchase by 7% in 2011, and 8% in 2013 given the increase in the share of total mortgage lending accounted for by the buy-to-let market. The impact could have been smaller than suggested by these mechanical calculations if borrowers had increased their deposit (to reduce their loan size and hence ICR), though it could have been larger if the policy had an impact on market sentiment, for example, by reducing expectations of capital gains from future house price growth.

Scope of policy

The overall impact on mortgage lending and the housing market depends on the scope of the LTV, DTI or ICR limit, and the type of mortgage lending to which it is applied. The analysis above assumes

(1) Further details on the two hypothetical scenarios discussed for the buy-to-let market are available in HM Treasury (2015). That publication also includes estimates of the effectiveness of the policies in reducing credit losses following economic shocks that occurred three years after implementation. For the LTV policy example this shock was the global financial crisis. For the ICR example the shock is a hypothetical scenario broadly similar to that considered by the Bank of England in its 2014 stress test scenario (see Bank of England (2014e)).

(2) As discussed in Section 4, the Bank of England has published some details of its planned loan-level data collection for the buy-to-let sector. This will provide detailed data on the distribution of ICRs in new lending. See Bank of England (2016b & 2016c).

Table 4 Estimated impact on mortgage lending of an ICR limit on buy-to-let lending

Table shows the impact of a policy introduced in 2011 Q1 that prevented each lender from conducting lending at an ICR lower than 125% based on a 7% mortgage interest rate.

	2011	2013
Reduction in volume of gross buy-to-let mortgage lending for house purchase		
Percent of mortgage advances	65%	65%
Thousands of mortgage advances	40	54
Reduction in the volume of total gross mortgage lending for house purchase[(a)]		
Percent of mortgage advances	7%	8%

Sources: Council of Mortgage Lenders and Bank calculations.

(a) This assumes that the buy-to-let policy has not affected the level of owner-occupier mortgage lending.

no substitution between the owner-occupier and buy-to-let mortgage market, and buy-to-let lending by lenders authorised by the PRA or FCA and those which are not. In practice, a policy applied to one sector of the market could impact on lending in other sectors of the market.

As an example, a policy applied just to the owner-occupier market could lead to substitution to the buy-to-let market. This could be the case if the calibration of the policy meant some potential first-time buyers were forced to delay purchases until they had saved a larger deposit or their income had increased. Any resulting increase in demand for accommodation in the private rental sector, combined with lower house price growth from reduced owner-occupier demand, could boost rental yields and the demand for buy-to-let investments.

Similarly, the impact of a policy which only constrained the volume of buy-to-let lending could be offset by an increase in lending to owner-occupiers. If the policy restrained buy-to-let lending and dampened house price growth, which as discussed in Section 3.3 could be more exacerbated for the buy-to-let market, it could make houses more affordable boosting demand from owner-occupiers.

A policy which constrained buy-to-let lending could also be offset by an increase in buy-to-let lending by lenders not authorised by the FCA or PRA. These lenders conduct unregulated lending only and tend to rely on wholesale finance, debt markets or peer-to-peer markets. These currently account for less than 1% of total lending so would need to see very strong growth in market share if they were to have an impact on total lending or reduce the effectiveness of the instrument.

As with all macro-prudential policies, the Bank would monitor any leakage, and could take action, if it believed this leakage was reducing the effectiveness of the instrument. In the case of leakage between the owner-occupier and buy-to-let sectors of the mortgage market, the FPC would consider whether this leakage posed a risk to financial stability. It would not consider action merely on the basis of the balance of the two types of lending in the market, which is beyond the FPC's remit. In the case of leakage to lenders not authorised by the PRA or FCA, the FPC could recommend that HM Treasury amend the regulatory perimeter, in order to bring such lenders within scope of the instruments, if warranted.

Short-run effect on GDP

For some calibrations of the instruments, the modelling above indicates a decrease in gross mortgage lending due to the macroprudential policy action. As discussed in Section 3.4, such a decrease would be expected to have a negative impact on GDP in the short run. **Table 5** shows estimates of the impact on GDP at the end of the period for the policy actions illustrated above. The range given for owner-occupier instruments reflects different modelling approaches of how LTV or DTI limits feed into credit conditions across the whole mortgage market and how monetary policy might react. The ranges do not capture the uncertainty around each of those modelling approaches.[(1)] Estimates of the impact of buy-to-let instruments on short-run GDP are estimated using a model described in Cloyne et al (2015).

Amplification and expectations

The analysis does not fully take into account the amplification mechanism illustrated in **Figure 1** between lending, house prices and expectations on credit growth and short-run GDP. In particular, they do not fully account for:

(1) The modelling approach supposes that an FPC policy leads to higher spreads on mortgage lending — either a subset, or all lending. That may, or may not, be followed by a monetary policy response. The estimate published in Bank of England (2014b) for the LTI Recommendation showed a plausible upper bound derived from a model mapping the effect of changes in interest rates in different sectors to GDP — an impact on all mortgage lending, with no monetary policy offset. Table 5 above shows, for owner-occupier instrument, the full range of impacts from the different modelling approaches.

Table 5 Estimated impact of LTV, LTI and ICR limits on short-run GDP

	Percent reduction in GDP at end of period with policy in place[(a)]
Policies aimed at the owner-occupier mortgage market	
2014 Q2-2017 Q1	
15% permitted with LTI>4.5	
Base case scenario	0
Upside scenario	0.06-0.25
1986-88	
Share permitted with LTV>90%	
45%	0
40%	0.02-0.12
35%	0.06-0.33
2006-2007	
Share permitted with LTV>90%	
20%	0
15%	0.01-0.06
10%	0.06-0.28
Policies aimed at the buy-to-let mortgage market	
2004-2007	
15% permitted with LTV>75%	0.21
2011-2013	
0% permitted with ICR<125% at 7% interest rate stress	0.14

Source: Bank calculations.

(a) For owner-occupier instruments this includes the impact on housing investment due to fewer transactions.

- **The impact of the collateral channel.** If house prices rose less quickly as a result of a policy action, existing property owners' equity would also have grown less quickly. As a result, they might purchase a cheaper property if moving, or be able to borrow less against their property in order to purchase additional properties or increase consumption. But lower house price growth might mean that those purchasing properties took on lower debt than they would have in the absence of an LTV, DTI or ICR limit (or took on the same debt but purchased a higher-value property). And there might be some borrowers who did not enter the market in the absence of a policy action but who would if house prices rose by less.

- **The impact of changes to confidence and expectations.** Both lenders and borrowers might act differently in response to an LTV, DTI or ICR limit than anticipated here. For example, lenders might choose to operate with a buffer, so extend fewer mortgages restricted by the policy than permitted; borrowers might view a policy change as a signal to limit their own mortgage borrowing more generally; and investors driven by expectations of capital gains might have less incentive to enter the market.

As outlined in the main text, housing instruments offer medium and longer-term benefits by reducing the risks to financial stability that arise from the housing market. In determining an appropriate policy, the FPC can use analysis such as that illustrated in this box to weigh the short-run costs against those benefits. As with the costs, the magnitude of the benefits will depend on the environment and outlook for the housing market at the time of implementation. The FPC will use its collective judgement to determine the relative weight to give to all factors, including the advancement of the objectives of the PRA and FCA, when deciding policy actions.

4 Indicators for adjusting the housing policy instruments

No single set of indicators can ever provide a perfect guide to systemic risks emanating from the housing market, or to the appropriate policy responses, given the tendency for markets to evolve over time and time lags before risks become apparent. Judgement will, therefore, play a material role in all FPC decisions and policy will not be mechanically tied to any specific set of indicators.

The FPC has, however, identified a list of core financial and economic indicators for LTV, DTI and ICR limits. As with the equivalent indicators for the CCyB and SCRs, these will be routinely reviewed in conjunction with analysis of the drivers of movements. These indicators form part of the regular briefings to the FPC, provide consistency to FPC decision-making and give a basis for explaining the Committee's decisions to an external audience, which should help to enhance the predictability of the regime and reinforce the signalling channel of macroprudential policy.

In any particular set of circumstances, some of these indicators will be more important than others in helping the FPC reach its judgements. But the greater the degree of deviation from historical benchmarks suggested by the core indicators, the more uniform the picture that the different indicators convey, and the more supported that picture is by market and supervisory intelligence, the more likely it is that the FPC will adjust the housing instruments in response. The indicators will be considered alongside those for the CCyB and SCRs, market and supervisory intelligence, and 'stress tests' to judge whether capital instruments or housing instruments are a more appropriate response to risks stemming from a particular sector of the economy or in aggregate. The indicators will be published alongside the wider information set informing the FPC's decisions in its *Financial Stability Report* every six months and, for the CCyB indicators, on the Bank's website every quarter. [(1)(2)]

The interpretation of these indicators may change as the FPC deploys them to help guide its decisions. If banks, businesses and households come to expect that policy actions will be partially informed by particular indicators, they may respond in a way which results in the historical relationships between those indicators and systemic risk weakening. The indicators will also evolve over time as the FPC learns from experience, as the financial system and housing market evolve, as data availability and quality improve and as new research is undertaken. For example, the FPC will consider the range of indicators for the buy-to-let market when the planned loan-level data collection for this sector of the market becomes available. The Bank has published some details of the collection, which will bring the availability of data on the buy-to-let market closer to that available for the owner-occupier market.[(3)]

4.1 High-level considerations

Core indicators should highlight the need to tighten or loosen limits on LTV ratios, DTI ratios, or ICRs in a timely manner when threats to systemic stability from the housing market are rising or receding. As discussed in Section 3, risks to financial stability can arise from the housing and mortgage markets through their impact on lender balance sheets, which would point to including indicators on changes to lenders' mortgage portfolios, or through their impact on household balance sheets, which would point to including indicators on household indebtedness. These risks may be amplified by a cycle of rising house prices and overextension of credit, which suggests including indicators on conditions and terms in the housing and mortgage markets.

LTV, DTI and ICR limits may need to be adjusted through the cycle. The historical international experience is that house prices and housing-related credit tend to move together and display strong cyclical behaviour. As house prices, and so loan values, rise, the probability of a subsequent fall in prices increases.[(4)] Moreover, the larger the increase in prices, the larger the potential fall.[(5)]

(1) See FPC Core Indicators, available at: www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx.
(2) The publication schedule was amended following the FPC's meeting on 19 June 2018 – for more details, see the Record of that meeting; www.bankofengland.co.uk/record/2018/financial-policy-committee-june-2018.

(3) See Bank of England (2016b & 2016c).
(4) Barrell et al (2009), Borio and Drehmann (2009) and Mendoza and Terrones (2008) suggest that house prices are an indicator of future financial crises.
(5) Claessens, Kose and Terrones (2011) suggest different types of financial crises can magnify each other, such that when a credit boom is accompanied by a housing boom the resulting crisis is more severe.

This increases the risk that borrowers are highly indebted when entering a downturn and may fall into negative equity. To avoid this cyclical effect, the instruments may need to be tightened as housing market activity rises. At other times, it may be appropriate to loosen or remove limits when threats to resilience from the housing market which they originally targeted have receded.

The different types of instruments may interact with the cycle in different ways. To moderate risks stemming from lender balance sheets, limits on LTV ratios may be tightened as an upswing in housing market activity develops, such that mortgage borrowing towards the peak of a cycle requires a higher deposit to account for the greater risk of loss to the lender. In contrast, a given DTI and ICR limit may inevitably become more binding during an upswing as house price growth (and hence the level of borrowing and associated interest) outstrips income and rental growth, which may lessen the need for further tightening of the instruments. However, a tighter DTI or ICR limit may also be warranted if there is an increase in risks to household income (which can also affect the level of rent landlords are able to charge).

These high-level considerations suggest that an appropriate set of indicators for the housing instruments should include: measures on lender balance sheet stretch to inform in particular LTV limits; measures on household balance sheet stretch to inform in particular DTI and ICR limits; and measures relating to conditions and terms in the housing and mortgage markets, including prices, to assess amplification channels. **Table A** on page 45 lists the FPC's core indicators for its housing instruments, provides definitions for each indicator, and sets out latest and previous values and historical benchmarks for each indicator. The indicators are discussed in detail below and Section 4.4 considers the performance of these indicators prior to the global financial crisis. Since instability often follows periods of rapid change in the financial system, it will be important to consider both significant changes in indicators and their absolute level. The FPC will also consider disaggregated series of core indicators across a range of dimensions.

The indicators may also be useful in judging whether or not policy has been effective. Success in this context means reducing the risk of a major disturbance to the financial system, which has its roots in the housing market, without having a significant adverse effect on aggregate economic activity, in line with the FPC's objectives. The probability of a future systemic financial crisis cannot be readily observed. The success of the FPC's actions may, however, be partially assessed with reference to whether the indicators used to prompt and justify intervention evolve in ways that are more appropriate and sustainable. At the same time, it will also be important to consider whether other indicators have moved in an adverse way, given the risk of unintended consequences, for example, whether unsecured lending rises following a limit on high LTV mortgages.

4.2 Lender balance sheet and household balance sheet stretch (indicators 1–3)[(1)]

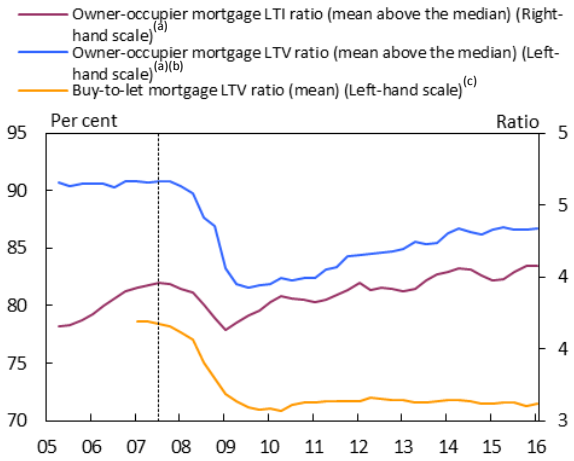
The level of **LTV and LTI ratios on new mortgages (indicator 1)** are natural indicators for gauging the riskiness of mortgage lending and hence for setting LTV or DTI limits.[(2)] The FPC will assess the overall distribution of new mortgage lending when conducting its analysis; however, to summarise the information within this distribution in a concise indicator, particular focus would be placed upon the mean above the median LTV ratio and the mean above the median LTI ratio (**Chart 3**).[(3)] Since it is the upper end of the distribution of LTV or LTI ratios that tend to create financial stability risks, the indicators selected are based on the average of the top half of the distribution. In addition to providing the FPC with a means to measure the risks to the financial system arising from new mortgage lending, these indicators would also be a guide as to whether setting LTV and DTI limits had been effective. **Chart 4** shows the median of LTV and LTI ratios for the owner-occupier mortgage market for which a longer time series is available.

(1) Many of the charts in this and the next subsection contain vertical dashed lines marking the start of periods of major financial stress in the United Kingdom: the secondary banks crisis from 1973 Q4 (Reid (1982)); the small banks crisis from 1990 Q3 (Logan (2000)); and the global financial crisis from 2007 Q3.

(2) When the core indicators were first set data on DTI ratios of new mortgages were not available, so the LTI ratio, for which data was available, was selected. The FPC will consider in due course whether broader ranges of the DTI ratio can be added to the core indicator set.

(3) The mean above the median is defined as the average LTV (or LTI) ratio of new mortgages that are in the upper half of newly issued mortgages ordered by their LTV (or LTI) ratio. These are the mean above the median on owner-occupier mortgages only.

Chart 3 LTV and LTI ratios on UK mortgage lending: mean above the median

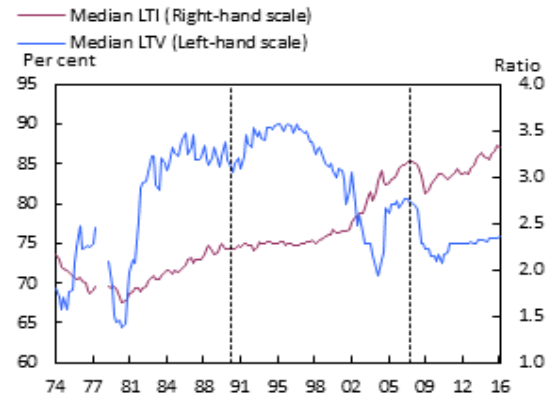


Sources: Bank of England, FCA Product Sales Data and Bank calculations.

(a) FCA Product Sales Data includes regulated mortgage contracts only.
(b) 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 home movers, and excluding lifetime mortgages and advances with LTV ratio above 130% (LTI above 10x).
(c) Estimated mean LTV ratio of new non-regulated lending advances, of which buy-to-let is 88% by value. The figures include further advances and remortgages. The raw data is categorical: the share of mortgages with LTV ratio less than 75%; between 75% and 90%; between 90% and 95%; and greater than 95%. An approximate mean is calculated by giving these categories weights of 70%, 82.5%, 92.5% and 97.25% respectively.

Data currently produced for buy-to-let lending do not allow a consistent time-series for the distribution of LTV or ICR ratios for buy-to-let lending to be calculated in this way. For this sector of the market, the current set of indicators show the mean LTV ratio for buy-to-let lending only. The Bank's planned loan-level data collection will provide data that allows indicators showing the tail of high LTV and low ICR lending for the buy-to-let sector of the market to be added to the indicator set.

Chart 4 LTV and LTI ratios on UK mortgage lending: overall medians(a)

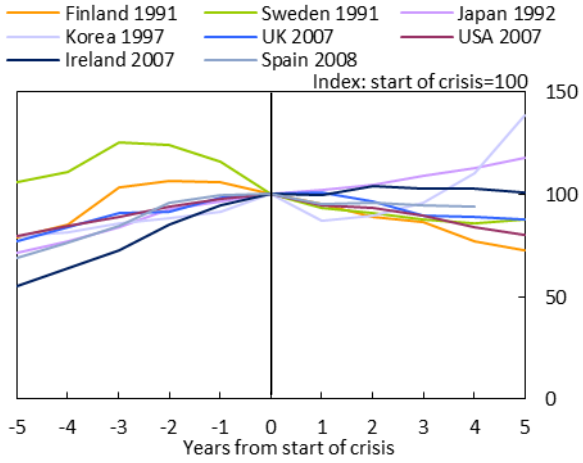


Sources: Council of Mortgage Lenders.

(a) Median LTV (respectively LTI) ratio for mortgage advances to owner-occupiers for house purchase (excludes remortgages).

As set out in Section 3, the role of the housing stock as a source of collateral means that rising house prices can fuel credit growth, which in turn can inflate housing valuations to generate a self-reinforcing loop that amplifies risks to financial stability. Credit growth responds more quickly than the stock when the financial cycle turns, so may be a potentially timely indicator of the need to alter the stance of housing market instruments. Moreover, household credit growth tends to be a leading indicator of crises.(1) During times of rapid credit expansion, a tightening of housing instruments might be warranted to ensure that mortgage lending does not become unduly risky, pointing to the usefulness of monitoring **nominal household credit growth (2).**

Chart 5 Household DTI ratios before and after major crises(a)



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

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

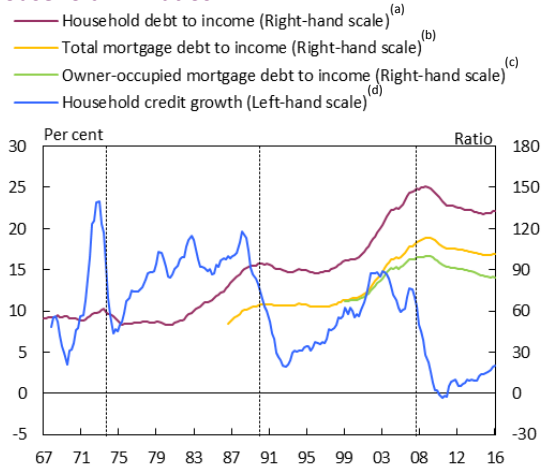
The pace of credit expansion, while informative, is not revealing about the level of indebtedness of households. Persistent credit flows over a period of time or credit expansion to substitute for weak household income growth may stretch household balance sheets even if the pace of credit growth is moderate. High indebtedness relative to the ability

(1) See Büyükkarabacak and Valev (2010) and Ferrari and Pirovano (2014) for specific evidence on credit to the household sector. A much wider literature exists regarding the role of credit in general in predicting crises.

of households to generate income may pose systemic risks to the financial system. This highlights the importance of also considering **household debt to income ratios (3).** These have increased sharply in advance of a wide range of crises internationally, playing, for example, a key role in the recent financial crises in the United States and Ireland (**Chart 5**). In the United Kingdom, household debt to income also increased sharply both prior to the global financial crisis as well as the recession in the early 1990s **(Chart 6).**

Judgement is required when interpreting the ratio of household debt to income. It may be difficult to disentangle slow-moving trends in indebtedness from cyclical swings. Although slow-moving changes could be a concern because fragility can increase even if indebtedness grows gradually, they might reflect non-threatening developments in the financial system, for example a deepening of financial intermediation.

Chart 6 UK household credit growth and household DTI ratios



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

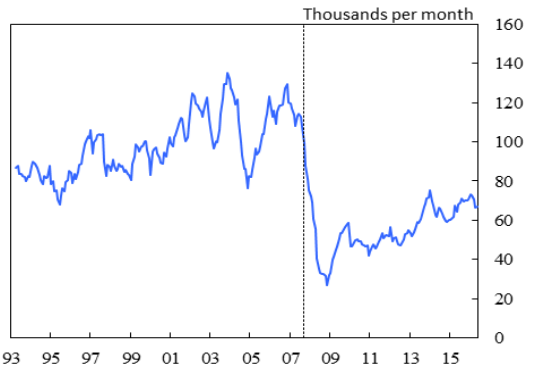
(a) Gross debt as a percentage of a four-quarter moving sum of disposable income. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM).
(b) Total debt secured on dwellings as a percentage of a four-quarter moving sum of disposable income. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM).
(c) Due to data limitations, the mortgage debt of owner occupiers is calculated as the product of the share of total mortgage debt directed to owner occupiers on the asset side of lenders' balance sheets with total loans secured on dwellings on the liabilities side of household balance sheets.
(d) The twelve month nominal growth rate of credit. Defined as the four quarter cumulative net flow of credit divided by the stock of credit 12 months ago. Credit is defined as all financial liabilities of the household and not-for-profit sector except for the unfunded pension liabilities and financial derivatives of the not-for-profit sector.

The FPC will also monitor **the ratio of household mortgage debt to household income**, including the relative shares of owner-occupier and buy-to-let borrowers (**Chart 6**). These indicators cover the different portions of lending over which the FPC's housing instruments operate. Furthermore, the difference between mortgage debt and total debt to income largely captures the ratio of unsecured lending to household income. So together the indicators can potentially detect leakage to other sources of credit beyond mortgages in response to policy actions.

4.3 Conditions and terms in markets (indicators 4–9)

The indicators covering the total household debt stock may miss developments specific to the mortgage market. As a result, the FPC will also consider the **number of new mortgage approvals (4)** for house purchase. Mortgages are approved early in the process of buying a home and thus lead other indicators of market activity. A collapse in the number of new mortgage approvals, as happened in the early stages of the 2007/08 global financial crisis in the United Kingdom (**Chart 7**), suggested a tightening in credit conditions at a point at which overall household credit was still growing faster than GDP. The level of approvals gives an indication of the rate of turnover of lenders' mortgage stock, so, in conjunction with other indicators, provides information about the change in composition of their portfolio. For example, high approvals and high LTV ratios simultaneously would suggest that the stock of mortgages is becoming increasingly risky. This may require the FPC to act more aggressively than if high LTV mortgages were common but lending flows were modest.

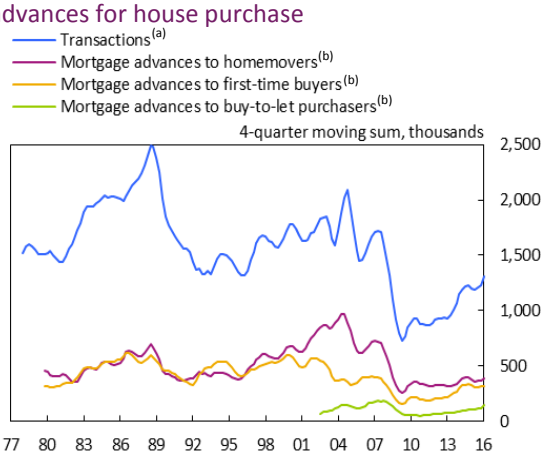
Chart 7 Mortgage approvals for loans for house purchase(a)



Sources: Bank of England.

(a) Data are for monthly number of approvals of loans for house purchase secured on dwellings covering sterling loans by UK MFIs and other lenders to UK individuals. Approvals are measured net of cancellations. Seasonally adjusted.

Chart 8 Housing transactions and mortgage advances for house purchase



Sources: Council of Mortgage Lenders, HMRC and Bank calculations

(a) The number of houses sold/bought in the current and preceding three quarters 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.
(b) The number of new mortgages advanced for house purchase in the current and preceding three quarters.

The FPC will also track the overall level of activity in the housing market by **considering total housing transactions (5)**. Moreover, it is important to monitor activity in individual segments of the housing market. Therefore, the FPC will look at the breakdown of housing transactions, specifically the number of mortgages advanced (for the purposes of home purchase) to first-time buyers, home-movers and buy-to-let investors (**Chart 8**). Transactions net of these three series give an indication of the level of cash buyers in the market.

The **interest-only share of new mortgage advances for house purchase** will also be monitored across different segments of the housing market (**Chart 9**). Interest-only mortgages are indicative of several risks, which differ between the owner-occupier and buy-to-let mortgage markets. For owner-occupiers a plan to repay an interest-only loan may involve investing in risky assets, the price of which may evolve differently to, and be more volatile than, the value of housing.[1] The risk is reduced for buy-to-let mortgages, the majority of which tend to be extended on an interest-only basis. Buy-to-let investors have more flexibility to sell the property to make the capital repayment, though a significant fall in house prices could threaten their ability to do this. However, highly levered interest-only borrowers remain highly levered as they do not pay down debt until maturity. These factors mean that interest-only mortgages could pose additional threats to the resilience of lenders' balance sheets. Moreover, if repayment plans involve selling assets, either financial or the houses themselves, large cohorts of interest-only borrowers attempting to sell simultaneously may depress prices and so pose additional risks to financial stability.

Mortgage credit growth is one side of the self-reinforcing loop that can be seen in housing markets; the other is **the rate of growth in house prices (6)** (**Chart 10**). Rapid house price growth increases the value of collateral, which may ease credit constraints and encourage further borrowing. Empirically, in the United Kingdom, house price growth has tended to turn before credit growth which gives prices an additional role as a leading indicator. International evidence also suggests that house prices tend to signal vulnerabilities well in advance and turn before measures of credit quantities.[2] And since mortgages issued at peak prices would be particularly at risk of negative equity, the FPC may be concerned about the LTV ratios of newly issued mortgages after a period of rapid house price growth. To that end, the FPC will also monitor other metrics of house price valuations to assess whether it was particularly expensive to purchase housing assets.

One such measure is **house prices to household disposable income (7)**. The higher house prices are relative to income, the more difficult it would be for new borrowers to meet their mortgage repayments out of their earnings. However, other factors can influence sustainable house price to income ratios such as demographic and supply dynamics, changes in real interest rates, shifts in term or inflation premia and changes in credit availability. **Chart 11** shows the evolution of the ratio of house prices to household disposable income around major crises. The indicator typically rises in the years ahead of crises signalling impending distress, often peaking 1–2 years in advance of crises.

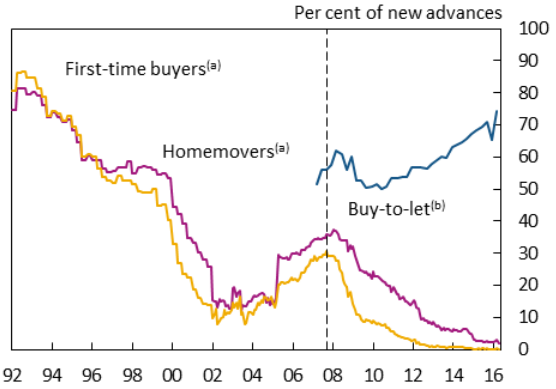
(1) Under the FCA's rules lenders are permitted to offer interest-only mortgages only when borrowers have a credible plan to repay the mortgage capital.

(2) See European Systemic Risk Board (2014).

An alternative measure of the long-run sustainability of house prices is the **rental yield (8)** on rented properties, ie the ratio of rental income to the value of the property (**Chart 12**). This series can be linked to the price of housing in a number of ways. First, the rental yield can be compared directly to returns on other asset classes; for example, it is analogous to the dividend yield on equities, and if the returns on rental housing are out of line with other assets, it might suggest a risk that prices of houses could adjust. Such comparisons provide a means to judge how attractive housing is in contrast to other investment assets. Second, this series is indicative of the relative cost of the substitute to owning a house, ie renting. This is an input into whether a household chooses to rent or to buy a home, which in turn feeds into demand for houses from first-time buyers. Third, home buyers may invest in properties in anticipation of capital gains, driving up valuations and depressing rental yields. Low yields on housing may be acceptable if prices are expected to increase but there is a potential for a correction if such expectations prove overly exuberant. These channels are related and may interact both with each other and with other features of the housing market. For example, the cost of mortgages is another input into the relative price of buying a home. As a result, when considering this indicator, the FPC will exercise judgement and evaluate the message presented by the rental yield in the context of other information about conditions in the housing market.

Spreads on new mortgage lending (9) (ie the cost of mortgage borrowing relative to risk-free rates) provide a timely gauge of conditions in domestic loan markets and complement indicators of the quantities of lending described above. The FPC will consider the spreads on aggregate total mortgage lending to households and, separately, buy-to-let mortgages. Wide lending spreads during periods of stress may indicate tight credit supply (as in the United Kingdom in the years following the 2007/08 global financial crisis) (**Chart 13**). And in expansions, considering spreads alongside changes in the quantity of credit may help to identify whether credit growth is largely driven by an increase in supply by financial institutions or by strong demand from households — which could lead to different policy actions. The overall spread on mortgage lending may miss changes in the relative prices of mortgages across risk categories.

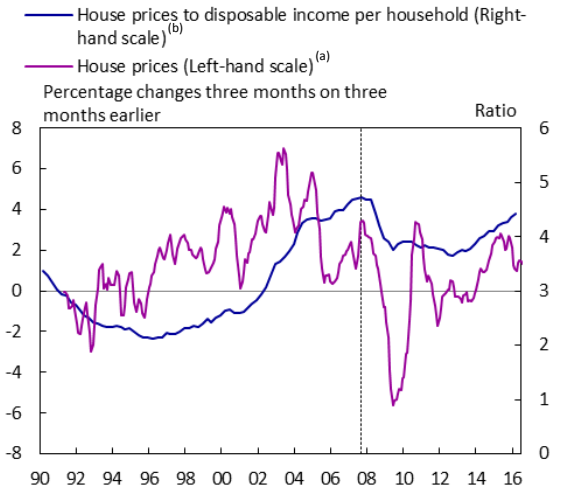
Chart 9 Share of new UK mortgages that are interest only



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

(a) The share of new owner-occupier 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 CML switches source. Data prior to 2002 are at a quarterly frequency.
(b) The share of unregulated mortgages that are interest only (in volume terms). The data include all mortgages not just those for house purchase. Interest-only mortgages exclude mixed capital and interest mortgages.

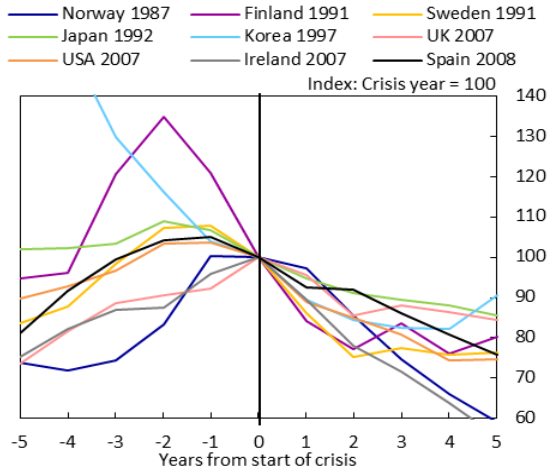
Chart 10 UK house price to income ratio and house price growth



Sources: Department of Communities and Local Governments, Halifax/Markit, Nationwide, ONS and Bank Calculations.

(a) House prices are calculated as the mean of the average UK house price as reported in the Halifax and Nationwide house price indices.
(b) The ratio is calculated using gross disposable income of the UK household and non-profit sector per household as the denominator. Aggregate household disposable income is adjusted for financial intermediation services indirectly measured (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.

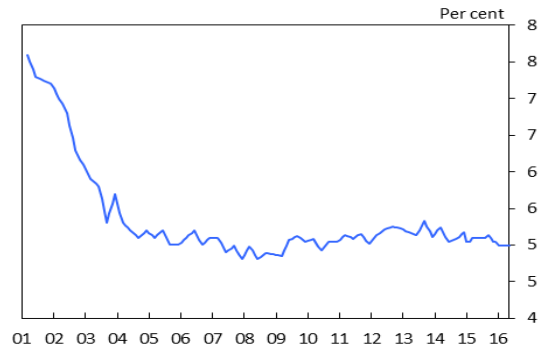
Chart 11 House price to income ratios before and after major financial crises[(a)]



Sources: OECD and Bank calculations.

(a) House prices to income as compiled by the OECD. The years beside the country names give the dates of the first year of a banking crisis, based on Reinhart and Rogoff (2009).

Chart 12 UK gross annual rental yield[(a)]



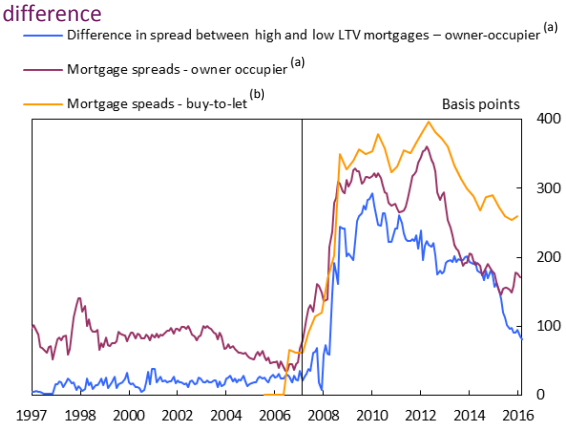
Sources: Association of Residential Letting Agents (ARLA), LSL Property Services plc. and Bank calculations.

(a) The rental yield is the ratio between the annual rental income generated from a rented property and the value of the property. These data are as reported from a survey of members of the Association of Residential Letting Agents until 2014. From 2015 onwards, the series uses LSL Property Services plc. data (for England and Wales) normalised to the ARLA data over 2008 to 2014, when both series are available.

The difference in the spread between new high and low LTV mortgages[(1)] is a means to capture how risk is priced.[(2)] A period of declining spread differentials suggests that the mortgage markets are demanding a reduced risk premium for high LTV mortgages. This could be for two reasons. First, the additional risk of loss from high LTV mortgages could be viewed as having fallen. This would perhaps be true when house prices are perceived as being undervalued and a period of house price inflation is expected. Second, mortgage lenders could require less compensation for the risk stemming from a high LTV loan which may occur during exuberant periods when competitive pressures are high. Both effects may present risks to financial stability and thus may prompt the FPC to act.

The difference in spreads was stable and near zero in the United Kingdom prior to the 2007/08 global financial crisis (**Chart 13**), suggesting that markets saw little additional risk from high LTV mortgages. However, the spread widened once the crisis took hold. It should also be noted that lending spreads are affected by the degree of competition, which varies across different products in the United Kingdom, and a range of other factors that may not be linked to the financial cycle.

Chart 13 Spread on new UK mortgage lending and difference



Source: Bank of England, Bloomberg, FCA Product Sales Database, Moneyfacts and Bank calculations.

(a) The overall spread on residential mortgage lending is a weighted average of quoted mortgage rates over safe rates, using 90% LTV two year fixed rate mortgages and 75% LTV tracker, two and five-year fixed rate mortgages. Spreads are taken relative to gilt yields of matching maturity until August 2009, after which spreads are taken relative to OIS of the same maturity. Spreads are taken relative to Bank Rate for the tracker product. Weights are based on relative volumes of new lending. The difference in spread between high and low LTV lending is the rate on 90% LTV 2-year fixed rate mortgages less the 75% LTV 2-year fixed rate.

(b) The spread on new buy-to-let mortgages is the weighted average effective spread charged on new floating and fixed rate unregulated mortgages over safe rates. Spreads are taken relative to Bank Rate for the floating rate products. The safe rate for fixed rate mortgages is calculated by weighting 2-year, 3-year and 5-year risk free interest rates by the number of buy-to-let fixed rate mortgage products offered at these maturities. The risk free rates are gilts of the appropriate maturity until August 2008, after which the OIS is used.

(1) This is the difference in the interest rates charged on 75% and 90% LTV mortgages. This indicator is for the owner- occupier market only as for buy-to-let market 90% LTV mortgage products are generally not available.

(2) An indicator based on the relative spread on mortgages across LTI ratios could be added to the set of core indicators in the future should the practice become standard.

4.4 What did the core indicators suggest prior to the global financial crisis?

What does the core indicator set suggest about the need to have used the housing instruments prior to the global financial crisis? As pointed out above, several of the core indicators signalled strong housing and mortgage market activity just prior to the crisis (**Table A**), specifically: (i) rapid credit growth and the record levels of household indebtedness; (ii) the record high ratio of house prices to household disposable income in mid-2007; and (iii) low mortgage spreads on an overall basis. Taken as a whole the indicators at the time did seem to signal risks from the housing market to financial stability. However, in retrospect, the extent of the housing market's eventual impact on the financial system during the recent crisis is less clear-cut. One channel from mortgage lending to financial stability runs through defaults, which could threaten the resilience of lenders via affecting their capital position, their access to finance, and so, their ability to deliver financial services. But it is not clear to what extent such a channel posed major threats to financial stability during the recent crisis. In aggregate, *ex post* bank losses from UK residential real estate exposures were significantly lower than those incurred in other periods (especially in the early 1990s — linked to the different monetary policy response) and in other countries (particularly in the United States). However, *ex ante*, the potential for losses may have eroded the confidence in some major UK lenders, prompting liquidity problems, which may have contributed to the failure of some UK mortgage lenders.

Another channel from mortgage lending to financial stability runs via household indebtedness. The indebtedness of households (of which mortgages account for the largest share) increased rapidly going into the crisis, partly as a consequence of the need to meet rising house prices. Highly indebted households are more vulnerable to adverse shocks and could cut back spending sharply when such events occur. This channel seems to have been apparent during the financial crisis. When the crisis began in 2007, households, particularly those that were most indebted, were vulnerable to, for example, negative shocks to unemployment and wages. This may have led to subsequent falls in consumer spending. However, it is difficult to disentangle this channel from the general fall in demand, wealth and access to finance apparent during the crisis period.[(1)]

These considerations highlight that while the core indicator set is expected to capture developments in risks to financial stability emanating from the housing market, additional information and judgement will also be required, depending on the sources of risk and including both market and supervisory intelligence. This evidence will be included routinely in *Financial Stability Reports*.

(1) Some evidence of the contributions of household indebtedness to consumption over the course of the financial crisis can be found in Bunn and Rostom (2014).

5 Conclusion

Effective macroprudential policy instruments are important to the FPC's ability to meet its objectives. The Government has given the FPC Direction powers over LTV and DTI limits for owner-occupier mortgages, and has prepared draft secondary legislation to give the FPC Direction powers over LTV and ICR limits for buy-to-let mortgages. In July 2015, the FPC published its Policy Statement on LTV and DTI limits for the owner-occupier market which the FPC is required to publish for its Direction powers. That Policy Statement set out how the FPC envisages each policy instrument working, discusses their likely impact on financial stability and economic growth, and explains the circumstances in which the FPC might adjust the setting of each policy instrument. This document is a draft update to that Policy Statement, which has been expanded to include material on the FPC's proposed powers to set LTV and ICR limits for the buy-to-let mortgage market. That material is necessarily in draft form because the legislation conferring these powers on the FPC has not yet been finalised. The FPC is publishing this draft update to its Policy Statement now to inform the Parliamentary debate on the proposed legislation

As experience of operating the regime grows, the Policy Statement will be reviewed and updated by the FPC in line with its statutory obligations.

Table A Core indicator set for LTV and DTI limits[a]

Indicator	Average, 1987–2006[b]	Average 2006[c]	Minimum since 1987[b]	Maximum since 1987[b]	Previous value (oya)	Latest value (as of 1 July 2016)
Lender and household balance sheet stretch						
1 LTI and LTV ratios on new residential mortgages						
Owner-occupier mortgage LTV ratio (mean above the median)[d]	90.6%	90.6%	81.6%	90.8%	86.6%	86.7% (2016 Q1)
Owner-occupier mortgage LTI ratio (mean above the median)[d]	3.8	3.8	3.6	4.1	4.0	4.1 (2016 Q1)
Buy-to-let mortgage LTV ratio (mean)[e]	n.a.	n.a.	70.9%	78.6%	71.5%	71.5% (2016 Q1)
2 Household credit growth[f]	10.3%	11.2%	-0.6%	19.6%	2.4%	3.4% (2016 Q1)
3 Household debt to income ratio[g]	100.1%	141.8%	78.2%	150.5%	131.1%	132.5% (2016 Q1)
of which: mortgages[h]	*70.8%*	*103.8%*	*50.7%*	*113.2%*	*100.9%*	*101.7% (2016 Q1)*
of which: owner-occupier mortgages[i]	*80.6%*	*95.0%*	*67.2%*	*100.0%*	*85.0%*	*84.1% (2016 Q1)*
Conditions and terms in markets						
4 Approvals of loans secured on dwellings[j]	97,916	119,039	26,695	134,873	64,447	67,042 (May 2016)
5 Housing transactions[k]	140,636	139,062	51,940	242,799	101,850	89,700 (May 2016)
Advances to homemovers[l]	48,985	59,342	14,300	93,500	26,200	22,200 (Apr. 2016)
% interest only[m]	53.3%	31.0%	1.8%	81.3%	2.7%	1.8% (Apr. 2016)
Advances to first-time buyers[l]	39,179	33,567	8,500	55,800	23,500	25,100 (Apr. 2016)
% interest only[m]	52.1%	24.0%	0.0%	87.9%	0.4%	0.0% (Apr. 2016)
Advances to buy-to-let purchasers[l]	10,128	14,113	3,600	28,700	8,600	4,200 (Apr. 2016)
% interest only[n]	n.a.	n.a.	50.0%	74.3%	68.4%	74.3% (2016 Q1)
6 House price growth[o]	1.8%	2.2%	-5.6%	7.0%	1.4%	1.3% (May 2016)
7 House price to household disposable income ratio[p]	2.9	4.5	2.1	4.7	4.2	4.4 (2016 Q1)
8 Rental yield[q]	5.8%	5.1%	4.8%	7.6%	5.1%	5.0% (May 2016)
9 Spreads on new residential mortgage lending						
All residential mortgages[r]	81 bps	50 bps	34 bps	361 bps	176 bps	171 bps (Apr. 2016)
Difference between the spread on high and low LTV residential mortgage lending[r]	18 bps	25 bps	1 bps	293 bps	162 bps	81 bps (May 2016)
Buy-to-let mortgages[s]	n.a.	n.a.	61 bps	398 bps	291 bps	260 bps (2016 Q1)

(a) A spreadsheet of the series shown in this table is available at http://www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx.
(b) If the series start after 1987, the average between the start date and 2006 and the maximum/minimum since the start date are used.
(c) 2006 was the last year before the global financial crisis.
(d) Mean LTV (respectively LTI) ratio on new advances above the median LTV (LTI) ratio, based on loans to first-time buyers, council/registered social tenants exercising their right to buy and homemovers, and excluding lifetime mortgages and advances with LTV ratio above 130% (LTI above 10x). FCA Product Sales Data includes regulated mortgage contracts only. Series starts in 2005. Sources: FCA Product Sales Data and Bank Calculations.
(e) Estimated mean LTV ratio of new non-regulated lending advances, of which buy-to-let is 88% by value. The figures include further advances and remortgages. The raw data is categorical: the share of mortgages with LTV ratio less than 75%; between 75% and 90%; between 90% and 95%; and greater than 95%. An approximate mean is calculated by giving these categories weights of 70%, 82.5%, 92.5% and 97.25% respectively. Series starts in 2007. Source: Bank of England and Bank calculations.
(f) The twelve month nominal growth rate of credit. Defined as the four quarter cumulative net flow of credit divided by the stock of credit twelve months ago. Credit is defined as all liabilities of the household and not-for-profit sector except for the unfunded pension liabilities and financial derivatives of the not-for-profit sector. Source: 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). Source: ONS and Bank calculations.
(h) Total debt secured on dwellings as a percentage of a four-quarter moving sum of disposable income. The household disposable income series is adjusted for FISIM. Source: ONS and Bank calculations.
(i) Total debt associated with owner occupier mortgages divided by the four-quarter moving sum of disposable income. The household disposable income series is adjusted for FISIM. Owner occupier mortgage debt estimated by multiplying aggregate household debt secured on dwellings by the share of mortgages on lender balances that are not buy-to-let loans. Series starts in 1999. Sources: Council of Mortgage Lenders, ONS and Bank calculations.
(j) Data are for monthly number of house purchase approvals covering sterling lending by UK MFIs and other lenders to UK individuals. Approvals secured on dwellings are measured net of cancellations. Seasonally adjusted. Series starts in 1993. Source: Bank of England.
(k) The number of houses sold/bought in the current month is sourced from HMRC's Land Transaction Return. From 2008 the Return excluded properties priced at less than £40,000 (2006 and 2007 data have also been revised by HMRC to correct for this). Data prior to 2005 comes from the Survey of Property Transactions; the UK total figure is computed by assuming that transactions in the rest of the United Kingdom grew in line with England, Wales and Northern Ireland. Seasonally adjusted. Sources: Council of Mortgage Lenders, HMRC and Bank calculations.
(l) The number of new mortgages advanced for house purchase in the current month. Buy-to-let series starts in 2001. There are structural breaks in the series in April 2005 where the Council of Mortgage Lenders switches source. Data prior to 2002 are at a quarterly frequency. Sources: Council of Mortgage Lenders and Bank calculations.
(m) The share of new owner-occupied mortgages advanced for house purchase that are interest only. Interest-only mortgages exclude mixed capital and interest mortgages. There are structural breaks in the series in April 2005 where the Council of Mortgage Lenders switches source. Data prior to 2002 are at a quarterly frequency. Sources: Council of Mortgage Lenders and Bank calculations.
(n) The share of unregulated mortgages that are interest only. The data include all mortgages, not just those for house purchase. Interest-only mortgages exclude mixed capital and interest mortgages. Sources: Bank of England and Bank calculations.
(o) House prices are calculated as the mean of the average UK house price as reported in the Halifax and Nationwide house price indices. Growth rate calculated as the percentage change three months on three months earlier. Series starts in 1991. Sources: Halifax/Markit, Nationwide and Bank calculations.
(p) The ratio is calculated using gross disposable income of the UK household and non-profit sector per household as the denominator. Aggregate household disposable income is adjusted for FISIM and changes in pension entitlements. Historical UK household population estimated using annual GB data assuming linear growth in the Northern Ireland household population between available data points. Series starts in 1990. Sources: Department of Communities and Local Government, Halifax/Markit, Nationwide, ONS and Bank calculations.
(q) Using ARLA data up until 2014. From 2015 onwards, the series uses LSL Property Services plc data normalised to the ARLA data over 2008 to 2014, when both series are available. Series starts in 2001. Sources: Association of Residential Letting Agents, LSL Property Services plc. and Bank calculations.
(r) The overall spread on residential mortgage lending is a weighted average of quoted mortgage rates over safe rates, using 90% LTV two year fixed rate mortgages and 75% LTV tracker, two and five-year fixed rate mortgages. Spreads are taken relative to gilt years of matching maturity until August 2009, after which spreads are taken relative to OIS of the same maturity. Spreads are taken relative to Bank Rate for the tracker product. Weights are based on relative volumes of new lending. The difference in spread between high and low LTV lending is the rate on 90% LTV two-year fixed rate mortgages less the 75% LTV two-year fixed rate. Series starts in 1997. Sources: Bank of England, Bloomberg, Council of Mortgage Lenders, FCA Product Sales Data and Bank Calculations.
(s) The spread on new buy-to-let mortgages is the weighted average effective spread charged on new floating and fixed rate unregulated mortgages over safe rates. Spreads are taken relative to Bank Rate for the floating-rate products. The safe rate for fixed rate mortgages is calculated by weighting two-year, three-year and five-year risk-free interest rates by the number of buy-to-let fixed rate mortgage products offered at these maturities. The risk-free rates are gilts of the appropriate maturity until August 2008, after which the OIS is used. Series starts in 2007. Sources: Bank of England, Moneyfacts and Bank calculations.

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