



BANK OF ENGLAND

Speech

Housing tools revisited

Speech given by

Sir Jon Cunliffe, Deputy Governor Financial Stability, Member of the Monetary Policy Committee, Member of the Financial Policy Committee and Member of the Prudential Regulation Committee

Bank of Portugal, Lisbon

3 July 2019

I am grateful to Iren Levina and Katie Low for their help in preparing these remarks.

I am very pleased today to be in Lisbon. The Bank of England has a long history. But we are relative teenagers compared to the Aliança Inglesa or Anglo-Portuguese alliance dating back to 1373 – that is, I think, the oldest alliance still in force in the world.

We do however have a long history for a central bank. We were over 150 years old by the time the Banco de Portugal was founded in 1846.

But a long history is not always a good thing.

By 1846 the UK had on average experienced at least one financial crisis per decade since the Bank was founded in 1694.¹ And in 1846 the end of a speculative boom in railway investment coupled with a poor harvest was about to precipitate another – amplified by currency laws introduced in 1844 that restricted the Bank's ability to provide liquidity in a crisis.²

Recent work at the Bank of England on the Bank's response to the crisis that unfolded in 1847 suggests that although we appear to have rationed credit we were beginning to edge towards assuming a more unequivocal lender of last resort role – though it took a few more crises before that lesson was fully learned.³ As our financial systems have evolved, we have a long history of dealing with financial crises and of learning, sometimes slowly and painfully, their lessons.

I want to talk today about what we have done to learn and to institutionalise some of the lessons of the financial crisis of 2008 and particularly about the evolution of the new, statutory Committee of the Bank, the Financial Policy Committee (FPC) that was established in 2013 and charged with maintaining financial stability in the UK.

The FPC was set up along similar lines as the Monetary Policy Committee (MPC) which is charged with maintaining price stability. But price stability can be measured and very clearly defined – in the UK the Government sets the MPC the target of 2% Consumer Price Inflation at all times. Financial stability is a much more difficult concept to define. You know it by its absence of course. But by then it is usually too late.

So it is fair to say that over the first years of the FPC we have been 'learning by doing', building out our thinking on what we should care about as we have been identifying and mitigating risks – and setting out our thinking so that stakeholders understand why we have acted as we have and how we are likely to act in the future.

¹ Based on 17 possible UK financial crises between the Bank's foundation and 1846/1847 cited in Ashton (1959), Hoppit (1986) and Dimsdale and Hotson (2014).

² Huang and Thomas (2016).

³ Anson et al (2019) and Anson et al (2017).

Almost exactly five years ago the FPC took its first action directed at housing related debt and, crucially, action aimed at the resilience of borrowers rather than lenders. In doing so, the FPC adopted a broad view of its responsibilities – one that went beyond the risks and resilience of the financial system to the risks of leverage in the economy more generally.

I want to look today at the reasoning behind that action and the evidence that has accumulated since about the risks the FPC was aiming to contain and the effectiveness of the action it took.

Macroprudential for the whole economy

To put that action in context, let me start with a very high level sketch of what in my view we mean by financial stability.

Financial stability in essence is ensuring that the financial system and the real economy are able to absorb the ups and downs of the financial cycle. And, by extension, that the financial cycle does not amplify the troughs of the business or economic cycle or more generally disrupt the economy. We care about the ups, the peaks of the financial cycle because higher peaks are likely to result in higher falls and so, require higher resilience.

By financial cycle I mean essentially the build-up and contraction of credit or leverage in the economy and in the financial system. The rise and fall of asset prices – both financial and physical assets – does of course matter. But it matters much more when assets are financed by credit.⁴

The term ‘financial cycle’ implies some smooth predictable sine wave. Life, I am afraid, is not like that. Financial cycles do not follow nice patterns: they are only ‘cycles’ in the sense that we can observe periods of credit growth followed by periods of contraction.

The growth of credit in an economy tends to build up and accelerate over time and then contract as optimism about the future income streams and asset values waxes and wanes. And there are mechanisms, such as collateral values, endogenous to the creation of credit that reinforce both the upswing and the downswing. Much of achieving financial stability is about good regulation of banks – ensuring they have enough capital and liquidity to withstand stress in the market or economy, and ensuring that they aren’t running risks that will amplify a downturn, for example through weak underwriting standards or opaque structures.

⁴ Jordà et al (2015) demonstrate that asset price bubbles fuelled by credit booms increase financial crisis risks the most. Credit-financed housing price bubbles are shown to present a particular risk. In contrast, equity price bubbles – particularly those unaccompanied by rapid credit growth – are typically less damaging and there have been numerous equity price bubbles that did not turn into financial crisis episodes.

For non-bank financial firms, our focus has been more on their potential to impact others in the market – how under stress they can affect liquidity and pricing in the market, which can affect the financial system more generally.

Market-based finance has grown rapidly and brings a welcome diversity to the sources of funding available to the real economy. But the structure of some investment funds – investing in assets with poor underlying liquidity in stress while at the same time offering daily redemption to investors – introduces liquidity risk. If many investors want to redeem within a short period, markets may not be able to absorb the necessary asset sales.

We have seen some idiosyncratic instances of such a dynamic in the UK – with funds having to gate investors as a result.

These have not given rise to financial stability risks. But if we saw this happen on a wider front, if for example investors lost confidence in a less liquid asset class, there is a risk of redemption pressures that could not easily be met and consequently contagion and firesales that could damage the financial system. These are international markets so we need to work internationally to assess these risks and any structural remedies that might be warranted.

Risks to financial stability don't all arise in the financial system, however. There is a borrower for every lender. Over-indebtedness in the real economy can amplify economic downturns. That in turn could also lead to larger losses for lenders than the initial downturn alone.

The borrower or the lender?

If there is risk in a bank lending to a borrower, should an FPC policy focus on the lender or the borrower? Our approach has been that the policy should address the vulnerability as directly as possible. In principle it is most efficient and effective to act on the origin of the vulnerability. Lenders and borrowers do not respond to credit cycle shocks in the same way. If the risk originates in the lenders' balance sheet, if lenders are not able to absorb losses in a severe but plausible stress, action should focus on reinforcing the resilience of the lenders to losses.

It is possible, however, that the risk comes mainly from the borrowers' balance sheets, that they may continue to repay lenders but reduce other spending in the economy making the downturn and the eventual losses in the financial system worse. In that case, action to reinforce lender resilience will not address the risk or only do so ineffectively and inefficiently.

Borrower-based tools

Against that background, let me say a little more about the FPC's housing tools and how they have operated in practice.

The FPC's housing tools

In the five years after the financial crisis, housing market activity and house price growth was very subdued. But by 2013 both price growth and mortgage transactions began to pick up rapidly.

In 2014 in the UK, house prices grew by 9% in the year to Q1 – twice as fast as incomes.⁵ Mortgage approvals had risen from around 50,000 per month in June 2012 to over 70,000 in January 2014. And, very importantly, the share of those mortgages at high loan-to-income (LTI) ratios was rising. The aggregate debt to income ratio for UK households had fallen from its crisis peak but remained high relative to historical averages and international comparators.

To be sure, we had not reached the rate of increases in house prices relative to earnings and in mortgage debt that we had seen before the crisis and in other episodes in the UK. But there was a risk that we were seeing a release of demand that had been pent up in the years following the crisis – years in which housing supply had also grown very weakly.⁶

In response, the FPC introduced two new policies on household mortgage lending.

The first was a loan to income (LTI) flow limit that limited the proportion of mortgages with LTI ratios of 4.5 or higher to 15% of new mortgages.

The second was an affordability test for borrowers. This test had recently been implemented in the UK by the Financial Conduct Authority as a consumer protection measure.⁷ But the FPC recommended that the calibration of the test should take account of macro-prudential risks; we recommended that lenders assess whether borrowers could still afford their mortgages if interest rates were to increase by 3 percentage points.⁸

A number of factors pointed to the use of borrower-based tools.

⁵ There are a range of house price indices in the UK. In 2014, the Bank of England's policy committees typically used the average of Halifax and Nationwide price indices, quoted in the text. Since then they have switched to using the ONS's measure which was a little lower at the time – showing house price growth of 6%.

⁶ UK households have been moving, on average, once every 10 years in the decade prior to the crisis whereas in the years following that had risen to once every 17 years (Cunliffe 2014). Less than 150 thousand private dwellings, on average, were built in the UK between 2005 and 2014 – compared to estimates that 200-250 thousand that would be needed to keep up with growing demand (Barker 2004).

⁷ The FCA carried out its Mortgage Market Review over 2011 to 2012. The recommendations were implemented in early 2014 and required lenders to test the affordability of new loans. The test was not prescribed by the FCA but rather for each lender to implement their own.

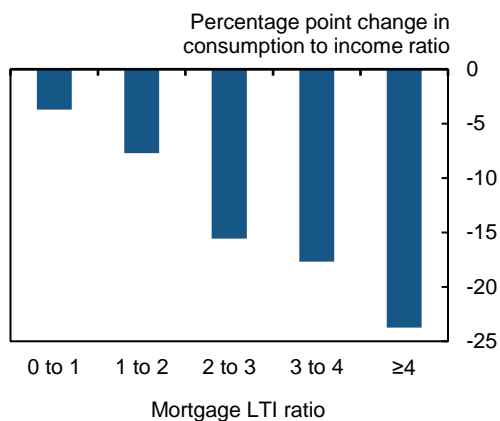
⁸ In 2017 the FPC clarified that the 3pp stress should apply to the reversion rate at the moment of origination.

The stress test on the major banks then in train indicated that they had sufficient capital to absorb very major losses from their mortgage portfolios.⁹ The risks did not seem to lie primarily on the lender side. And the experience in the UK, with full recourse mortgages was that households would do everything possible to pay their mortgages, cutting consumption to do so.¹⁰

But even though, as a result, mortgage defaults were relatively low in the crisis, high mortgage debt did appear to have had an impact more generally. Evidence from the crisis supported the view that more debt is associated with deeper downturns.

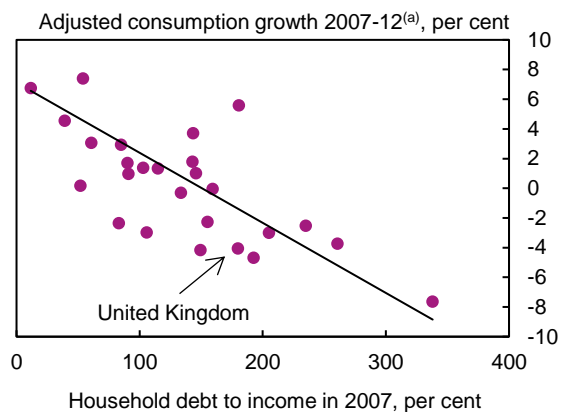
- Bank research showed that highly indebted households in the UK cut consumption more sharply over 2007 to 2009 (Chart 1).¹¹
- And during the global financial crisis, countries with higher aggregate debt levels relative to incomes had deeper falls in aggregate consumption and hence deeper downturns (Chart 2).

Chart 1. Change in consumption relative to income by LTI between 2007-09^{(a)(b)(c)}



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

Chart 2. Higher household indebtedness was associated with sharper falls in consumption during the crisis



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

Our aim was to guard against an upside risk. In 2014 the Bank's Monetary Policy Committee's central forecast was that in the medium term house price inflation would fall back and rise broadly in line with

⁹ The 2014 stress test was based on a scenario, in which house prices fell by 35% and unemployment increased to 12%.

¹⁰ Cumulative losses on mortgages over 2009 to 2013 were very small, at around 0.3% of outstanding balances – compared to around 25% for consumer credit. They were somewhat higher in the early 1990s, when unemployment rose higher than in the crisis.

¹¹ Bunn and Rostom (2014).

nominal incomes. If that were to happen, we expected the impact of the FPC's borrower-based policies to be small.

But while this was the central case, the FPC judged that there was a material upside risk of mortgage borrowing growing more rapidly and house prices increasing faster relative to earnings. In that case, the proportion of lending at higher LTI multiples could increase sharply, leading to an increase in the cohorts of highly indebted households and as a consequence greater macro-economic and macro-financial vulnerability in stress.

So we introduced the policies to insure against a material loosening in underwriting standards that would lead to a significant increase in the number of highly indebted households.

The action was a major development for the FPC in that it addressed directly a credit related vulnerability on borrower as opposed to lender balance sheets. The Committee debated vigorously at the time whether such action fell within its responsibilities or whether it should confine itself more tightly to the risks and resilience within the financial system.

It concluded, rightly in my view, that acting to prevent the possible sharp increase in highly indebted households was part of its statutory responsibility.¹² We made it very clear at the time that our objective was to address aggregate high indebtedness, not house price growth.

The Committee set out at the time in detail the reasons for the policy and its cost-benefit analysis. But it is important we continue to develop the analysis and evidence of why the policy makes sense and what impact it has had – to ensure we remain confident that the cost-benefit analysis stacks up.

That of course is true of all FPC policies but clear, regular public communication of the costs and benefits of macroprudential policies is particularly important in this area given the more direct focus on households as opposed to banks.

The evolving evidence base for the tools

First, the evidence base. Since the FPC introduced the borrower-based tools, there has been further work by central banks and academics on this link between debt and reduction of consumption in stress.

Some of this work adds to the evidence we already had. There is now more evidence that higher household debt is associated with bigger consumption cuts in a shock.

¹² As set out in Section 9C of the Bank of England Act 1998, as amended by the Financial Services Act 2012: *The responsibility of the Committee in relation to the achievement by the Bank of 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. Those systemic risks include, in particular— (a) systemic risks attributable to structural features of financial markets, such as connections between financial institutions, (b) systemic risks attributable to the distribution of risk within the financial sector, and (c) unsustainable levels of leverage, debt or credit growth.* The FPC was subsequently – in 2015-16 – given explicit powers of direction over LTV and DTI limits.

For example, micro data studies from the UK, US, Denmark and Norway have all found statistically significant correlations between higher levels of household debt and the size of consumption cuts in a shock.¹³ And macro studies have also found correlation between rapid credit growth and the severity of downturns.¹⁴

But new studies have also sought to deepen the knowledge base. In particular, they have looked at *why* more highly indebted households cut consumption in response to shocks – the channels through which the observed association is working.

For example, there could be debt financed ‘over-consumption’ prior to a downturn that is then cut back when expectations adjust to reality or credit becomes unavailable. This channel might work directly through unsecured consumer borrowing or through mortgage financed borrowing to consume.

Alternatively, there are channels through which higher levels of debt constrain household budgets without appealing to ‘over-consumption’: some indebted households may be unable to consume as much as they would like in a downturn because they do not have a sufficient buffer of liquid savings and find themselves unable to access additional credit when they need it the most. This situation is more likely when falls in house prices reduce the value of the borrower’s collateral. The situation is also likely to be exacerbated if the downturn is accompanied by rising uncertainty. The combination of rising uncertainty and credit constraints would tend to lead to further reductions in spending as households build precautionary buffers. This is likely to be particularly true when there is increased uncertainty about unemployment.¹⁵

The literature suggests that both channels can be important. For example, Danish research finds evidence in favour of over-consumption in Denmark over 2003 to 2009.¹⁶ This captures consumption financed by mortgage equity withdrawal or second mortgages, although the results may in part be driven by consumer credit, as the study does not distinguish between mortgage debt and consumer credit. The authors of the study think of the subsequent cuts in consumption as ‘spending normalisation’.

In the UK, however, research shows that a credit availability channel is best able to explain the historical movement between leverage and consumption.¹⁷ And studies in the US point to a range of channels, including credit availability and liquid assets.¹⁸

This variation in findings is not surprising. One would expect the channels to vary over time and across countries. But what does it mean for policy?

¹³ For example Andersen et al (2016), Kovacs et al (2018), Dynan and Edelberg (2013) and Fagereng and Halvorsen (2016).

¹⁴ For example Bridges et al (2017) and Jorda et al (2016).

¹⁵ For example, in Japan, Nakajima (2018) finds that precautionary saving – in particular due to concerns about potential unemployment and old age – played a significant role in explaining consumption cuts by highly indebted households.

¹⁶ Andersen et al (2016).

¹⁷ Kovacs et al (2018).

¹⁸ Dynan and Edelberger (2013) and Baker (2018).

In 2014, the FPC introduced the borrower-based tools to guard against an increase in the extent to which highly indebted households could amplify macroeconomic downturns. These tools could achieve this goal in a number of ways. By constraining the increase in the aggregate number of highly indebted households, the tools reduce the proportion of households that could have insufficient liquid assets or lose access to credit in the event of a shock. And by providing some check, in aggregate, on excessive credit growth relative to income, these tools could also provide benefits in the event of debt-financed overconsumption, if it were driven by highly indebted households or looser underwriting standards.

Effectiveness of the policy

Turning to the effectiveness of the policies, a key question is whether the risk of sharp consumption cuts in a downturn due to high indebtedness is lower now than it would have been if the policies had not been in place? To answer that question, we need to examine how the distribution of indebtedness on the stock of mortgages has changed over time.

There is no way to examine that directly in the UK – unlike some other countries, we do not have access to comprehensive data, such as current income and debt levels, for all UK households. Instead, we use two approaches to estimate this: surveys and models combined with regulatory data. The Bank has excellent access to both:

- Many years ago, we set up our own survey of households in the UK – the NMG survey – to ask the questions that are most important to us. Every six months, a sample of six thousand households is asked questions about their financial position and outlook that help inform decisions by the FPC (and other Bank policy committees).¹⁹
- The Bank *does* receive comprehensive data about the flow of new mortgages.²⁰ And Bank staff have developed a model to use this – and information about how incomes are changing in the UK – to project the distribution of indebtedness relative to incomes in the stock of mortgages. A working paper on that modelling is being released today.²¹

We can use the surveys and models to estimate the distribution of current loan to income characteristics of the households with mortgages and compare that to the distribution in 2014. Surveys and model outputs involve uncertainty, for different reasons. But it is reassuring that in this exercise they give us broadly consistent results.

¹⁹ The survey is weighted to be representative of the age, gender, region, housing tenure and employment status distributions of Great Britain.

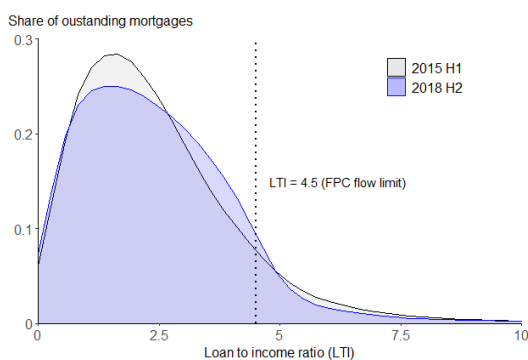
²⁰ The Bank does also receive a snapshot of the stock but some variables crucial for risk assessment are not captured in this.

²¹ Levina et al (2019).

The results show that the highly indebted tail has become a little smaller over since 2015. At the same time, the average debt level of the mass of the distribution has increased (Chart 3). If we draw on the literature on the links between debt and consumption cuts I mentioned earlier, and apply those coefficients to these stock distributions, we find that the two effects broadly offset each other.

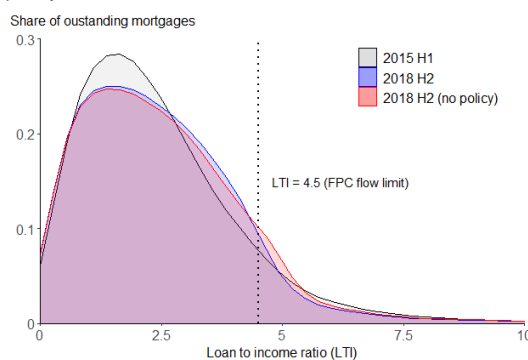
We can therefore I think conclude that the vulnerability from indebtedness has not changed markedly since 2014 – the increase in vulnerability that the FPC sought to prevent happening has not happened.

Chart 3. Estimated LTI distribution of the outstanding owner-occupier mortgages^(a)



Sources: FCA Product Sales Database, British Household Panel Survey (1991-2008)/ Understanding Society (2009-13) and Bank calculations.
 (a) The 2015 H1 distribution of stock LTI ratios is based on loan-level data containing outstanding loan values and borrower income at origination. Incomes are updated to 2015 H1 using panel data quantile regressions. The 2018 H2 distribution combines the 2015 H1 data on the stock of mortgages with loan-level data on the subsequent flow of new lending, also updated to 2018 H2. See Levina et al (2019) for methodology

Chart 4. Estimated LTI distribution of the outstanding owner-occupier mortgages – with and without FPC policy^(a)



Sources: FCA Product Sales Database, British Household Panel Survey (1991-2008)/ Understanding Society (2009-13) and Bank calculations.
 (a) The 2018 H2 counterfactual for stock LTI ratios takes the 2018 H2 distribution shown in Chart 3 and removes the estimated impact of FPC policy on the flow of new lending to date. The impact of FPC policy is estimated with a combination of model outputs and analysis of trends in high LTI lending over time.

Assessing what could have happened if we had not introduced these policies, or if the macro environment was different, is more difficult. But we can use the models to look at some counterfactuals, the ‘what ifs’ – modelling the stock under different macroeconomic scenarios and assumptions about lender and borrower behaviour and FPC policy.²²

House prices and mortgage activity have been relatively subdued over the past 5 years – with house price and income growth slightly lower than the central forecast prior to the introduction of housing tools in 2014 and markedly fewer housing transactions than we were expecting. So the policy impact – both costs and benefits – have been relatively small to date. What would mortgage indebtedness look like if the policy hadn’t been there: if house prices, and activity, had followed the paths they actually followed but the FPC policies had not been in place? We can estimate the distribution of LTI in the stock of borrowers today if the

²² See Levina et al (2019) for more detail on methodology.

policies had not been in place. The results suggest that in those circumstances the tail of highly indebted households would be slightly larger than it currently is (Chart 4). And, were a downturn to hit, that the impact of debt on consumption would be a little larger than today.

Looking forward, the impact of these policies will continue to depend on how house prices and incomes evolve.

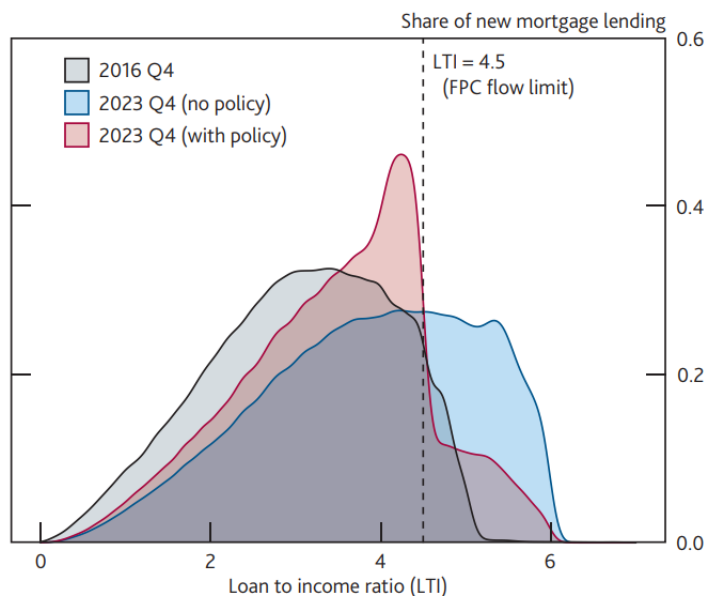
If house prices and incomes grow broadly at the same rate then the distribution of indebtedness in the flow of new mortgages will not change much – and hence the impact of policies on the flow will not be large. But we will continue to see a change in the distribution of the stock of mortgages for some time yet as newer, higher LTI mortgages gradually replace older, lower LTI mortgages.

If though, house price growth outpaces income growth in the future then the policies will have a greater impact.

Without the policies in place, if prices grew twice as fast as incomes – as they did over 2014 to 2016 – and activity rose to the pace we were forecasting in 2014, 40% of new mortgages would be at more than 4.5 times the borrower's income (Chart 5). Over time, this would lead to a significant increase in the share of households with higher debt to income. The models show that in such a case the fall in aggregate consumption in the event of an adverse shock could be up to around 20% larger than we find with our policies in place.

To be clear, such house price growth relative to earnings would not be at all unusual for the UK – over the five years leading up to the crisis, house prices grew at three times the rate of income growth and there were about 70% more mortgage approvals per month than we have seen since 2014. And in the late 1980s, house prices again grew at well over twice the rate of earnings.

Chart 6. LTI distribution of new mortgage lending^{(a)(b)}



Sources: FCA Product Sales Database and Bank calculations.
 (a) The Product Sales Database includes regulated mortgages only.
 (b) LTI distribution of new mortgage lending in 2016 Q4 and at the end of an 'upside' 7-year scenario, with or without FPC Recommendations in place.

There is a separate but related question about the extent to which the relatively subdued evolution of house prices and transactions between 2014 and 2019 was due to the FPC's policy, including a general signalling effect on indebtedness. But general economic developments (for example, weaker than forecast economic growth, the post referendum inflation squeeze on incomes, and general Brexit uncertainty) and housing policies beyond the central bank (such as changes to Buy-to-Let tax treatment) have probably played the bigger role. And the flow limit of 15% has never 'bitten' in aggregate – since the policy was introduced flows of new mortgages at or above four and a half times income have not exceeded 11%. We are doing more work to isolate the impact of these factors as part of the ongoing cost-benefits analysis underlying these tools.

Putting all of this together, I would conclude that the rationale for the FPC's action remains sound in the light of subsequent evidence and that the action itself was effective at preventing further build up in the tail of more indebted households, and more importantly that it continues to function as an insurance policy. More work is in train to assess whether the FPC's actions may have affected the evolution of house prices and transactions but even if we assume there was no broader impact of this kind, the work published by the Bank today suggests strongly that the policies have functioned as intended. They have restrained the build-up of more highly indebted households that would otherwise leave the economy and subsequently the financial system more vulnerable in a downturn.

There are two interesting postscripts to the FPC's 2014 actions.

First, the Committee when it took its decisions left open the possibility that these tools – LTI flow limit and affordability test – might be part of the time varying macro-prudential toolkit. Subsequent consideration by the Committee in 2017, concluded that while the calibration might need to be varied over time, the limits themselves functioned as necessary insurance and should be seen as part of the regulatory system rather than as temporary measures.

Second, at the time of the action, the FPC did not have powers of direction in relation to borrower focussed macro-prudential risks. The Committee's powers of direction were confined to bank capital. The FPC's actions in 2014 took the form of recommendations to the PRA and FCA under the Committee's general recommendation powers.

In response to a request from the Chancellor of the Exchequer to review its powers in relation to the housing and mortgage market and advise on whether any changes were necessary, later in 2014 the Committee recommended that it be given the power of direction in relation to debt to income and loan to value.²³ Parliament approved these new powers for the owner-occupier market in 2015.

Conclusion

There has, since the crisis, been a lively and often intense debate about the most appropriate allocation of macro-prudential responsibilities and powers between authorities in different jurisdictions. There is also currently a debate in train about the powers and responsibilities of central banks in different fields, including macro-prudential policy.

That is a subject for another, probably longer, speech. I would only point out that no matter how responsibilities are organised, there needs to be some mechanism for assessing and addressing the macro prudential risks that can flow from borrower balance sheets.

And that if this responsibility is allocated to a technocratic as opposed to a political authority, it is particularly imperative that there is maximum transparency and accountability around that authority's approach and justification for action. The FPC reviews its housing actions regularly and will publish the results of its 2019 review, including, as I have said, an updated cost-benefit analysis. The Bank of England work published today is, in the same way, intended to contribute to that necessary transparency and accountability.

I began this talk today by recollecting how the Bank had learned, slowly, from the crisis of 1846 about the need to support credit to the economy in a crisis rather than restrict it. I hope likewise, we have learned one of the lessons of the 2008 crisis that higher household indebtedness increases macroeconomic and macrofinancial vulnerability in a crisis and needs to be considered within macroprudential policies.

²³ The Committee has discretion to decide which types of debt to include – the 2014 measures only acted on owner-occupier mortgage debt.

References

- Andersen, Asger Lau, Charlotte Duus, and Thais Lærkholm Jensen (2016), Household debt and spending during the financial crisis: Evidence from Danish micro data, *European Economic Review*, 89, pp. 96-115.
- Anson, Mike, David Bholat, Miao Kang and Ryland Thomas (2017), The Bank of England as lender of last resort: new historical evidence from daily transactional data, *Staff Working Paper No. 691*, Bank of England.
- Anson, Mike, David Bholat, Miao Kang, Kilian Rieder and Ryland Thomas (2019), The Bank of England and central bank credit rationing during the crisis of 1847: frosted glass or raised eyebrows? *Staff Working Paper No.794*, Bank of England.
- Ashton, T. (1959), *Economic Fluctuations in England 1700-1800*, Clarendon Press, Oxford.
- Baker, Scott R. (2018), Debt and the Response to Household Income Shocks: Validation and Application of Linked Financial Account Data, *Journal of Political Economy*, 126 (40), pp. 1504-1557.
- Barker, Kate (2004), *Barker Review of Housing Supply*, HM Treasury, London.
- Bridges, Jonathan, Chris Jackson and Daisy McGregor (2017), Down in the slumps: the role of credit in five decades of recessions, *Staff Working Paper No. 659*, Bank of England.
- Bunn, Philip and May Rostom (2014), Household debt and spending, Bank of England *Quarterly Bulletin*, 54 (3), pp. 304-315.
- Cunliffe, Jon (2014), Momentum in the housing market: affordability, indebtedness and risks, *Speech at the Worshipful Company of International Bankers dinner*, London.
- Dimsdale, Nicholas and Anthony Hotson (2014), *British Financial Crises since 1825*, Oxford University Press, Oxford.
- Dynan, Karen and Wendy Edelberg (2013), The Relationship Between Leverage and Household Spending Behavior: Evidence from the 2007-2009 Survey of Consumer Finances, *Federal Reserve Bank of St. Louis Review*, 95(5), pp. 425-48.
- Fagereng, Andreas and Elin Halvorsen (2016), Debt and Household Consumption Responses, Norges Bank, *Staff Memo*.
- Hoppit, J. (1986), Financial Crises in Eighteenth-Century England, *The Economic History Review*, 39(1), pp. 39-58.
- Huang, Huaxiang and Ryland Thomas (2016), The ghost of crises past, present and future: The Bank Charter Act goes on trial in 1847, *Bank Underground*.
- Jordà, Òscar, Moritz Schularick and Alan M. Taylor (2015), Leveraged bubbles, *Journal of Monetary Economics*, 76, pp. S1-S20.
- Jordà, Òscar, Moritz Schularick and Alan M. Taylor (2016), The great mortgaging: housing finance, crises and business cycles, *Economic Policy*, 31 (85), pp. 107-152.
- Kovacs, Agnes, May Rostom and Philip Bunn (2018), Consumption Response to Aggregate Shocks and the Role of Leverage, *Discussion Papers 1820*, Centre for Macroeconomics (CFM).
- Levina, Iren, Robert Sturrock, Alexandra Varadi and Gavin Wallis (2019), Modelling the distribution of mortgage debt, *Staff Working Paper No. 808*, Bank of England.
- Nakajima, Jouchi (2018), The role of household debt heterogeneity on consumption: Evidence from Japanese household data, *BIS Working Paper No*