

July 2015

# The Financial Policy Committee's powers over housing tools

A 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. This document meets the legislative requirement to prepare a written statement with regard to the FPC's Direction powers over these housing tools.

### **The Financial Policy Committee:**

Mark Carney, Governor

Jon Cunliffe, Deputy Governor responsible for financial stability

Ben Broadbent, Deputy Governor responsible for monetary policy

Andrew Bailey, Deputy Governor responsible for prudential regulation

Martin Wheatley, Chief Executive of the Financial Conduct Authority

Alex Brazier, Executive Director for Financial Stability, Strategy and Risk

Clara Furse

Donald Kohn

Richard Sharp

Martin Taylor

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

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# The Financial Policy Committee's powers over housing tools

## A Policy Statement

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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;
- (b) Debt to income (DTI) ratios, including interest coverage ratios (ICRs) in respect of buy-to-let lending.

As a result the Government has given the FPC powers of Direction on LTV and DTI limits in respect of owner-occupied lending. It intends to consult on tools related to buy-to-let lending later in 2015, with a view to building an in-depth evidence base on how the operation of the UK buy-to-let housing market may carry risks to financial stability.

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. This document is that Policy Statement for the LTV and DTI limits in respect of owner-occupied lending.

This Policy Statement follows the structure and coverage of the FPC's January 2014 Policy Statement on its powers to supplement capital requirements.<sup>(1)</sup> It describes the housing tools and the proposed scope of their coverage, the FPC's current view of the possible impact of the tools 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 tools.

### 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'.

The FPC has two main powers under the 2012 legislation. 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 (CCB), 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; a separate Policy Statement discusses these leverage powers.

The limits on LTV and DTI ratios 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. These limits would apply to all UK-regulated lenders providing owner-occupied mortgages and would complement the FPC's existing powers over

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(1) See Bank of England (2014a).



capital requirements. In using these tools, the FPC expects to co-operate 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 tools, 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 and DTI 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 tools rather than issue a Direction.

In line with the Government's legislation, the focus in this Policy Statement is on the tools for the owner-occupied mortgage market. But, where relevant, material has also been included on tools for the buy-to-let mortgage market. 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. This material is intended to be informative for the debate at the point when the Government consults on extending housing tools to cover buy-to-let products. But it will be reviewed and updated depending on the scope of those tools.

### Rationale for and possible impact of the housing tools

In the past, upswings in the housing market have often been followed by periods of financial instability.<sup>(1)</sup> 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.<sup>(2)</sup> There is evidence that housing tools such as LTV and DTI limits may help contain risks from the housing market. The tools work through a number of channels.

The LTV tool operates by placing limits on the proportion of 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 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 tool operates by placing limits on the proportion of mortgages that can be extended at high DTI ratios, which can enhance financial stability by limiting household indebtedness. An increase in 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.

Both tools 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 and DTI limits could in some circumstances affect economic growth by reducing the amount of lending to households. However, internal estimates suggest that these limits would have only a modest negative impact on near-term growth, and international evidence suggests a modest reduction in short-term mortgage and aggregate credit growth. In the medium to long term, where these tools are successful in reducing the likelihood and severity of financial crises, their use is likely to increase the expected level of UK GDP.

The use of these tools might create incentives for activity to migrate into lending not subject to this macroprudential regulation, for example cross-border 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 tools apply.

### Considerations on how to use the housing tools

Many indicators will be useful for shaping the decisions of the FPC on these housing tools and helping it to explain those

(1) See Jordà, Schularick and Taylor (2014).

(2) See Crowe et al (2011).



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 market in the past.

The indicators will be considered alongside those for the CCB and SCRs, market and supervisory intelligence, and 'stress tests' to judge which of the FPC's tools — including existing capital tools or these housing tools — 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 and DTI 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 33. 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 or DTI 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 or DTI limits when threats to financial stability emerge from the UK housing market. The limits would be loosened or removed when such threats have receded. LTV and DTI 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*'.<sup>(1)</sup>

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 2012 legislation. 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 CCB in the United Kingdom.<sup>(2)</sup>

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.<sup>(3)</sup> He asked the FPC to consider the appropriate form of such powers. The interim FPC had noted in March 2012 that LTV and 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:<sup>(4)</sup>

- (a) LTV ratios;
- (b) DTI ratios, including ICRs in respect of buy-to-let lending.

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 intends to consult on tools related to buy-to-let lending later in 2015, with a view to building an in-depth evidence base on how the operation of the UK buy-to-let housing market may carry risks to financial stability.

The powers of Direction over LTV and DTI ratios enable the FPC to require the PRA and FCA to restrict lenders<sup>(5)</sup> 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. 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 tools. 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 tools, 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 and DTI limits because delayed implementation may lead to an adverse outcome in which activity is brought forward.<sup>(6)</sup> 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,

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

(2) See Bank of England (2014a) for more detail on these tools, 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](http://www.gov.uk/government/speeches/mansion-house-2014-speech-by-the-chancellor-of-the-exchequer).

(4) See FPC statement on housing market powers, available at [www.bankofengland.co.uk/financialstability/Documents/fpc/statement021014.pdf](http://www.bankofengland.co.uk/financialstability/Documents/fpc/statement021014.pdf).

(5) In what follows, the term 'lenders' is used to describe the set of firms to which the LTV and DTI limits would apply — namely all regulated mortgage lenders. These institutions are defined explicitly in Section 2.3.

(6) 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.

on occasion, may prefer to recommend a change in such tools rather than issue a Direction.

This document is the Policy Statement on LTV and DTI limits which the FPC is required to publish for its Direction powers. As experience of operating the regime grows, the Policy Statements will be reviewed and updated from time to time.

In line with the Government's legislation, this Policy Statement focuses on tools that would apply to the owner-occupied mortgage market. But where relevant, material has also been included on tools that could apply to the buy-to-let mortgage market. 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. This material will therefore also be informative for the debate at the point when the Government consults on the buy-to-let tools. But it will be reviewed and updated depending on the scope of those tools.

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

The ESRB also recommended that macroprudential authorities should have at least one tool available to address each of these intermediate objectives. Like the CCB and SCR tools, the LTV and DTI tools 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 tools 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 Policy Statement follows the structure and coverage of the Policy Statement on the FPC's powers to supplement capital requirements. Section 2 describes the LTV and DTI tools, including how they would be defined, the lenders and mortgages they would apply to, how decisions would be co-ordinated with overseas regulators, how the tools 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 tools 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 tool and provides a list of core indicators that the FPC will routinely review when reaching decisions. Section 5 concludes.

## 2 Description of the tools

### 2.1 What are LTV and DTI tools?

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

The LTV tool 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. For instance, if a house buyer borrowed a mortgage of 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').<sup>(1)</sup>

The DTI tool 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. For instance, a borrower with a DTI ratio of five has outstanding debt — including the new mortgage loan — of five times annual income. Limits on DTI ratios can enhance financial stability by limiting household indebtedness. The DTI tool 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 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 consumption and therefore put downward pressure on wider economic activity.

For both tools, the FPC could direct the PRA and FCA to apply limits based on two parameters: the LTV or DTI ratio *threshold*, and the *proportion* of the flow of new mortgages that lenders could extend above that threshold. At one extreme, if the proportion were set to zero, the tools would operate as a hard cap where no mortgages with LTV or DTI ratios above the threshold at origination could be extended.

The FPC could specify whether the limit on the proportion of lending above a specified LTV or DTI ratio applies to the value

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. If the concern was about household indebtedness, a volume measure might be more appropriate as it could limit the number of highly indebted households and so potentially moderate the collective reduction in household spending during a downturn. In that case, lenders may, however, have an incentive to undertake high LTV or DTI lending on more expensive properties to, for example, high-income households. If the FPC was concerned that these households 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 or DTI tools.

As discussed in the introduction, the FPC has also recommended that it is given powers of Direction over LTV, DTI and ICR limits with respect to buy-to-let mortgages. The subsections below include some issues relevant to these tools — but this is necessarily incomplete and will need to be extended and updated in the light of the Government's consultation on buy-to-let tools, which it intends to undertake later in 2015.

### 2.2 Definitions for LTV and DTI ratios

The loan figure in the LTV ratio would be the total amount outstanding on all residential mortgage loans to a borrower secured (whether by first or subsequent charge) on their residential property.<sup>(2)</sup> Other borrowings by that owner-occupier would not be included in the loan figure. The property value is taken to be the value 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.

In order to provide sufficient scope to mitigate risks to financial stability arising from household indebtedness, the DTI limit 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

(1) See Section 3.1.

(2) Section 2.4 sets out the mortgages in scope of the tools.

limit risks to financial stability by affecting indebtedness (see Box 1).

The definition of 'debt' for the DTI 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'. These loans do not constitute a fixed debt because repayment is determined by the income of the borrower.

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 scope of this definition, it would be able to use its powers of Recommendation 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.

Exact definitions for LTV, DTI and ICR tools for buy-to-let mortgages would have to be specified. The ICR is the ratio between the prospective rental income on a property and the mortgage interest payments over the same time period (generally monthly or annually). The ICR is a widely used market metric which reflects the importance of rental income in determining the ability of buy-to-let landlords to service their debt.

### 2.3 To whom would the tools apply?

The LTV and DTI tools on new owner-occupied mortgages would apply to all PRA and FCA-authorized firms conducting owner-occupied mortgage 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 tools 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 either 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 or DTI limits as it did in its June 2014 Recommendation on high LTI ratios,<sup>(1)</sup> if its analysis showed that the risks to financial stability were different across different sizes of firms or certain firms would be disproportionately affected.

Because no other financial services firms would be covered by these housing tools, there is a risk of creating incentives for activity to migrate to lending not subject to this macroprudential regulation, for example cross-border 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 believes necessary, would make Recommendations to HM Treasury to expand the set of institutions to whom these tools apply.

### 2.4 To which mortgages would the tools apply?

The LTV and DTI tools would apply to new mortgages at the point of origination. The limits would apply to first and subsequent charge mortgages, as well as remortgages with an increase in principal.<sup>(2)</sup> It is irrelevant whether the lender at the point of origination continues to hold the mortgage or has transferred or disposed of the asset.

Business loans secured on residential property are excluded.<sup>(3)</sup> 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.

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

(1) Exemptions from the tools apply if the total size of a lender's mortgage portfolio in value or volume terms falls below the *de minimis* threshold.

(2) The United Kingdom's implementation of the EU's Mortgage Credit Directive is bringing second and subsequent charge mortgages within the definition of a 'regulated mortgage contract' from 21 March 2016.

(3) Loans taken out by a borrower for the purposes of a business carried on by them and secured on their home.



## 2.5 How would decisions on the tools be co-ordinated with overseas regulators?

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

## 2.6 How do these tools 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 tools would interact with microprudential and conduct tools, they serve a distinct purpose. The FCA's mortgage affordability rules, which were strengthened through the Mortgage Market Review (MMR), will not be affected by the tools and continue to be the conduct requirements for lenders when undertaking 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-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 tools are concerned with mortgage losses and overindebtedness 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.

The FPC has aimed for consistency with the FCA's mortgage affordability rules where possible to maintain the link between conduct and macroprudential requirements and minimise the additional burden on lenders.

The housing tools could be set in parallel with capital tools applying to the mortgage market or more widely. Firms are required to have capital against their mortgage exposures for microprudential purposes. Moreover, the FPC's existing

powers over capital requirements, in particular to require a CCB or to direct the PRA to vary SCRs, can increase the resilience of lenders in scope of those tools to housing market risks directly. While capital tools can be used to tackle concerns about banking system resilience, direct limits on lending in the housing market have some additional advantages.

In particular, direct limits on lending may be more effective in preventing house price growth from fuelling overexuberant credit growth, because they directly affect the aggregate amount of mortgages being extended, and so potentially reduce the need to deploy capital tools to support lender resilience. Beyond this, there is a longer adjustment period for implementing changes to capital tools than for these tools, as firms need to be given time to raise the necessary capital. Capital actions can be taken in relation to banks' modelled risk weights, which may be unreliable, whereas lending limits are applied directly.

As discussed in the introduction, 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 very high LTI ratios in June 2014 was achieved through a Recommendation to the PRA and FCA. In addition, the FPC could make other Recommendations if necessary to target different risks from the housing market that may emerge.

## 2.7 How would the FPC's decisions on the housing tools 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 and DTI 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 could be subject to a duty to 'comply or explain'.

The PRA expects to communicate on the framework for implementing FPC Directions on LTV and DTI 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 and DTI 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 tools on financial stability and growth

Imposing limits on LTV or DTI ratios 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 tools. The key transmission channels are illustrated in Figure 1.

A tighter setting of either tool would lead to changes in the mortgage and housing markets which can affect both borrower and lender balance sheets. Lenders with a less risky mortgage portfolio are less vulnerable to credit losses (Section 3.1). And borrowers with lower debts are less exposed to unexpected changes to income 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 might be moderated by use of the housing tools (Section 3.3). By moderating risks from the housing market, these tools 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 tools 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 tools only applies to lenders and lending within the scope of the LTV and DTI limits as discussed in Section 2 and so the impact in practice of the tools would depend on the extent of any leakage. The FPC would monitor whether lending not included in the scope of a Direction,

potentially including buy-to-let lending or lending from non-traditional sources such as peer-to-peer, was leading to a policy action being less effective at mitigating risks to financial stability than intended. Box 1 on the international experience with housing tools gives some examples of leakage seen in other countries.

#### 3.1 Impact on financial stability via lender balance sheets

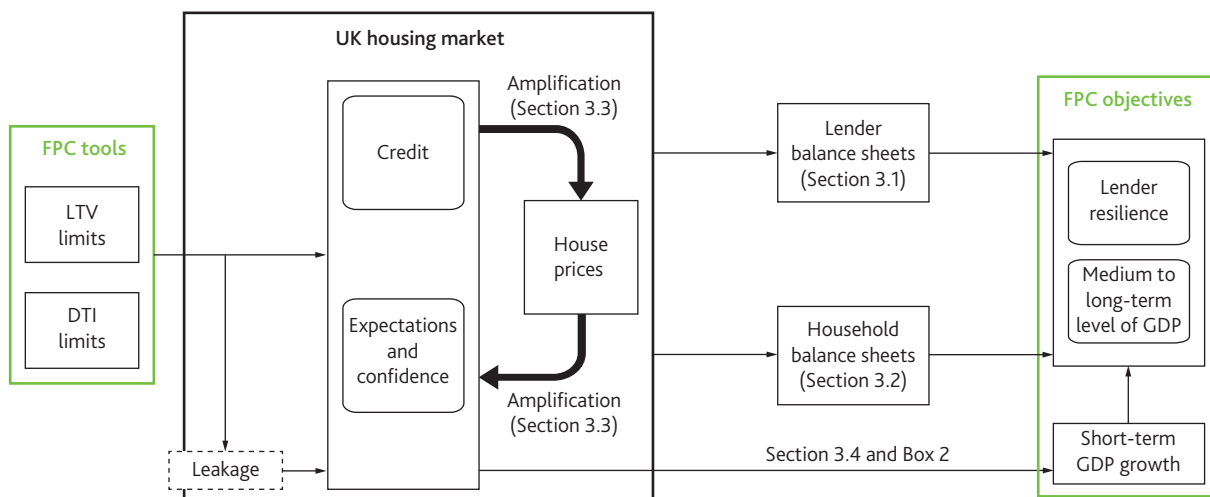
LTV and DTI limits can directly affect the credit risk to which lenders are exposed through their impact on the volume, value or distribution of mortgage lending. This is illustrated in Figure 1 with arrows linking the impact of the tools on the housing market to lender balance sheets. Since mortgage 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, compiled for the MMR, shows that high LTV mortgages have higher default rates.<sup>(1)(2)</sup> 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%. Moreover, where borrowers have difficulty paying their mortgage, a lower LTV ratio means they are less likely to be in negative equity and therefore more likely to be able to move house to a more affordable property. Ultimately, a lender stands to suffer a smaller loss in the event of repossession and forced sale where the deposit put down by borrowers is greater.

(1) See Financial Services Authority (2009).

(2) 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 and DTI limits on resilience and GDP



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 recent crisis.<sup>(1)</sup> 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 limits may also be appropriate. It is intuitive that households who take on higher debt relative to income (whether expressed as DTI or debt-servicing ratios) have a higher probability of subsequent mortgage default. Such a relationship has been identified in UK and international data.<sup>(2)</sup> Research done in support of the MMR did not find such a link in the United Kingdom through the recent crisis, though this may have reflected the significant reduction in interest rates and associated improvement in affordability.

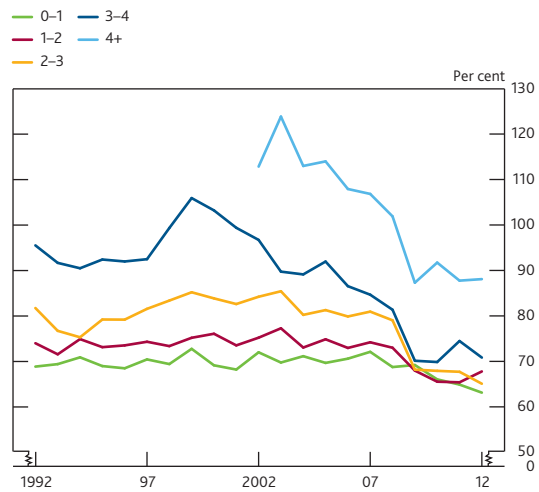
### 3.2 Impact on financial stability via borrower balance sheets

LTV and DTI limits can directly affect the vulnerability of households to changes in income or house prices through their impact on the volume, value or distribution of mortgage lending. This is illustrated in **Figure 1** with arrows linking the impact of the tools 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 crises.<sup>(3)</sup>

Imposing limits on lending at high DTI ratios can reduce the indirect threat to financial stability from the build-up in household indebtedness 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, ultimately affecting GDP. During the recent financial crisis the share of income attributed to consumption fell sharply for households with higher DTI ratios (**Chart 1**). 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

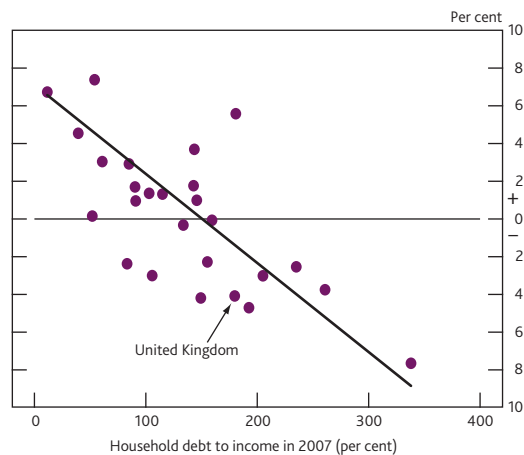
**Chart 1** UK mortgagors' non-housing consumption as a share of income by DTI ratio group<sup>(a)(b)</sup>



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<sup>(a)</sup>



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](http://www.martinfloden.net).

activity which would negatively affect loan performance and therefore lenders' balance sheets.

Limiting high LTV borrowing may also enhance 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

(1) See, for example, Financial Services Authority (2011).  
 (2) See Bajari, Chu and Park (2008), Amromin and Paulson (2009), Demyanyk and Van Hemert (2008), and Chart 5.13 in Bank of England (2014b).  
 (3) See Crowe et al (2011), Drehmann, Borio and Tsatsaronis (2011), International Monetary Fund (2012a), Schularick and Taylor (2012) and Giese et al (2014).

lost in the United States from 2007 to 2009 resulted from falls in housing net worth.<sup>(1)</sup> 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 are 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 homeowners 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. In the downturn, this amplification mechanism works in reverse. This price-credit loop is of central importance because the risk to financial stability for a given level of lender capital or household debt is larger the greater the potential fall in house prices.

If LTV or DTI limits led to a reduction in mortgage lending, 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 tools on the growth of mortgage credit and house prices (Figure 1). International evidence shows that housing tools have often been effective at reducing mortgage credit growth and house price growth.<sup>(2)</sup>

A key driver of the price-credit loop in the housing market is that the housing wealth of mortgagors increases more than one-to-one as house prices rise. For example, if a household has a mortgage for 90% of the value of their 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 move, 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 the housing market was characterised by a large share of movers, increasing LTI ratios and falling LTV ratios (as equity gains meant movers could put down larger deposits). Which tool to use when will depend on the FPC's judgement. For illustration, DTI limits may be useful in some circumstances for leaning against momentum driven either by movers taking on higher debt or in response to low financing costs. LTV limits may be effective at curbing momentum driven by increased demand from first-time buyers, or if it is associated with loosening credit conditions.

House price cycles can also lead to an increase in indebtedness of homeowners even if they do not move, for example through equity withdrawals, contributing to the procyclical relationship between house prices and credit. A study for the United States finds that homeowners borrowed 25 cents for every dollar gain in home equity from 2002 to 2006.<sup>(3)</sup> And in the United Kingdom, some borrowers use gains in housing equity to finance the deposit for purchasing additional properties, as well as for consumption. Including remortgages for which the principal is increased in the scope of LTV and DTI limits helps to mitigate these risks.

### 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 tools like DTI or LTV limits taking effect would be more apparent in the short term while the benefits accrue over the medium to long term.<sup>(4)</sup>

In the past, upswings in the housing market have often been followed by periods of financial instability.<sup>(5)</sup> 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.<sup>(6)</sup> To the extent that the tools are successful in mitigating the risks discussed above, they may reduce the likelihood and severity of financial crises.<sup>(7)</sup> Their use would therefore likely have substantial positive benefits for the expected level of UK GDP over time. While the quantitative benefits of the tools can be estimated in terms of reduced credit losses and fewer highly indebted households, 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 costs in order to help judge the appropriate calibration of LTV or DTI limits. In the short run, the direct effects of imposing or recalibrating the tools are likely to be on the distribution of mortgage lending and the expectations of lenders 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 Lim *et al* (2011), Ahuja and Nabar (2011) and Kuttner and Shim (2012) for cross-country studies. Box 1 discusses specific case studies.

(3) See Mian and Sufi (2011). Homeowners include both those with a mortgage and those without.

(4) Lim *et al* (2011) show that the effect on credit growth from housing tools 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.

(5) See Jordà, Schularick and Taylor (2014).

(6) See Crowe *et al* (2011).

(7) Dell'Ariccia *et al* (2012) show that the use of macroprudential tools decreases the probability that credit booms end up in a banking crisis by about 20%.

borrowers. A binding limit would directly affect the amount and distribution of mortgage lending. Lenders might put higher pricing or tighter lending criteria on mortgages above the specified threshold. Borrowers may respond to higher pricing or the signal of an FPC action with lower demand for mortgages above the threshold. As a result, LTV or DTI limits 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.<sup>(1)</sup>

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. But as any tightening would only be on mortgage lending, there could be some substitution towards other types of lending, for example to buy-to-let mortgages or into unsecured forms of credit if borrowers opt to improve or extend existing homes rather than move. Further, LTV or DTI limits could lead to a differentiation in credit conditions across the mortgage market: lenders could in principle loosen credit conditions on mortgages beneath the threshold (see Box 1). When the impact of a limit would be to postpone borrowing rather than eliminate it, these effects would be temporary and unwound when the transactions took place.

If the outlook for inflation were affected by implementing these tools, the Monetary Policy Committee (MPC) might consider altering its policy stance. If, for example, reducing the proportion of high LTV or DTI lending 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 tools on aggregate demand, in part by supporting the level of aggregate mortgage lending, without offsetting the beneficial effect of a reduction in high LTV or DTI 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 market — for older owners (or those inheriting property) to be able to exit from housing ownership they must be replaced, for example by new entrants. Permitting a proportion of borrowers to access high LTV or DTI mortgages would allow lenders to extend some of these mortgages, while limiting the build-up of highly indebted households from rising to unsustainable levels.

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(1) 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 short-run GDP of 0.05% to 0.35%.

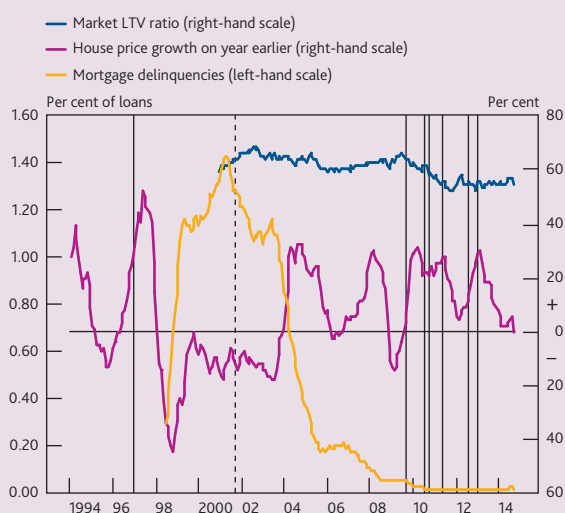
## Box 1 International evidence on the impact of macroprudential measures

Most countries have only recently started using macroprudential housing tools, but both Hong Kong and Korea have experience from before the global financial crisis in using product tools such as LTV and debt-servicing ratio (DSR) limits. Using the examples of Hong Kong and Korea, this box illustrates the effect that product tools 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 tools has been to ensure that banks and their customers are sufficiently resilient to house price volatility.<sup>(1)</sup> The tools 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.<sup>(2)</sup> 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.

**Chart A** Hong Kong house prices, market LTV ratios and mortgage loan delinquencies<sup>(a)(b)</sup>



Sources: BIS residential property price database; [www.bis.org/statistics/pp.htm](http://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.

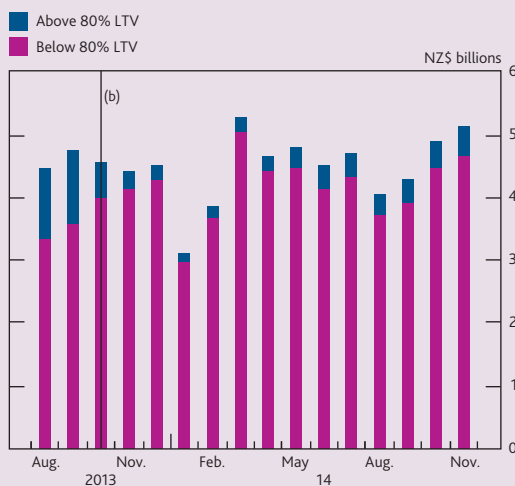
The experience has been similar in Korea. Tightening a DSR or LTV limit had a modest or insignificant effect on short-term house price growth, but reduced transactions significantly with estimates ranging from 5% to 25% in the quarter immediately after a tightening, with smaller effects following a loosening.<sup>(3)</sup> 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, delinquency rates tended to fall after LTV or DSR limits were tightened.<sup>(4)</sup> 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%.<sup>(5)</sup>

### Aggregate results may hide distributional effects and sectoral rebalancing

The international evidence cited in Section 3.3 has tended to focus on the effect of housing tools 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 — lending above 80% LTV fell from 25% to 7.7%

**Chart B** New residential mortgage lending in New Zealand<sup>(a)</sup>



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.

(1) See He (2013).  
(2) See He (2014).  
(3) See Igan and Kang (2011).  
(4) See Kim (2014).  
(5) See Lee (2013).

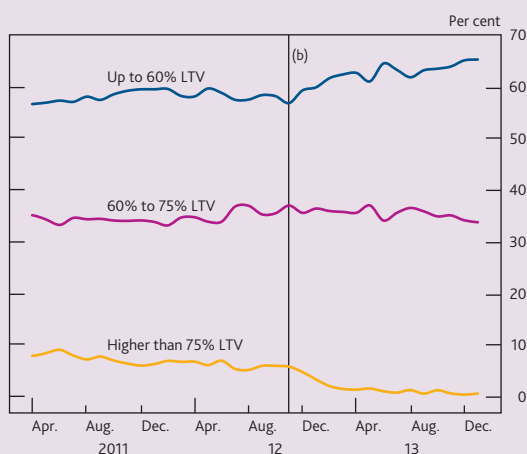


leading to a potentially less risky portfolio of mortgages. This may have reflected pricing: banks have tended to increase the price of lending above the 80% LTV limit and decreased the price of lending below it. Initial estimates suggested that the price of lending above 80% LTV was 1 percentage point 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 current proportion is only slightly lower than the average since 2005.<sup>(1)</sup>

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.

**Chart C** LTV ratio distribution of new residential mortgage loans<sup>(a)</sup>



Sources: Bank of Israel and Bank calculations. [www.boi.org.il/en/DataAndStatistics](http://www.boi.org.il/en/DataAndStatistics).

(a) Data until February 2014.

(b) LTV ratios for housing were capped at 70%, excluding first-time buyers.

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

In Korea, there were some unintended side effects. The DSR regulation appears to have led to extended mortgage loan maturities, which in turn increased the maturity mismatch between banks' funding and lending and hence liquidity risk.<sup>(2)</sup> 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: 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.<sup>(3)</sup>

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 2013 than it was prior to the introduction of the limit, and over 10% of mortgages currently have unsecured loans attached which allows total borrowing for housing purchase to exceed the 85% LTV limit.<sup>(4)</sup> 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.<sup>(5)</sup> 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 third of non-performing loans in 2012.<sup>(6)</sup>

The timing of implementation has also sometimes 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.

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

(2) See Kim (2014).

(3) See Hoshi and Kim (2012).

(4) See Finansinspektionen (2012).

(5) See Adelino, Schoar and Severino (2012).

(6) See International Monetary Fund (2012b).

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 tools 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 LTV and DTI limits

This box presents analysis of the impact of DTI and LTV 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. There are likely to be medium and longer-term benefits from a limit which are not covered in this analysis: a decrease in credit risk for lenders; a reduction in the number of highly indebted households for the economy; and, as a result, a reduced probability or severity of crises. Such limits have had very limited use as regulatory tools in recent history in the United Kingdom and so the approach to analysing these costs and benefits will be updated and expanded as more is learned about their use. Limits have frequently been imposed in other countries and Box 1 describes what we can learn about their impact from some selected examples.

The analysis of a DTI tool presented here was published in June 2014 as part of the FPC Recommendation to limit the proportion of new mortgages at high LTV ratios.<sup>(1)</sup> The LTV analysis is based on historical periods of high mortgage credit growth. 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 tools in general.

#### Short-run effect on lending

In order to produce reasonable estimates of the impact of an LTV or DTI 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 or DTI 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 and some through the size of mortgages.<sup>(2)</sup>

#### DTI

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.

**Table 1** Impact on lending of the FPC's June 2014 LTI Recommendations

	Cumulative outlook		Impact of policy	
	Central	Upside	Central	Upside
Mortgage approvals (millions)	3.0	3.5	0	-0.2
Net secured lending	15%	25%	0	-2.5 pp

Source: Bank of England (2014b).

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 existing data whereas a

(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. This is an example of the DTI tool with debt defined as first-charge mortgage credit only. See Bank of England (2014b).

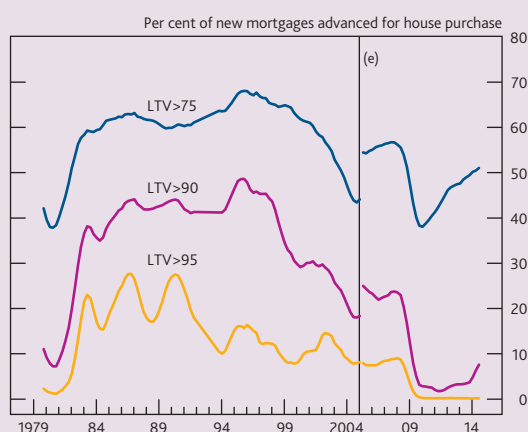
(2) For details of the modelling approach, see the Annex to Chapter 3 of Prudential Regulation Authority (2014).

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.

## LTV

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.

**Chart A** Flow of new mortgage lending by LTV<sup>(a)(b)(c)(d)</sup>



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

- (a) Data until September 2014.
- (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 homemovers.
- (d) The PSD include regulated mortgage contracts only, and therefore exclude other regulated home finance products such as home purchase plans and home reversions, and unregulated products such as second charge lending and buy-to-let mortgages.
- (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.

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 would seek to quantify when making a decision

**Table 2** Estimated impact of LTV limits on lending<sup>(a)</sup>

	Average mortgages per month ('000) <sup>(b)</sup>		Impact of policy (%)	
	Total	Impact	Mortgages <sup>(b)</sup>	Gross lending <sup>(c)</sup>
<b>1986–88</b>				
No policy	100			
<i>Share permitted with LTV &gt; 90%</i>				
45%	100	0	0	0
40%	96	-4	-4	-4
35%	89	-11	-11	-10
<b>2006–07</b>				
No policy	89			
<i>Share permitted with LTV &gt; 90%</i>				
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) Mortgages for house purchase, excluding buy-to-let.

(c) All mortgage lending in scope, including remortgaging in 2006–07.

on any use of the tools. The FPC would reflect these factors in its assessment of the impact of the tools.

**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.

### Scope of policy

The overall impact on the housing market depends on the scope of the LTV or DTI limit, in particular whether all residential mortgage lending is covered. The analysis above covers only owner-occupied mortgages. In the 1980s that was almost the whole market but by 2006–07, buy-to-let accounted for 14% of mortgages advanced for house purchases and 12% of total mortgage lending. There are three broad possibilities for how lending to buy-to-let investors could have been affected by a policy action:

- **A fall in buy-to-let lending:** a parallel policy could have been in place for buy-to-let lending. Such a policy might have been calibrated such that the percentage falls in **Table 2** map across to the whole mortgage market. This might have been appropriate if the limits had been imposed to counter general momentum in the housing market.
- **No impact on buy-to-let lending:** with or without limits applied to buy-to-let lending, there may have been no impact on the buy-to-let market. For example, the calibration of policies illustrated would likely not have constrained buy-to-let lending — relatively small amounts were extended above a 90% LTV. The absolute impact of the policy on the mortgage market would have been as shown in **Table 2**, but that would have represented a smaller percentage of the total mortgage market.
- **A rise in buy-to-let lending:** if there was a limit in place for owner-occupied lending but not for buy-to-let then there could have been some substitution. If this effect was sufficiently strong, the fall in advances and lending shown in **Table 2** could have been completely offset by a pickup in buy-to-let lending. The limit would then have had a limited aggregate impact on the housing market. To get this outcome, buy-to-let lending would have had to be significantly higher than actually seen in 2006–07.

### Short-run effect on GDP

For some calibrations of both tools, 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 3** shows a range of estimates of the impact on GDP at the end of the period for the policy actions illustrated above. The range reflects different modelling approaches of how LTV or DTI limits feed into credit

**Table 3** Estimated impact of LTV and LTI limits on short-run GDP

1986–88	Per cent reduction in GDP at end of period with policy in place <sup>(a)</sup>
Share permitted with LTV>90%	
45%	0
40%	0.02–0.12
35%	0.06–0.33
<hr/>	
2006–07	
Share permitted with LTV>90%	
20%	0
15%	0.01–0.06
10%	0.06–0.28
<hr/>	
2014 Q2–2017 Q1	
15% permitted with LTI>4.5	
Base case	0
Upside scenario	0.06–0.25

Source: Bank calculations.

(a) Includes impact on housing investment due to fewer transactions.

conditions across the whole mortgage market and how monetary policy might react.<sup>(1)</sup> The ranges do not capture the uncertainty around each of those modelling approaches.

### Amplification and expectations

The analysis does not take into account the amplification mechanism illustrated in **Figure 1** between lending, house prices and expectations. In particular, it does not include:

- **The impact of the collateral channel.** If house prices rose less quickly as a result of a policy action, existing homeowners' 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 or DTI 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 or DTI limit. For example, lenders might choose to operate with a buffer, so extend fewer high LTV or DTI mortgages than permitted under the policy; borrowers

(1) The modelling 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 3** above shows the full range of impacts from the different modelling approaches.

might view a policy change as a signal to limit their own mortgage borrowing to below a certain LTV or DTI threshold; and investors driven by expectations of capital gains might have less incentive to enter the market.

As outlined in the main text, housing tools 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 current environment and outlook for the housing market. 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 tools

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 and DTI limits. As with the equivalent indicators for the CCB 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 tools in response. The indicators will be considered alongside those for the CCB and SCRs, market and supervisory intelligence, and 'stress tests' to judge whether capital tools or these housing tools 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 on the Bank's website every quarter.<sup>(1)</sup>

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.

### 4.1 High-level considerations

Core indicators should highlight the need to tighten or loosen limits on LTV or DTI ratios 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 markets.

LTV and DTI 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.<sup>(2)</sup> Moreover, the larger the increase in prices, the larger the potential fall.<sup>(3)</sup> 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 tools 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 two types of tools 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 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 limit may inevitably become more binding during an upswing as house price growth outstrips income growth which may lessen the need for further tightening of the tool. However, a tighter DTI limit may also be warranted if there is an increase in risks to household income.

Core indicators should also track developments in different segments of the mortgage and housing markets. The LTV and DTI tools apply to owner-occupied mortgages.<sup>(4)</sup> Nonetheless, the scale and nature of buy-to-let activity makes it a potential amplifier of housing and credit cycles: any increase in buy-to-let lending in an upswing will add further pressure on house prices, which will likely prompt owner-occupiers to take on larger loans. As an investment asset in which landlords seek not only rental returns but also capital gains, demand for buy-to-let lending is likely to be cyclical. Buy-to-let lending can also pose direct threats to lender balance sheets in the same way as lending to

(1) See [www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx](http://www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx).

(2) Barrell *et al* (2009), Borio and Drehmann (2009) and Mendoza and Terrones (2008) suggest that house prices are an indicator of future financial crises.

(3) 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.

(4) 99.4% of regulated mortgages go to owner-occupiers as a small share of buy-to-let borrowers fall under conduct regulation. However, for the purposes of describing the indicators the term regulated and owner-occupied mortgages are used interchangeably.



owner-occupiers. Further, owing to the prevalence of interest-only mortgages among buy-to-let lending, such mortgages make up a larger share of lender mortgage portfolios than the flow of new buy-to-let mortgages might suggest because of their slow amortisation rate.

These high-level considerations suggest that an appropriate set of indicators for the housing tools should include, both for owner-occupied and buy-to-let mortgages: measures on lender balance sheet stretch to inform in particular LTV limits; measures on household balance sheet stretch to inform in particular DTI limits; and measures relating to conditions and terms in the housing and mortgage markets, including prices, to assess amplification channels.<sup>(1)</sup> **Table A** on page 33 lists the FPC's core indicators for limits on LTV and DTI ratios, 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 Box 3 presents a case study assessing the performance of these indicators both prior to the recent financial crisis and in current conditions. 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.

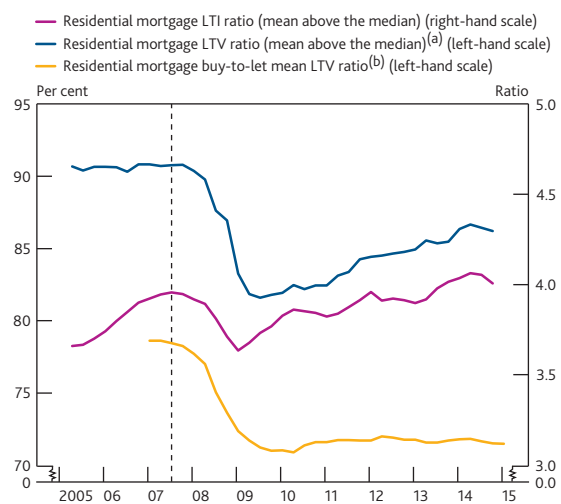
The indicators may also be useful in judging whether or not policy has been effective. Success in this context means reducing the risk of a major disturbance to the financial system, which has its roots in the housing market, without having a significant adverse effect on aggregate economic activity 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 rose following a limit on high LTV mortgages.

## 4.2 Lender balance sheet and household balance sheet stretch (indicators 1–3)<sup>(2)</sup>

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.<sup>(3)</sup> 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**).<sup>(4)</sup> 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, the two 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 which a longer time series is available.

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



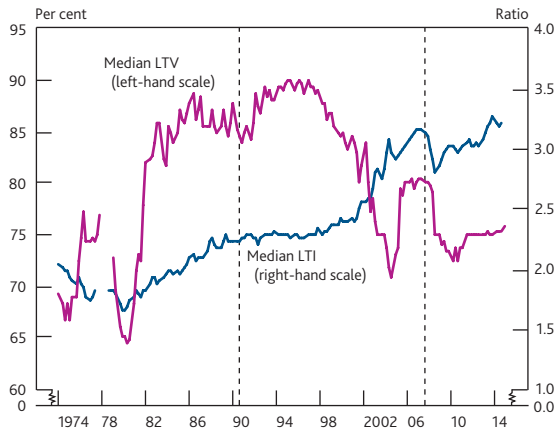
Sources: Bank of England, FCA Product Sales Data and Bank calculations.

- (a) 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). Data include regulated mortgage contracts only, and therefore exclude other regulated home finance products such as home purchase plans and home reversions, and unregulated products such as second charge lending and buy-to-let mortgages.
- (b) 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.

Complementary to these indicators on owner-occupied mortgages, the FPC will also look at **the average LTV ratio on buy-to-let mortgages**. At present, there is insufficient data on the distribution of new buy-to-let mortgages by their LTV ratio to accurately construct an indicator based upon the mean above the median. As better data on the buy-to-let market become available in future, this transformation of the data may be added to the indicator set. Data on LTI ratios and ICRs regarding the buy-to-let market are also limited. Such series may be added to the core indicator set in future as new data become available.

- (1) The core indicators on the buy-to-let sector could also inform FPC Recommendations on buy-to-let tools.
- (2) 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.
- (3) Currently, data on LTI ratios on new mortgages are more readily available; hence, at present, the indicators focus upon LTI ratios rather than DTI ratios. In 2015, FCA Product Sales Data will start including additional data fields covering the overall indebtedness of borrowers. This may enable DTI ratios to be tracked more closely in future.
- (4) 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 regulated mortgages (excluding buy-to-let mortgages).

**Chart 4** LTV and LTI ratios on UK mortgage lending: overall medians<sup>(a)</sup>



Source: Council of Mortgage Lenders.

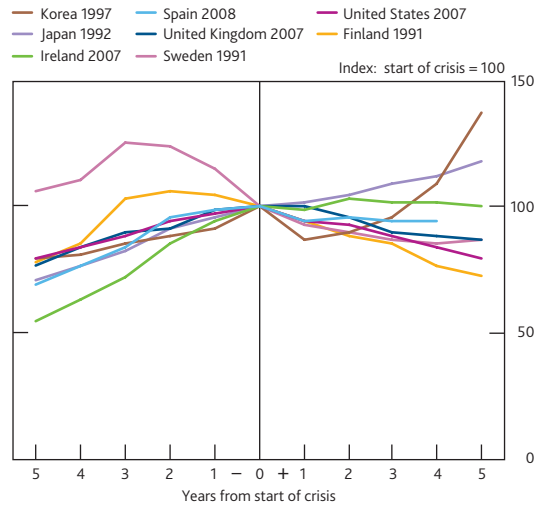
(a) Median LTV (respectively LTI) ratio for mortgage advances for house purchase (excludes remortgages).

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 tools. Moreover, household credit growth tends to be a leading indicator of crises.<sup>(1)</sup> During times of rapid credit expansion, a tightening of housing tools might be warranted to ensure that mortgage lending does not become unduly risky, pointing to the usefulness of monitoring **nominal household credit growth (2)**.

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 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

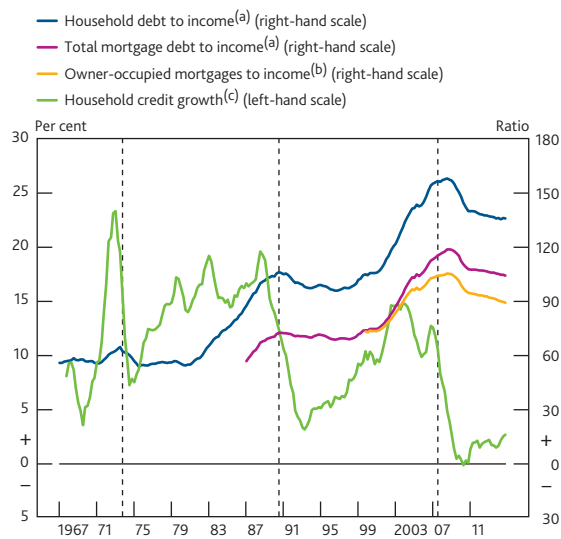
**Chart 5** Household DTI ratios before and after major crises<sup>(a)</sup>



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).

**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) 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.  
 (c) The twelve-month nominal growth rate of credit. Defined as the four quarter cumulative net flow of credit divided by the stock in the initial quarter. Credit is defined as all financial liabilities of the household sector.

financial system, for example a deepening of financial intermediation.

(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.

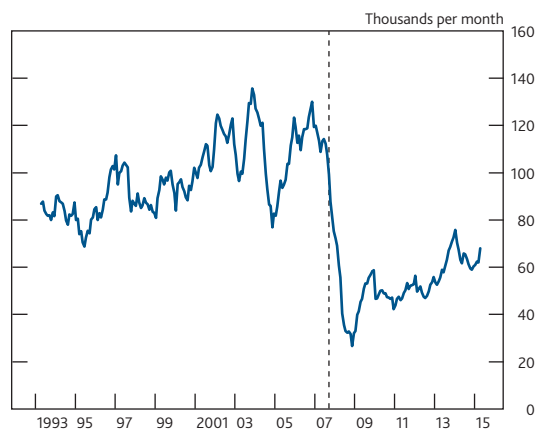


The FPC will also monitor the **ratio of household mortgage debt to household income**, including the relative shares of owner-occupier and buy-to-let borrowers (**Chart 6**). These indicators cover the different portions of lending over which the FPC's housing tools operate. Furthermore, the difference 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 regulated 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 recent 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** UK mortgage approvals<sup>(a)</sup>



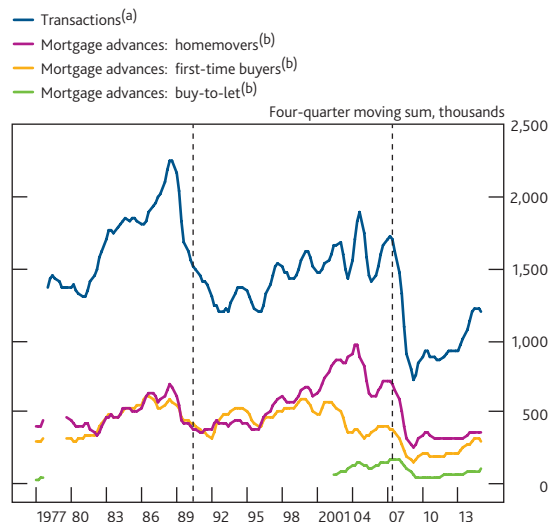
Sources: Bank of England and Bank calculations.

(a) Number of new loans secured on dwellings approved for house purchase net of cancellations, seasonally adjusted.

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, homemovers and buy-to-let investors (**Chart 8**). Transactions net of these three series give an indication of the level of cash purchasers in the market.

**Chart 8** UK housing transactions and mortgage advances for house purchase



Sources: Council of Mortgage Lenders, Her Majesty's Revenue and Customs and Bank calculations.

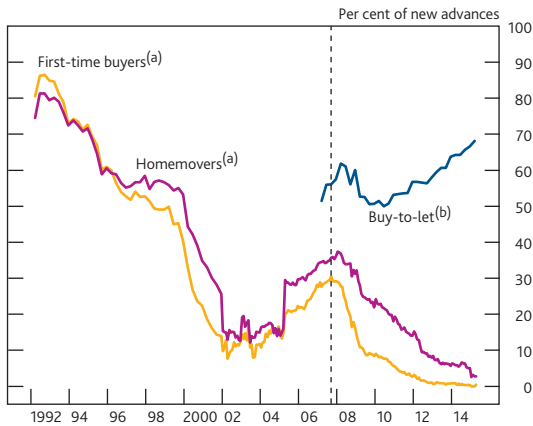
- (a) The number of houses sold/bought in the current and preceding three quarters is sourced from HMRC's Land Transaction Return. From 2008 the Return excluded properties priced at less than £40,000 (2006 and 2007 data have also been revised by HMRC to correct for this). Data prior to 2005 comes from 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 **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. A plan to repay an interest-only loan may involve investing in risky assets, whose price may move in tandem with, and be more volatile than, the value of housing.<sup>(1)</sup> Furthermore, highly levered interest-only borrowers remain highly levered as they do not pay down debt until maturity. These factors may mean that interest-only mortgages 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

(1) Lenders are permitted to offer interest-only mortgages only when borrowers have a credible plan to repay the mortgage capital.

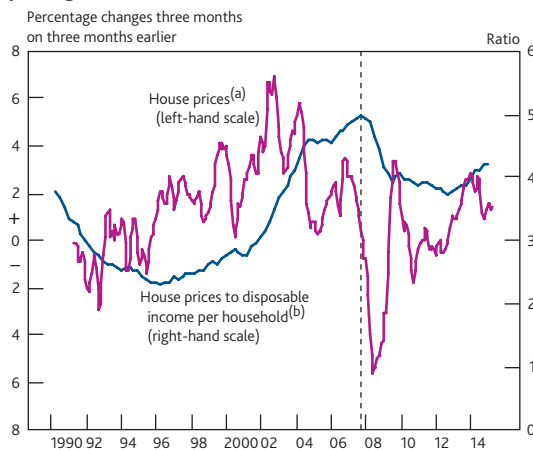
**Chart 9** Share of new UK mortgages that are interest only



Sources: Bank of England, Council of Mortgage Lenders (CML) 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, Nationwide, ONS, Bank Calculations.

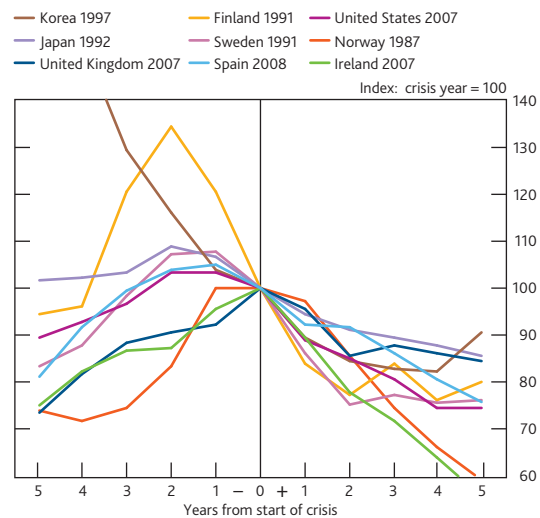
- (a) House prices are calculated as the mean of averages of United Kingdom house price as reported by the Nationwide and Halifax building societies.
- (b) The ratio is calculated using gross disposable income of the UK household and non-profit sector per household as the denominator. Aggregate household disposable income is adjusted for financial intermediation services indirectly measured (FISIM). Historical UK household population estimated by assuming linear growth in Northern Ireland household population between available data points.

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.<sup>(1)</sup> 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.

**Chart 11** House price to income ratios before and after major financial crises<sup>(a)</sup>



Sources: OECD and Bank calculations.

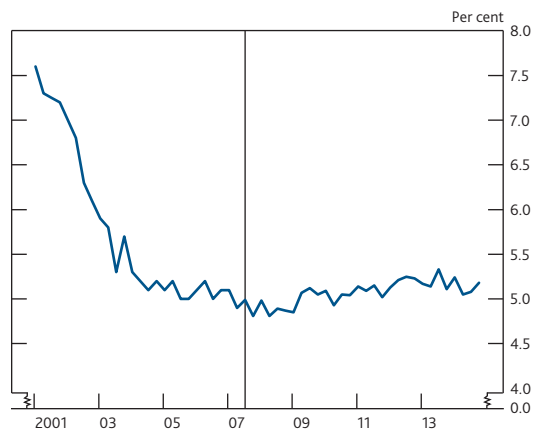
- (a) House prices to income as compiled by the OECD. The years beside the country names give the dates of the first year of a banking crisis, based on Reinhart and Rogoff (2009).

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

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

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.

**Chart 12** UK gross annual rental yield<sup>(a)</sup>



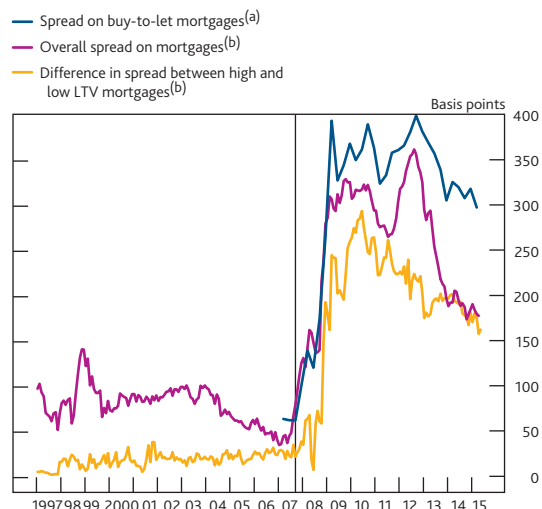
Source: Association of Residential Letting Agents.

(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.

**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 recent years, **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. The **difference in the spread between new high and low LTV mortgages<sup>(1)</sup>** is a means to capture how risk is priced.<sup>(2)</sup> 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 in times of high house price inflation. 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.

**Chart 13** Spread on new UK mortgage lending and difference between spreads, on high and low LTV UK mortgages



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

- (a) 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.
- (b) 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 two-year fixed rate mortgages less the 75% LTV two-year fixed rate.

The difference in spreads was stable and near zero prior to the recent financial crisis in the United Kingdom (**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.

#### 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 tools 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** on page 33), 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.

- (1) For the aggregate mortgage market this is the difference in the rates charged on 75% and 90% LTV mortgages. For buy-to-let borrowers 90% LTV mortgage products are generally not available and this differential is not considered separately.
- (2) Data are not currently available for the relative spread on mortgages across LTI ratios. However, an indicator based on these mortgages would be added to the set of core indicators in the future should the practice become standard and data becomes available.

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 recent 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.<sup>(1)</sup>

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*.

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(1) Some evidence of the contribution 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 tools are important to the FPC's ability to meet its objectives. The Government has given the FPC Direction powers over LTV and DTI limits. This Policy Statement sets out how the FPC envisages each tool 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 tool.

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<sup>(a)</sup>

Indicator	Average, 1987–2006 <sup>(b)</sup>	Average 2006 <sup>(c)</sup>	Minimum since 1987 <sup>(b)</sup>	Maximum since 1987 <sup>(b)</sup>	Previous value (oya)	Latest value (as of 19 June 2015)
<b>Lender and household balance sheet stretch</b>						
1 LTI and LTV ratios on new residential mortgages						
Owner-occupier mortgage LTV ratio (mean above the median) <sup>(d)</sup>	90.6%	90.6%	81.6%	90.8%	85.5%	86.2% (2014 Q4)
Owner-occupier mortgage LTI ratio (mean above the median) <sup>(d)</sup>	3.8	3.8	3.6	4.1	4.0	4.0 (2014 Q4)
Buy-to-let mortgage LTV ratio (mean) <sup>(e)</sup>	n.a.	n.a.	70.9%	78.6%	71.8%	71.5% (2015 Q1)
2 Household credit growth <sup>(f)</sup>	10.3%	11.2%	-0.1%	19.6%	1.5%	2.7% (2014 Q4)
3 Household debt to income ratio <sup>(g)</sup>	108.9%	149.6%	87.7%	158.0%	135.9%	135.8% (2014 Q4)
of which: mortgages <sup>(g)</sup>	77.0%	109.5%	56.8%	118.8%	105.5%	104.3% (2014 Q4)
of which: owner-occupier mortgages <sup>(h)</sup>	86.1%	100.4%	72.8%	105.4%	91.1%	89.2% (2014 Q4)
<b>Conditions and terms in markets</b>						
4 Mortgage approvals <sup>(i)</sup>	97,940	118,991	26,658	135,579	63,055	68,076 (Apr. 2015)
5 Housing transactions <sup>(i)</sup>	129,015	139,007	51,700	220,909	103,030	97,610 (Apr. 2015)
Advances to homemovers <sup>(k)</sup>	48,985	59,342	14,300	93,500	28,900	25,800 (Apr. 2015)
% interest only <sup>(l)</sup>	53.3%	31.0%	2.6%	81.3%	5.9%	2.7% (Apr. 2015)
Advances to first-time buyers <sup>(k)</sup>	39,179	33,567	8,500	55,800	24,800	22,400 (Apr. 2015)
% interest only <sup>(l)</sup>	52.1%	24.0%	0.0%	87.9%	0.4%	0.4% (Apr. 2015)
Advances to buy-to-let purchasers <sup>(k)</sup>	9,903	12,931	3,603	16,230	7,500	8,100 (Apr. 2015)
% interest only <sup>(m)</sup>	n.a.	n.a.	50.0%	66.7%	63.7%	66.7% (2014 Q4)
6 House price growth <sup>(n)</sup>	1.8%	2.2%	-5.6%	7.0%	2.1%	1.4% (2015 2015)
7 House price to household disposable income ratio <sup>(o)</sup>	3.2	4.8	2.3	5.0	4.0	4.2 (2014 Q4)
8 Rental yield <sup>(p)</sup>	5.8%	5.1%	4.8%	7.6%	5.1%	5.2% (2014 Q4)
9 Spreads on new residential mortgage lending						
All residential mortgages <sup>(q)</sup>	81 bps	50 bps	34 bps	361 bps	205 bps	177 bps (Apr. 2015)
Difference between the spread on high and low LTV residential mortgage lending <sup>(q)</sup>	18 bps	25 bps	1 bps	293 bps	192 bps	162 bps (May 2015)
Buy-to-let mortgages <sup>(r)</sup>	n.a.	n.a.	62 bps	399 bps	325 bps	297 bps (2015 Q1)

(a) A spreadsheet of the series shown in this table is available at [www.bankofengland.co.uk/financialstability/Pages/fpc/coreindicators.aspx](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 ratio above 10x). Data include regulated mortgage contracts only, and therefore exclude other regulated home finance products such as home purchase plans and home reversions, and unregulated products such as second charge lending and buy-to-let mortgages. 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 are categorical: the share of mortgages with LTV ratio less than 75%; between 75% and 90%; between 90% and 95%; and greater than 95%. An approximate mean is calculated by giving these categories weights of 70%, 82.5%, 92.5% and 97.25% respectively. Series starts in 2007. Sources: Bank of England and Bank calculations.

(f) The twelve-month nominal growth rate of credit. Defined as the four-quarter cumulative net flow of credit divided by the stock in the initial quarter. Credit is defined as all financial liabilities of the household and non-profit sector. Sources: ONS and Bank calculations.

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

(h) 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. Series starts in 1999. Sources: Council of Mortgage Lenders, ONS and Bank calculations.

(i) Number of new loans secured on dwellings approved for house purchase net of cancellations, seasonally adjusted. Series starts in 1993. Sources: Bank of England and Bank calculations.

(j) 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.

(k) The number of new mortgages advanced for house purchase in the current month. Buy-to-let series starts in 2001. Sources: Council of Mortgage Lenders and Bank calculations.

(l) 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 2015 where the CML switches source. Data prior to 2002 are at a quarterly frequency.

(m) The share (in volume terms) of unregulated mortgages that are interest only. Note: unregulated mortgages are used here as a proxy for buy-to-let, but this will include other types of unregulated mortgages such as second charge. These 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.

(n) House prices are calculated as the mean of the average UK house price as reported by the Nationwide and Halifax building societies. Growth rate calculated as the percentage change three months on three months earlier. Series starts in 1991. Sources: Halifax, Nationwide and Bank calculations.

(o) 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). Historical UK household population estimated using annual GB data and 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, Nationwide, ONS and Bank calculations.

(p) 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. Series starts in 2001. Source: Association of Residential Letting Agents.

(q) 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.

(r) 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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