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New Forecast Scenarios for UK Mortgage Arrears and Possessions

Report

Janine Aron, Department of Economics, and Institute for New Economic
Thinking, Oxford Martin School, University of Oxford

John Muellbauer, Nuffield College, and Institute for New Economic Thinking,
Oxford Martin School, University of Oxford

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Department for Communities and Local Government
Eland House
Bressenden Place
London
SW1E 5DU
Telephone: 030 3444 0000

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Abstract

This report updates and extends the authors' previous paper on modelling and forecasting aggregate UK data on mortgage possessions (foreclosures) and mortgage arrears (payment delinquencies). The innovations include the treatment of difficult to observe variations in loan quality and shifts in forbearance policy by lenders, by common latent variables estimated in a system of equations for arrears and possessions, for quarterly data over 1983-2011. A second innovation is the theory-justified use of an estimate of the proportion of mortgages in negative equity, based on an average debt to equity ratio, as one of the key drivers of possessions and arrears. A third is the systematic treatment of measurement bias in the months in arrears measures. Finally, the model does not impose a proportional long-run relationship between possessions and arrears as assumed in the previous UK literature. A range of economic forecast scenarios for forecasts to 2015 reveals the sensitivity of mortgage possessions and arrears to different economic conditions, highlighting potential risks faced by the UK and its mortgage lenders. The base forecasts are substantially less pessimistic than the Council of Mortgage Lenders (CML) forecasts for 2012 made in December 2011.

Acknowledgements

This paper draws on our earlier report *Mortgage Possessions Statistics and Outlook: an Independent Review for the Minister for Housing/Department for Communities and Local Government, UK, May 2009*, superseded in July 2010 by <http://www.communities.gov.uk/publications/housing/modellingmortgagearrears>, and a working paper of the UK Spatial Economics Research Centre. Some of our models are estimated from unpublished Council of Mortgage Lenders (CML) data, and we are grateful to CML for making these data available. We are grateful for data advice and access to James Tatch of CML, and for data to Adrian Cooper of *Oxford Economics*. This research was supported in part by the Open Society Foundation and the Oxford Martin School.

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1. Introduction

We have re-estimated our system of equations for rates of 6 and 12 month mortgage arrears and possessions on data up to the third quarter of 2011. Previously we had run to the third quarter of 2009 (Aron and Muellbauer, 2010a, 2010b). Our forecasts of arrears and possessions (including voluntary possessions) to 2015 utilise a range of economic forecast scenarios based mainly on underlying forecast data from the *Office for Budget Responsibility (OBR)* but also from *Oxford Economics* for comparison. This reveals the sensitivity of mortgage possessions and arrears to different economic conditions, highlighting the potential risks faced by the UK and its mortgage lenders. Our models also throw light on the probable impact of policy measures.

There have been a number of data revisions which affect the estimates. The extra eight observations, together with the data revisions were helpful in making it possible to obtain more precise (and larger) estimates of the effect of the unemployment rate on possessions. These new estimates are more consistent with our work on regional data for England and Wales on court orders for mortgage possession, Aron and Muellbauer (2011a, 2011b). This change in the model means that the forecasts for future possession rates are a little more sensitive than before to differences in assumptions on the unemployment rate.

However, the biggest difference from the forecast scenarios we considered two years ago is that the rise in interest rates pencilled in by most forecasters has not occurred and most current forecasts see it as even further postponed into the future. The forecast rise in interest rates was the main reason why most of our forecast scenarios of two years ago showed an upward drift in possessions and arrears rates. On the base scenario taken from central forecasts made by the *Office for Budget Responsibility (OBR)*, the outlook for rates of possessions and arrears looks fairly flat in 2012 and drifts up in 2013 and 2014. Our forecast for the base scenario of the annual number of possessions in 2012, of around 36,000, contrasts markedly with the forecast of the Council of Mortgage Lenders (CML) at the end of 2011 of 45,000 for 2012.

We base the mortgage interest outlook (not forecast by the OBR) on the OBR's forecasts for Libor (London 3 month interbank rate) and our own assumptions on the spread between the mortgage rate and Libor. The net effect is little change in assumed mortgage rates between June 2011 and June 2014, as a slight increase in 2012 is reversed in 2013. In the base scenario, possessions in 2012 are forecast to be little changed from 2011

while the 6-month arrears rate is forecast to be a little higher at the end of 2012 than at the end of 2011, mainly due to higher unemployment. The combination of higher unemployment and of a small upward drift in the estimated proportion in negative equity is mainly felt in 2013. At the end of 2013, the 6-month arrears rate is forecast to be 3.5 percent higher than in 2011, and annual possessions are forecast as 10.6 percent higher than in 2011. Possessions numbers increase further in 2014 and 2015. They are forecast as 38 percent higher in 2015 than in 2011, as interest rates, which are assumed to start rising from 2013Q3, are not sufficiently offset by falling unemployment and a slightly faster rise in disposable income and in house prices. The 6-month arrears level stabilises in 2014 but then rises again in the base scenario in 2015 for similar reasons. The rise in household indebtedness forecast by the OBR also contributes to these forecast rises in default rates in the later part of the forecast period.

The details of the forecast scenarios examined are discussed in section 3, following section 2, where the model revisions due to fine-tuning the model on the additional data are explained. In section 4, the forecast results are discussed, and section 5 concludes.

2. Fine-tuning the model

2.1 Formulation of the arrears and possessions equations

The model was described in Aron and Muellbauer (2010 a, 2010b). The model is formulated in logs. There are three economic drivers: the debt-service ratio, the estimated fraction of households with negative equity and the unemployment rate. There are also two indicators which use dummy variables to capture shifts in 'loan quality' and in 'forbearance policy'. 'Loan quality' captures hard to measure factors which push arrears and possessions in the same direction. These include quality of lending in previous years, the strength of income support for borrowers with payment difficulties and access to refinancing possibilities. 'Forbearance policy' captures shifts which reduce possessions but raise arrears because higher levels of arrears are tolerated before possession proceedings are carried through. The parameters of the dummy variables are estimated jointly as each indicator enters all three of the equations for arrears and possessions.

Small changes from the previously estimated equations result from data revisions and the addition of eight quarters of data. Appendix 1 briefly explains the main data revisions. The variables in the model are defined in Table 2, and the parameter estimates from the extended data set are given in Table 3 and Table 4. One result is a notable increase in the estimated size and

precision of the effect of unemployment on the possessions rate. To compensate, the estimated effects on the rate of possession of the debt service ratio and of proportion of households with negative equity fall very slightly, though remaining highly significant. With the gain in precision, we took the opportunity of checking the lag structure of the unemployment effects in all three equations and confirm the previous findings.¹

We also checked in all three equations whether there is any evidence that a fall in real incomes of the kind experienced in the last two years has any effect beyond that captured through the debt service ratio. For the possessions and 12 month arrears rate no significant effect can be detected. However, there is evidence that a fall in the rate of growth of real per capita personal disposable income over the previous two years does push up the 6 month arrears rate. The effect is statistically significant though not quantitatively substantial.

2.2 Changes in the extended loan quality and forbearance policy functions

The most important remaining shifts in the model are changes in the 'forbearance policy' and 'loan quality' function. As noted above, the forbearance policy function captures shifts in policy which reduce possessions but increase arrears. Most dramatically, such a shift in policy occurred at the end of 1991, with effect from 1992Q1, and in 2008Q4. With additional data, it was possible to obtain a more robust test of the restrictions imposed earlier. We previously assumed that increased forbearance after the end of 1991 was reversed over two years in 1997 and 1998, following evidence of reduced public concern seen in the tighter Income Support for Mortgage Interest (ISMI) conditions imposed from 1995. This restriction remains accepted by the data. We then previously assumed no change in the forbearance function until the new mortgage crisis in 2008. Testing this hypothesis by introducing dummies in intervening years showed one strongly significant effect in 2005-6. The evidence suggests that possessions rose while arrears fell in this period in a way that cannot be explained in conventional economic terms. This apparently reduced forbearance is consistent with a higher proportion of loans accounted for by a tough new type of lender, more willing to take on riskier borrowers,

¹ One might query whether high levels of 'youth' unemployment induce a distortionary effect: with unemployment particularly high for the under-25s - a group which has very low home ownership rates, the number of repossessions within this group is likely to be minimal. There is merit in this point, but there is a possible countervailing bias suggesting that the effect of unemployment has not diminished. Much of the growth of employment since 2008 has been in part-time work, suggesting that labour market opportunities have contracted more in this period than indicated by the rise in the unemployment rate. This contraction has probably increased mortgage defaults.

but quicker to resort to the law when payment problems arose.² There is circumstantial evidence consistent with this view from the Financial Services Authority (FSA) in the Turner Report, discussing mortgage market conditions for the period 2005-2007. There was, for example, an increase in the share of 'Intermediate Mortgage Lenders' and in the share of securitised lending in this period. Northern Rock and other lenders were engaging in aggressive competition for market share, with low margins on mortgage rates and high loan to value ratios (LTV) on offer.

The 'loan quality' function, as previously discussed, captures hard to measure factors which shift arrears and possessions in the same direction. Most obviously, this would be more risky lending in the previous one to four or so years, which would drive up current rates of arrears and possessions. But the 'loan quality' function also captures two additional effects. The first of these is from another aspect of policy: the improved income support for those with mortgage payment difficulties serves to enhance apparent lending quality, and hence reduce both arrears and possessions below what they would have been. The second effect is through improved refinancing opportunities. These could arise as a matter of policy, for example if banks allow borrowers with payment difficulties to extend their loan terms (rescheduling the debt), or to wrap arrears up in a larger mortgage. This would reduce both possessions and recorded arrears. The Financial Stability Report (December 2011) of the Bank of England gives an estimate, discussed further below, of how much higher arrears might have been without this kind of help for borrowers.

Variations in refinancing opportunities can also arise in the course of market movements in mortgage credit availability. For example, it is likely that the worsening underlying quality of lending in the 2005-2007 period was initially offset or even more than offset by the ease with which borrowers under pressure were able to refinance, to temporarily escape from payment difficulties. As before, we find evidence consistent with this interpretation of a small reduction in both arrears and possessions in 2005-2007, before the credit crunch beginning in the second half of 2007 reduced these refinancing opportunities.

In the short-term, refinancing appears to improve loan quality - both arrears and possessions fall as a result of rescheduling or absorbing the arrears into a larger mortgage. But borrower risk remains and may be worsened through a larger debt obligation and over a longer period (unless this is countered by concomitant debt forgiveness/write-offs). Thus in the *long-term*, such

² The freely estimated size of this effect is a little larger than the corresponding shift in 1997-8. We can accept the hypothesis that the effect has the same magnitude as the 1997-8 shift and prefer to impose this restriction.

refinancing worsens loan quality, and both arrears and possessions might be expected to rise.

To examine the shapes of the 'loan quality' LQ function and of the 'forbearance policy shift' PS function from 2008Q4 with minimal restrictions, we introduce quarterly step dummies for every quarter from 2008Q4 to 2011Q3 and then test down to eliminate insignificant terms. This is considerably more general than in our previous paper, though the impact of the reformulation on the estimated effects of the economic drivers is minimal. The resulting functions are plotted in Figure 1.

2.2.1 Interpreting the estimated loan quality function

The first sign of deteriorating lending quality in the latter 1980s was apparent in a rise in the LQ function in 1986-7, exacerbated in 1989, and peaking in 1990Q4. It seems likely that easy credit in 1986-7 may have initially masked a decline in underlying loan quality, and that the peak in LQ from 1990Q4 may also be reflecting reduced access to credit. By 1994-6, the higher lending standards resulting from more cautious behaviour by lenders following the mortgage default crisis result in lower default rates and a decline in the LQ function. In 1997-8, the LQ function rises again, which we interpret as due to the tightening of rules on ISMI announced in 1995 (reduced state support). There is then a period of stability in the LQ function. Stability does not necessarily mean that the quality of lending, strictly conceived, was constant. It can also result if increased access to refinancing opportunities roughly balances a deterioration in underlying lending quality. The LQ function exhibits a small fall in 2005-6 suggesting that, at that time, easier refinancing opportunities more than offset a deterioration in underlying lending quality. A pronounced increase in defaults from 2007Q3, reflects both the earlier lax lending standards, the sharp reduction of refinancing opportunities and perhaps worsened longer-term risk through the spate of past refinancing. The LQ function then worsens sharply to a peak in 2009Q1, reflecting both the riskiness of many mortgage loans granted in previous years and the short-term evaporation of refinancing opportunities in the credit crunch.

However, from 2009Q2 it appears that the improved government income support and perhaps also refinancing by their banks for borrowers with payment difficulties had a dramatic effect on both arrears and possessions; LQ falls with a small further improvement in 2009Q3. From 2009Q4, however, the previous upward drift resumes in the LQ function, with rises in arrears and possessions, probably due to reduced credit availability for borrowers in general, or perhaps because borrowers with payment difficulties, who had been refinanced earlier, were running into new difficulties.

From 2010Q4 and for the next four quarters, no further shifts in the LQ function can be detected. The reassuring interpretation is that the improved lending standards associated with tighter credit conditions from the end of 2007 were beginning to show up in the aggregate data, roughly offsetting several default-increasing tendencies. The latter might include the effects of those borrowers on jobseeker's allowance approaching the end of the 2-year limit on Income Support for Mortgage Payments (ISMI or SMI, in its current terminology), of some of those previously refinanced running into repeated difficulties, and of the reduction (announced in June 2010) in the standard rate of interest used to calculate the SMI payments.

2.2.2 Interpreting the estimated forbearance policy shift function

A sharp change in policy in December 1991 is seen in the pronounced fall in the PS function in 1992Q1, reflecting greater forbearance. In 1997-8, the withdrawal of this forbearance and resumption of 'normal' practice is confirmed by the data. We tested this restriction and confirmed the cancellation of the early 1990s increase of forbearance. As discussed above, the main difference from our earlier specification is that the PS function now rises in 2005-6, which we interpret in terms of a shift in the composition of mortgage lending at this time; evidence suggests there was an increase in the proportion of lenders ("centralised mortgage lenders") extending riskier loans but quicker to resort to the courts when default problems arose. In 2008Q4, the PS function again fell sharply representing newly-reinforced forbearance, mainly through the Mortgage Pre-Action Protocol which came into force in November 2008, see Atkinson (2009) and Stephens (2009). Some of the shift in 2008 would have been temporary in nature since the revised mortgage code of practice delayed some possessions actions. Experimentation with lags in the 2008Q4 step dummy, suggests the PS function is then flat for a few quarters, presumably because the increased application of the protocol roughly balanced the partial reversal to be expected as previously delayed possessions proceedings were enacted. From 2009Q4, the PS function drifted up as more of the delayed possessions proceedings came through. After 2010Q4, however, there is a renewed fall in the PS function and increased forbearance, which we associate with new FSA rules on mortgage providers. Again, one should expect a partial reversal, since part of the effect of new rules is to delay default proceedings, and in 2011Q2, there is indeed such a partial reversal.

It is important to note that the 'forbearance policy shift' indicator in our model measures forbearance which reduces possessions by tolerating higher levels of arrears. It is identified by its negative effect on the possessions rate simultaneously with its positive effect on arrears rates. As previously mentioned, another kind of forbearance involves a longer lasting refinancing,

where, for example, existing arrears are rolled up in additional debt and/or the term for repayment is extended, so reducing monthly payments. However, this type of forbearance is similar to the refinancing of debt when mortgage credit is easily available, and when borrowers can raise cash to overcome current payment difficulties by taking on further debt. This reduces both possessions and arrears in the short run, but probably worsens both in the long run, and so is covered by our 'loan quality' indicator, see discussion above. The Financial Stability Report of the Bank of England in December 2011 suggests that the magnitude of this type of forbearance is substantial:

"The FSA forbearance review carried out for the FPC covered three quarters of UK mortgages. It suggests that 5–8 percent of mortgages are subject to forbearance, depending on the definition applied. FSA estimates indicate that around 5 percent of these households would have been in arrears of six or more months if they had not received forbearance. That suggests that, in the absence of forbearance, the mortgage arrears rate might have been 0.5 percentage points higher at 1.7 percent, even at near-zero official interest rates".

This review appears to refer to early 2011. If these estimates are correct, the arrears rate would be almost 30 percent lower (i.e. 0.5 percent divided by 1.7 percent) than it otherwise would have been.

It is possible to make an estimate of the impact on possessions of this type of forbearance. We use the above assumption of the 30 percent counterfactual fall in the arrears rate, and apply the coefficients on the LQ function in our model. In our model, the impact of the LQ function on the 6-month arrears rate is 1.47 of the size of its impact on the rate of possessions. This implies that the possessions rate would then have been almost 20 percent lower ($1/1.47$ multiplied by 30 percent) than it would have been otherwise. If this were counted as a benefit of policy, as opposed to something mortgage lenders would anyway have done, the total effects of policy intervention on possessions would necessarily be substantially in excess of 20 percent since the benefits of more generous SMI rules as well as of the Mortgage Pre-Action Protocol would have to be included to measure the total impact of policy shifts on possessions rates. However, it does seem plausible that some of the forbearance on refinancing estimated by the FSA would have been instituted by lenders even in the absence of government suasion.

It is not possible to make a strict calculation of the total impact of policy from our estimates. This is because, as emphasised above, our 'loan quality' indicator includes some of the effects of government policy in supporting borrowers in difficulties (e.g. the effects of improvements in SMI and

forbearance in the form of recapitalisation). Our 'forbearance policy' indicator is for a narrower definition of forbearance that excludes the consequences of refinancing and recapitalisation. Nevertheless, some insights are suggested into the impact of policy. We can obtain a clean estimate of policy from the PS function, but extracting the policy component from the LQ function is more difficult. Data on mortgage possessions rates by vintage of origination would be needed to separate strict loan quality from the above policy factors encapsulated in the LQ function.

Our model suggests that between 2008Q3 (i.e. before forbearance policy shifted, see Table 1) and 2011Q3, our 'forbearance policy shift' indicator fell by 11 percent. This implies a lowering of the possessions rate by around 11 percent (since the coefficient is normalised at 1 in the possessions equation). The corresponding rise in the 6-month arrears rate over the same period is 15 percent (the coefficient of the PS function in the arrears equations is about 1.42). Taking a different starting point, 2009Q1, as a benchmark (i.e. just before loan quality improved, see Table 1), our 'loan quality' function, implies a lowering of the possessions rate of 12 percent and of the 6-month arrears rate by 17 percent by 2011Q3 because it falls ('loan quality' improves) by 12 percent over this period.³

The fall of 12 percent in the LQ indicator between 2009Q1 and 2011Q3 probably understates the effects of policy action in the form of income support and refinancing since it is likely that without such action the LQ indicator would have continued to deteriorate in 2009. In other words, the fall of 12 percent in the LQ indicator between 2009Q1 and 2011Q3 reflects the net effect of a deterioration due, for example, to tighter credit conditions and risky lending in previous years, and an improvement due to policy interventions. This suggests that the total impact of policy on the possessions rate, including the 11 percent fall implied by our forbearance function, is likely to have exceeded 23 percent (11 percent plus *at least* 12 percent).

We can be fairly confident that a medium term reduction of 11 percent in possessions accompanied by a 15 percent rise in 6+month arrears is the best estimate of the medium term effect of the Mortgage Pre-Action Protocol (and possibly of associated greater forbearance exercised by partly state-owned banks). This 11 percent figure is after the temporary reductions in possessions and increases in arrears caused by the slow-down in court procedures associated with the protocol have passed. By contrast, the type of

³ Note that compared to the earlier benchmark of 2008Q3, however, our estimated 'loan quality' indicator implies a *rise* in possessions of 3 percent and of arrears by 4 percent by 2011Q3. This is because the implicit estimates of the effects of previously lax lending standards and of the tightening of credit conditions imply a further deterioration in defaults in 2008Q4 and 2009Q1

forbearance discussed by the FSA is of the kind which reduces arrears (and possessions) by refinancing mortgage debt (or conceivably by writing off part of debt). This latter type of forbearance is harder to disentangle from other causes such as income support for mortgage borrowers and possible changes in mortgage credit availability which affect refinancing voluntarily offered by mortgage lenders.

Given the substantial impact of policy interventions, it follows that withdrawal of such policy support would cause a serious deterioration in mortgage defaults unless offset by remarkably benign economic circumstances. Below we discuss forecasts in several hypothetical economic scenarios and also include some hypothetical changes in the LQ and PS indicators.

3. The forecast scenarios

Forecasts are given for 2012Q1 to 2015Q4 of total and voluntary mortgage possessions, arrears (≥ 6 months) and arrears (≥ 12 months), based on different economic scenarios⁴. These forecasts were generated using the model described in Aron and Muellbauer (2010a, 2010b), with changes as discussed above. The data and assumptions underlying the forecasts are explained in section 3.1, with reference to Appendix 3.

Six contrasting scenarios are described in section 3.2. The first five are broadly based around March 2012 forecasts by the OBR for underlying variables including interest rates, unemployment rates, inflation, house prices, disposable income, and the mortgage stock. A sixth base scenario, for contrast, uses forecasts from *Oxford Economics*. The varying scenarios illustrate possible risk factors in the outlook for arrears and possessions.

3.1 Forecast data

Assumptions are given for the variables taken as exogenous: unemployment rates, mortgage debt, interest rates (and hence debt service ratios), house prices (and hence debt to equity ratios), and per capita real income and prices. The data underlying the exogenous variables are taken from two

⁴ The charts and quarterly forecast tables are based on CML data up to 2011Q3 published in November 2011. On 9 February, 2012 the CML published estimates for 2011Q4 and revised figures for the earlier quarters of 2011. The latter revised up earlier estimates for 2011 by of the order of half a percent which may suggest that 2011Q4 estimates may also be revised up in due course. As it happens, our forecasts for 2011Q4 are of the order of 1-2 percent above the 2011Q4 estimates for possessions and both types of arrears. In the annual tables at the end of the paper we use the CML's revised annual estimates for 2011, published on 9 February, 2012. These are therefore not exactly consistent with the quarterly figures for 2011 shown earlier in the appendix.

sources: the OBR and *Oxford Economics*. For the former, the published data⁵ are given in the first table in Appendix 3. Households' final consumption expenditure data are used to construct the private consumption deflator. The private consumption deflator is then used to deflate households' disposable income, and real disposable income is used in the model. The working age population forecasts of *Oxford Economics* are used in preference to OBR forecasts of the Labour Force Survey (LFS) household population, all aged 16 and over (ONS identifier: MGSL). The OBR's projections of LIBOR are adjusted with our own forecasts of the premium between the mortgage rate and LIBOR (see Appendix 3). The final rate is divided by 100. House prices are derived from the annual rates of growth forecast by the OBR, by assuming quarterly rates are 25 percent of corresponding annual rates. The growth rate of household financial liabilities is used to forecast the mortgage stock. Growth rates are constructed for population, house prices, real income, household financial liabilities and the private consumption deflator. The forecast exogenous variables are graphed in Appendix 4.

3.2 Assumptions underlying the six scenarios

Scenario 1 and *Scenario 6* are the **base** scenarios using OBR and *Oxford Economics* assumptions, respectively. In *Scenario 1*, the interest rate premium over the OBR's Libor forecast, however, is based on our own assumptions (the premium is assumed to rise slightly in 2012 and then remain constant; it is shown in Appendix 3). *Scenario 2* and *Scenario 3* are the **high economic growth or positive economic** (HG) and **low economic growth or negative economic** (LG) scenarios, respectively, constructed by adding increments to the OBR base scenario. These quarterly rates increments (for the mortgage interest rate and unemployment rate) and growth rates increments (for income, house prices and the mortgage lending stock), are our own, and are shown in the second table in Appendix 3. Further assumptions are that the population growth rate and the growth rate of the personal consumption deflator are the same in the base, low growth and high growth scenarios. The number of mortgages is assumed to rise at the rate of 0.1 percent per quarter in all scenarios considered in this paper.

In the base scenarios and high growth and low growth scenarios, it is assumed that there is no change in the 'loan quality' and 'forbearance policy shift' indicators in the period to 2015Q4. In *Scenario 4* and *Scenario 5* we examine **sensitivity assumptions** in the forbearance policy shift function (PS) and the loan quality function (LQ), around the OBR base scenario, *Scenario 1*.

⁵ The website is: <http://budgetresponsibility.independent.gov.uk/category/publications/>.

First, consider a negative scenario, *Scenario 4*. Here we assume that the forbearance policy shift indicator rises by 0.05 (approximately 5 percent) in 2012Q2, indicating less forbearance. As noted above (in section 2.2.2), we estimated an 11 percent fall in this indicator from 2008Q3 to 2011Q3, implying an 11 percent fall in the possessions rate. The 5 percent rise, therefore, would cancel almost half of this shift.

The second assumption in this negative *Scenario 4* is of a 10 percent rise in the 'loan quality' indicator, i.e. a deterioration of loan quality, implying eventually a 10 percent rise in the possessions rate.⁶ We assume that half of this rise occurs in 2012Q2 and half in 2012Q3. One possible reason for such a deterioration could be a reduction in the generosity of SMI benefits. Another could be the result of further credit tightening. For example, as reported in the Financial Times (Jan 23, 2011), current EU draft rules for bank regulation treat a mortgage as being 'in default' for purposes of provisioning and capital adequacy if payment arrears are over 3 months, while UK practice is to take 6 months arrears as the relevant threshold. A switch to EU practice would require UK banks to set aside more funds which would reduce the amount available for lending and hence reduce refinancing possibilities for borrowers under financial pressure. This would be likely to raise possessions and the 6-month arrears rate. A third possibility is that the reforms recommended by the Vickers Banking Commission, see Independent Commission on Banking (2011), which will require banks to raise more capital, in part because of the internal separation of retail from investment banking activities, could have similar consequences, though perhaps it is less plausible that they would be felt as soon as 2012.

As a positive alternative scenario, *Scenario 5*, we suppose there is no shift in the 'forbearance policy shift' indicator but that the 'loan quality' indicator falls (improves) gradually to reflect the improved underlying quality of lending in the years since 2007, when lenders became more cautious. If this effect operated, we would expect it to lead to a gradual improvement as the proportion of outstanding loans made in the more cautious post 2007 lending environment slowly began to rise. To reflect the gradual nature of this effect, we phase in a 10 percent fall (improvement) in this indicator beginning in 2012Q2 and completed by 2014Q. In other words, one eighth of the fall in the indicator occurs in 2012Q2, one quarter by 2012Q3 and so on until the full effect is reached in 2014Q1.

⁶ Both the PS and LQ coefficients are normalised at 1 in the possessions equation.

4. Forecast results

Graphical forecasts of the logs of possessions, voluntary possessions, arrears (≥ 6 months) and arrears (≥ 12 months), for each of six scenarios, for 2011Q4 to 2015Q4, are shown in Appendix 4. The underlying assumptions are traced out from 2000Q1 to 2015Q4 in the graphs beneath these figures. The forecasts of the numbers of properties taken into possession in the period, and of the numbers of household with loans in arrears (≥ 12 months and ≥ 6 months) are given in Appendix 5. Appendix 6 shows the corresponding forecasts for the estimated proportion of mortgages in negative equity, given assumptions on the ratio of average debt to average equity and forecasts of possessions. Appendix 7 provides annual summaries of the data from Appendix 5.

In *Scenario 1*, the base case using OBR projections for the economic variables, it is assumed there is no change in the 'loan quality' and 'forbearance policy shift' indicators in the period to 2015Q4. Key features of the base scenario are unemployment peaking at 8.7 percent in 2012Q3-2013Q1 then declining gently to 6.8 percent by the end of 2015. Mortgage interest rates rise by 0.1 percentage point in 2012 to 3.75 percent but decline again in 2013 to 3.55 percent, given the OBR's forecast of a 0.2 percentage point decline in Libor; they then rise continuously from 3.55 percent in 2014Q1 to 4.45 percent in 2015Q4. House prices fall slightly until 2012Q4 then rise slowly to the end of the sample by a total of 7 percent in nominal terms. Real per capita income growth is slightly negative in 2012, rising to 0.5 percent in 2013, and 2.3 percent in 2014, and finally, to 2.7 percent in 2015. The mortgage stock grows quite strongly at 2.5, 4.1, 5.3 and 6.3 percent per annum from 2012 to 2015, respectively.

As noted in the introduction, possessions in 2012 in our base scenario, *Scenario 1*, are forecast to be little changed from 2011, while the 6-month arrears rate is forecast to be a little higher at the end of 2012 than at the end of 2011, mainly due to higher unemployment. The combination of higher unemployment and of a small upward drift in the estimated proportion in negative equity is mainly felt in 2013: the end-of-2012 6-month arrears level is 3.5 percent higher than in 2011; and the end-of-2013 6-month arrears level is 8.7 percent higher than in 2011. Annual possessions are 10.6 percent higher in 2013 than in 2011, and possessions numbers increase further in 2014 and 2015. Possessions are 38 percent higher in 2015 than in 2011, as interest rates, assumed to start rising from 2013Q3, are not sufficiently offset by falling unemployment and a slightly faster rise in disposable income and in house prices. In *Scenario 1*, the 6-month arrears figures stabilise in 2014 but then rise again in 2015 for similar reasons.

In *Scenario 2*, the positive variant of the base scenario (i.e. the high growth scenario) in which interest rates are held down for longer, unemployment falls sooner and growth in incomes and house prices is a little higher, there is a substantial and almost continuous decline in all three default indicators to 2015Q4. The annual number of possessions declines from 36,200 in 2011 to 34,100 in 2013, and to 26,400 in 2015. The number of mortgages with arrears of 6 months or more falls from 125,500 at the end of 2011 to 120,000 at the end of 2013, and to 89,300 at the end of 2015.

In contrast, *Scenario 3* (i.e. the low growth scenario) is far more pessimistic: interest rates rise sooner, unemployment rises for longer, and growth in income and in house prices is more subdued. Indeed, nominal house prices are assumed to decline by 6 percent between 2011Q4 and 2015Q1, before beginning to rise. Here the number of annual possessions rises from 36,200 in 2011 to 67,500 in 2013, and to 148,300 in 2015. It is remarkable, however, that even under this negative scenario the total number of possessions cases in 2012 is forecast to rise only to 40,200, in contrast to the Council of Mortgage Lenders (CML)'s Dec. 2011 forecast of 45,000 for 2012. The number of 6-month arrears cases under this (admittedly very implausible) scenario rises from 125,500 in 2011Q4 to 202,000 in 2013Q4, and to 288,000 in 2015Q4. For the Monetary Policy Committee (MPC) to raise the base rate under such negative economic circumstances would need an extreme loss of confidence in the UK and in Sterling relative to other currencies. This is hard to envisage in a world where the Eurozone remains fragile.

Next, we consider some variations in the underlying 'forbearance policy shift' and 'loan quality' indicators, but otherwise assume the base scenario for the economic variables. In a negative scenario, *Scenario 4*, we assume that the forbearance policy shift indicator rises (deteriorates) by 0.05 (approximately 5 percent) in 2012Q2. This rise would wipe out almost half the prior 11 percent fall in this indicator measured from 2008Q3 to 2011Q3 (implying a 6 percent net fall in the possessions rate between 2008Q3 and 2011Q3). The second assumption in this negative scenario is of a 10 percent rise (worsening) in the 'loan quality' indicator (e.g. because of reduced access to refinancing), implying eventually a 10 percent rise in the possessions rate. We assume that half of this rise in the indicator occurs in 2012Q2 and half in 2012Q3. Under *Scenario 4*, possessions would rise in the long run by 15 percent more than under the base scenario, i.e. to around 58,700 in 2015 compared to 50,100 under the base, while the 6-month arrears would rise by around 6 percent compared to the base in which the 'loan quality' and 'forbearance policy shift' indicators are unchanged up to 2015Q4, i.e. to 149,200 at the end of 2015 compared to 141,100 under the base, see Appendix 7. For 2012, our forecasts of the number of possessions cases is still short of the CML forecast of 45,000 even when the negative economic scenario in *Scenario 3* is

combined with the negative 'policy' and 'quality' assumptions of *Scenario 4*, to give a possessions total for 2012 of only around 43,200.

In the positive alternative scenario, *Scenario 5*, we assume no shift in the 'forbearance policy shift' indicator but that the 'loan quality' indicator falls gradually to reflect the improved underlying quality of lending in the years since 2007. A 10 percent fall in this indicator is phased in from 2012Q2 and completed in 2014Q1 to reflect the slow transition. Unsurprisingly, *Scenario 5* results in a 10 percent fall in possessions by 2015, i.e. to 45,200 compared to 50,100 under the base, and a 15 percent fall in 6-month arrears, i.e. to 120,600 compared to 141,100 under the base scenario of no change in the 'loan quality' indicator.

Finally, we consider *Scenario 6* in which we take base forecasts for the economy provided by *Oxford Economics*. Under their forecasts, there is no further fall in the mortgage rate in the near future and the mortgage rate rises a little sooner than under the OBR assumptions on Libor, reaching 4.8 percent by the end of 2015. Unemployment starts to fall earlier than in *Scenario 1* from a peak of 8.6 percent in 2012Q4 to 6.5 percent in 2015Q4, slightly below the OBR's figure of 6.8 percent. The forecast growth rate of house prices is somewhat below the OBR forecasts, with house prices drifting down till 2013Q4. Real per capita income growth is zero in 2012, but rises more strongly than in *Scenario 1*, to 2.4 percent in 2013, and 2.6 percent in 2014, and finally, to 2.7 percent in 2015. The mortgage stock grows at a lower rate than in *Scenario 1*, at 0.7, 2.9, 3.6 and 3.4 percent per annum from 2012 to 2015, respectively. These rates are of the order of one half of the rates assumed by the OBR. This has the result that despite somewhat weaker house price growth than assumed by the OBR, the ratio of the average mortgage to the average house price rises by less than implied by the OBR assumptions. Hence negative equity rises less than for the OBR base case. Also, despite slightly higher interest rate assumptions from the end of 2013, the debt-service ratio rises a little less than implied by the OBR forecasts. With these two key determinants more benign than implied by the OBR forecasts, possessions and 6-month arrears rise less strongly than under the OBR base scenario. The total for possessions in 2014 is only 38,200 (43,400 in 2015) in *Scenario 6* compared to 44,100 (50,100 in 2015) forecast in *Scenario 1*. The numbers of mortgages with arrears of 6 months or more remain below the end-of-2011 total throughout this forecast horizon, while under *Scenario 1* they rise from 125,500 at end-2011 to 141,100 at the end of 2015.

These are interesting contrasts. If one assumes that households are less enthusiastic about expanding borrowing or keener to repay debt than

assumed by the OBR, the outcomes for mortgage defaults are significantly more benign.

Turning to voluntary possessions, the estimated model is necessarily less reliable but suggests that voluntary possessions are even more sensitive in the long run than total possessions to negative equity, the debt service ratio and lending quality (especially the last two). This implies that voluntary possessions rise relative to total possessions in the negative *Scenario 3* and *Scenario 4*, and rise less in *Scenario 6* than in *Scenario 1*.

5. Conclusions

We have re-estimated our system of equations for rates of 6 and 12 month mortgage arrears and possessions on data up to the third quarter of 2011, and forecast to the end of 2015. The structure and the parameter estimates of our system of equations remain much as before, though the impact of unemployment on the possessions rate is now higher and more precisely estimated for the revised and updated data. As discussed above, the opportunity was taken to refine the estimates of the ‘loan quality’ and ‘forbearance policy’ indicators, particularly since the end of 2008. It is not possible to identify completely the impact of the mix of policies applied to reducing mortgage defaults given that the previously lax lending standards and the tightening of credit have also affected outcomes. Nevertheless, it is likely that the combined impact of policy reduced the possessions rate by *at least* 23 percent by 2011Q3 compared to what it otherwise would have been (details in section 2.2). As before, the different scenarios and the decomposition of possessions and arrears rates into the main economic drivers, highlight the importance of the debt service ratio and of negative equity for default outcomes, with the unemployment rate playing a significant but less quantitatively important role than the other two drivers.

As far as the short-term outlook for possessions is concerned, not even the most negative scenarios which were considered were able to match the substantial rise in numbers of possessions from 36,200 in 2011 to 45,000 in 2012 forecast by the CML in December 2012. In Feb 2012, the CML confirmed that it was maintaining this forecast, giving the following explanation:

“Our assumptions are derived primarily on our assessment of underlying conditions in the economy. But these underlying drivers do not always result in exactly what one might expect. So, over the last few years, the current very low interest rate environment does seem to have acted as an even more significant brake on repossessions than consideration of the economic situation as a whole might have anticipated. However, the CML’s current assessment is that a greater number of stretched households are likely to find

it more difficult to cope this year, despite continuing forbearance policies by lenders, as upward pressure on arrears and repossessions will be exacerbated by the weakening employment market. Hence we predict an uptick in repossessions over the course of 2012.”

Our research suggests two possible challenges to this assertion: first, the direct effect of the unemployment rate on the rate of possessions is quite moderate, relative to the effects of the debt service ratio and of negative equity; secondly, as there is a lag of at least 4 quarters between the unemployment rate and possessions it would take longer for the effects of further deteriorations in the unemployment rate to feed through. Of course, there can also be indirect effects of higher unemployment in lowering house prices, but the CML appears not to be warning of substantial falls in house prices in 2012. Whilst it is still conceivable that the CML forecast for 2012 could prove right, this would in our view need a substantial early rise in mortgage rates combined with a substantial early fall in house prices. Most observers of the markets currently consider this quite unlikely.

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Table 1: Priors on lending standards and policy shifts for past changes

<i>Date</i>	<i>Shift</i>	<i>Arrears Impact</i>	<i>Possessions Impact</i>
1986-1989, peak in 1990q4	Poor quality lending, reduced credit access at end.	Arrears up	Possessions up
End 1991	Policy shift (increased forbearance) to reduce possessions	Arrears up	Possessions down
1994/5-6	Better lending quality	Arrears down	Possessions up
1997-8	Policy reversal (back to normal) and SMI rules tightened affecting lending quality	Arrears ?	Possessions up
1999-2005	Good lending quality and/or easy credit access	Arrears down	Possessions down
2005-6	Change in the composition of the mortgage market toward riskier lenders; easy refinance overwhelms poor quality lending	Arrears fell	Possessions up
2007-2009	Poor quality lending; reduced access to credit	Arrears up	Possessions up
2008q4	Policy shift (Mortgage Pre-action Plan increases forbearance) to reduce possessions	Arrears up	Possessions down
2008-9	Income support (ISMI/SMI) made more generous; refinancing of mortgages	Arrears down	Possessions down
2010q4	New FSA rules promote increased forbearance	Arrears up	Possessions down
2011q4	Vickers Report accepted		

Notes: Financial Services Authority (FSA); Income Support for Mortgage Interest (ISMI)/ Support for Mortgage Interest (SMI).

Table 2: Definitions of variables used in the regressions

Symbol	Definition	Means	Source
$\log poss_t$	Log of the ratio of possessions to number of mortgages outstanding	-7.34	CML
$\log vposs_t$	Log of the ratio of voluntary possessions to number of mortgages outstanding	-9.09	CML
$\log arr6_t$	Log of the ratio of arrears (greater than or equal to 6 months) to number of mortgages outstanding	-4.67	CML
$\log arr12_t$	Log of the ratio of arrears (greater than or equal to 12 months) to number of mortgages outstanding	-5.89	CML
$\log ur_t$	Log of unemployment rate (Labour Force Survey measure)	1.998	ONS: Code MGSX
$\log dsr_t$	Log of cost of loan to income, measured as: $((arbm / 100)(avmort(-1)) / (avpdi))$ arbm=average mortgage interest rate, rbm ¹ , adjusted for tax before 2000; avmort=amwt/mortno; amwt=mortgage lending, stock, personal sector (£mn), from Financial Statistics; mortno=mortgages outstanding from CML; avpdi= annualised quarterly personal disposable income ² , current prices (£mn)/popw; popw=population of working age, 15 to 59 for women, 15 to 64 for men ('000s), quarterly interpolation.	-7.18	mortno: CML popw: ONS amwt: ONS rbm: ONS pdi: ONS
$\log negeq_t$	Log of the debt equity ratio, measured to proxy average mortgage to house prices. Implied proportion of negative equity (<i>normalised</i>) (see Aron and Muellbauer (2010a), equation (4), section 2.1): $negeq = ([1 / (1 + \exp(-\lambda * (\log(avdebt / equity) - \lambda_0)))])$ Then adjust <i>negeq</i> by subtracting the cumulated number of possessions cases over the previous 2 years, scaled by no. of mortgages outstanding. (average debt)/(average equity)=avmort(-1)/(ph); ph converted from quarterly index to an average quarterly house price. ph=2nd-hand mix-adjusted house prices ³ (2002Q1=100), <i>normalized</i> . $\lambda=7$, $\lambda_0 = -0.001*(t - 40) + 0.04$.	-3.13	ph: DCLG
$\log ry_t$	log real income/working age pop	1.56	
$sd2008q4_t$	Example of step dummy: step dummy =1 from 2008Q4, and 0 otherwise.	-	Constructed
$sdkmmx_t$	Double moving average of step dummies, with a smooth increasing transition from zero to one over 8 quarters, from zero in the last quarter of year xx-1, to one in the last quarter of year xx+1.	-	Constructed
$d84q3_t$	Impulse dummy for 1984Q3 for an outlier in 12month+arrears.	-	Constructed
$d89q3_t$	Impulse dummy for 1989Q3 for an outlier in possessions.	-	Constructed
$d04q1_t$	Impulse dummy for 2004Q1 for an outlier in possessions.	-	Constructed

Notes: The sample is the longest available for both arrears and repossessions, 1983Q2 to 2011Q3. Interpolated quarterly CML data are used before 1999, see Aron and Muellbauer (2010c).

1. Mortgage rate: from FSA MLAR, Table 1.22 - Residential loans to individuals: Interest rate analysis. Overall weighted average interest rate on balances outstanding, all loans. From 2000 to 2006, linked to average of mortgage rate on balances outstanding for banks and building societies, previously reported in Financial Statistics. Before 2000, linked to average mortgage rate on balances outstanding for building societies, previously reported in Financial Statistics, code AJNL.

2. Nominal household disposable income = real household disposable income x consumer expenditure deflator, where the latter = current price measure of consumer expenditure/chained volume index of consumer expenditure from Consumer Trends, both seasonally adjusted. Real household disposable income SA from UK Economic accounts, code NRJR.

3. Mix-adjusted index for UK for old dwellings from DCLG website Table 594.

**Table 3: Estimation results for arrears and possessions equations,
1983Q2-2011Q3**

<i>Variable</i>	<i>Para- meter</i>	<i>Possessio ns equation: Δlog poss</i>	<i>Robust std. errors</i>	<i>Para- meter</i>	<i>Arrears equation: Δlog ass12</i>	<i>Robu st std. errors</i>	<i>Para- meter</i>	<i>Arrears equation: Δlog arr6</i>	<i>Robust std. errors</i>
Constant	a0	5.70*	0.87	b0	2.69**	1.05	c0	3.94**	0.84
log dsrma(-1)	a1	1.67**	0.10	b1	1.47**	0.12	c1	1.43**	0.091
log negeqma(-1)	a2	0.683**	0.041	-		-			
log negeqma(-2)	-			b2	0.652**	0.045	c2	0.451**	0.029
log ur(-4)	a3	0.400	0.134	-			-		
log ur(-5)	-			b3	0.528*	0.224	c3	0.621**	0.154
Speed adjustment of	a4	0.407**	0.043	b4	0.551**	0.041	c4	0.458**	0.041
LQ (loan quality)	a5	1	-	b5	2.17**	0.28	c5	1.47**	0.209
PS (forbearance policy shift)	a6	-1	-	b6	0.525	0.378	c6	1.42**	0.400
Correction factor	-	-	-	θ12	-0.380**	0.055	θ6	-0.214**	0.037
Δlog negeq	a7	0.169**	0.052	b7	0.094*	0.028	c7	0.046**	0.0200
Δlog negeq (-1)	a8	0.182**	0.050	b8	0.107**	0.034	c8	0.0629**	0.0215
Δ ₈ log negeq (-1)	a14	-0.034**	0.010	-			-		
Δ ₄ log ur	-			b9	0.234**	0.094	-		
Δ ₄ log ur(-1)	-			-			c9	0.279**	0.063
Δlog poss(-2)	a10	0.359**	0.062	-			-		
dynamic shift adjustment				b10	0.227**	0.102	c10	0.493**	0.078
Δ ₈ log ry (-1)	-			-			c12	-0.24*	0.095
d89q3	a11	-0.195**	0.025	-			-		
d04q1	a12	-0.174**	0.024	-			-		
q1	a13	0.069**	0.016	-			-		
d84q3	-			-			c11	0.106**	0.010
Diagnostics									
Eq. standard error		0.062			0.0405			0.0242	
R squared		0.990			0.998			0.999	
LM Het test P-val		0.050			0.114			0.636	
Durbin-Watson		1.55			1.60			2.18	

Notes:

1. Estimates are reported to three significant figures. See the equations that generated these results below; variables are defined in Table 2.
2. ** indicates significant at the 1% level; * indicates significant at the 5% level.
3. The forbearance policy shift function enters as $(\kappa \cdot PS + (1 - \kappa) \cdot PS(-1))$, with κ fixed at 0.5.
4. The dynamic shift adjustment is for the 12-month and 6-month arrears, respectively,

$$(1 - sd1999_t) * (\Delta \log arr12_{t-1} - \theta_{12} \Delta \log dsr_{t-1}) \text{ and}$$

$$(1 - sd1999_t) * (\Delta \log arr6_{t-1} - \theta_6 \Delta \log dsr_{t-1})$$

where $sd1999$ is a step dummy beginning in 1999 when data frequency shifted to quarterly.

5. The selected possessions equation:

$$\begin{aligned} \Delta \log poss_t = & a_4 \times (a_0 + LQ_t + PS_t + a_1 \log dsrma_{t-1} + a_2 \log negeqma_{t-1} \\ & + a_3 \log ur_{t-4} - \log poss_{t-1}) + (PS_t - PS_{t-1}) + a_7 \Delta \log negeq_t + \\ & a_8 \Delta \log negeq_{t-1} + a_9 \Delta \log poss_{t-2} + \\ & a_{14} \Delta_8 \log negeq_{t-1} \\ & + a_{11} q1_t + a_{12} d89q3_t + a_{13} d04q1_t \end{aligned}$$

6. **The selected arrears equations:** the two arrears equations have a similar structure; the three main drivers are the log debt service ratio, the log imputed proportion in negative equity and the log unemployment rate.

Arrears > 12 months:

$$\begin{aligned} \Delta \log arr12_t = & b_4 \times (b_0 + b_1 \log dsrma_{t-1} + b_2 \log negeqma_{t-1} + b_3 \log ur_{t-5} \\ & + b_5 LQ_t - b_6 (\kappa PS_t + (1 - \kappa) PS_{t-1}) - (\log arr12_{t-1} - \theta_{12} \log dsr_{t-1})) \\ & + \theta_{12} \Delta \log dsr_t - 0.8 poss_t / arr12_{t-1} \\ & + b_7 \Delta \log negeq_t + b_8 \Delta \log negeq_{t-1} \\ & + b_9 (1 - sd1999_t) (\Delta \log arr12_{t-1} - \theta_{12} \log \Delta dsr_{t-1}) + b_{10} \Delta_4 \log ur_{t-1} \end{aligned}$$

Arrears > 6 months:

$$\begin{aligned} \Delta \log arr6_t = & c_4 \times (c_0 + c_1 \log dsrma_{t-1} + c_2 \log negeqma_{t-1} + c_3 \log ur_{t-5} \\ & + c_5 LQ_t - c_6 (\kappa PS_t + (1 - \kappa) PS_{t-1}) - (\log arr6_{t-1} - \theta_6 \log dsr_{t-1})) \\ & + \theta_6 \Delta \log dsr_t - poss_t / arr6_{t-1} \\ & + c_7 \Delta \log negeq_t + c_8 \Delta \log negeq_{t-1} \\ & + c_9 (1 - sd1999_t) (\Delta \log arr6_{t-1} - \theta_6 \log \Delta dsr_{t-1}) \\ & + c_{10} \Delta_4 \log ur_t + c_{12} \Delta_8 \log ry_{t-1} + c_{11} d84q3_t \end{aligned}$$

Table 4: Estimation results for forbearance policy shift and lending quality equations, 1983Q2-2011Q3

<i>Variable</i>	<i>Parameter</i>	<i>Estimate</i>	<i>Robust std. errors</i>
<i>Forbearance policy shift function</i>			
(<i>sd1991(-4) - sdmm97-sdmm05</i>)	P91	-.170**	0.0334
<i>sd2008q4</i>	P08q4	-.238**	0.0422
<i>sd2009q4</i>	P09q4	.058*	0.0231
<i>sd2010q2</i>	P10q2	.062**	0.0170
<i>sd2010q3</i>	P10q3	.041*	0.0170
<i>sd2010q4</i>	P10q4	-.080**	0.0203
<i>sd2011q2</i>	P11q2	.052**	0.0165
<i>Loan quality function</i>			
<i>sdmm86</i>	L86	.065*	0.0313
<i>sdmm89</i>	L89	.453**	0.0677
<i>sdmm94</i>	L94	-.148**	0.0327
<i>sdmm95</i>	L95	-.147**	0.0359
<i>sdmm97</i>	L97	.094**	0.0331
<i>sdmm05</i>	L05	-0.046	0.0269
<i>sdmm07(-2)</i>	L07a	.284**	0.0575
<i>sd2009q1</i>	L09q1	.090**	0.0303
<i>sd2009q2</i>	L09q2	-.226**	0.0444
<i>sd2009q3</i>	L09q3	-.033**	0.0129
<i>sd2009q4</i>	L09q4	.051**	0.0185
<i>sd2010q2</i>	L10q2	.035*	0.0150
<i>sd2010q3</i>	L10q3	.031*	0.0128

Notes:

1. Estimates are reported to three significant figures. See the equations that generated these results below; variables are defined in Table 2.
2. ** indicates significant at the 1 percent level; * indicates significant at the 5 percent level.
3. ***The selected forbearance policy shift equation:***

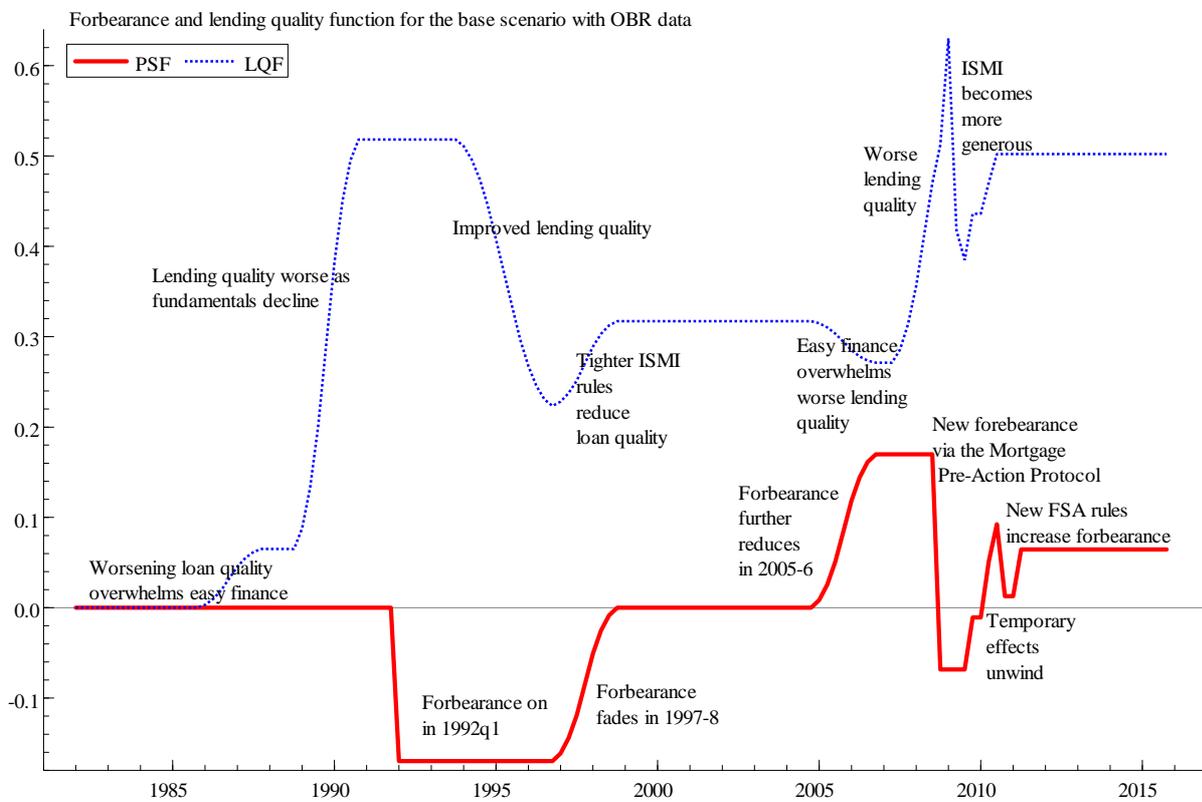
$$PS_t = p91 \times (sd1991_{t-4} - sdmm97_t - sdmm05_t) + p08q4 \times sd2008q4_t + p09q4 \times sd2009q4_t + p10q2 \times sd2010q2_t + p10q3 \times sd2010q3_t + p10q4 \times sd2010q4_t + p11q2 \times sd2011q2_t$$

where *sd1991* is a step dummy beginning in 1991.

4. The selected 'loan quality' equation:

$$\begin{aligned}
 LQ_t = & 186 \times sdmm86_t + 189 \times sdmm89_t + 194 \times sdmm94_t \\
 & + 195 \times sdmm95 + 197 \times sdmm97_t + 105 \times sdmm05_t \\
 & + 106 \times sdmm06_t + 107a \times sdmm07_{t-2} + 109q1 \times sd2009q1_t \\
 & + 109q2 \times sd2009q2_t + 109q3 \times sd2009q3_t + 109q4 \times sd2009q4_t \\
 & + 110q2 \times sd2010q2_t + 110q3 \times sd2010q3_t
 \end{aligned}$$

Figure 1: Forbearance and lending quality function for the base scenario with OBR data



KEY: Order of coloured lines: highest to lowest: LQF (lending quality function) and PSF (forebearance policy shift function). Financial Services Authority (FSA); Income Support for Mortgage Interest (ISMI).

Appendix 1: Data Revisions

This Appendix briefly explains the main data revisions which have entailed some shifts in the parameter estimates of the previous specification, even over the same period of estimation as before. One substantial set of data revisions concerns ONS revisions back to 1997 on the consumer expenditure deflator and hence on real personal household income, see <http://www.ons.gov.uk/ons/rel/consumer-trends/blue-book-2011--improvements-to-household-expenditure-estimates/q2-2011/index.html>. Inflation tends to be revised downwards and real income revised up.

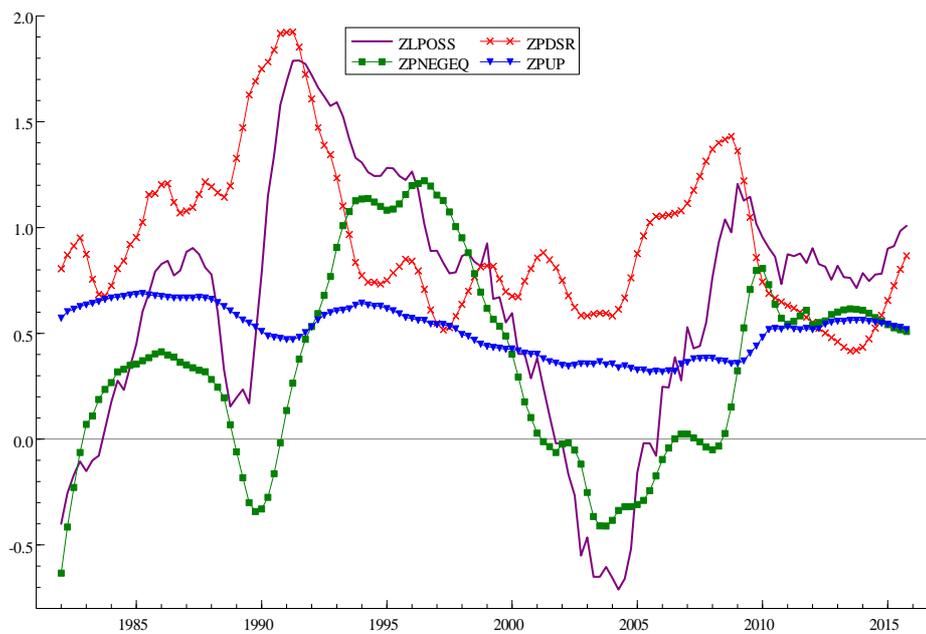
The ONS have revised the data on the stock of secured lending, code NNPR, i.e. the mortgage stock. However, a significant revision from substantial growth in 2005Q3 to almost no growth over that quarter concerned us, as it also was not confirmed by Bank of England data on secured loans. We therefore retained previous data to 2005Q4 and then spliced on the revised data.

The third set of revisions concerns CML data. From 2009Q1 CML figures are grossed up to be representative of the entire first charge market mortgage market. Earlier data relate to CML members only and so are not directly comparable with later figures. There is also a discontinuity in the number of mortgages outstanding, because CML excluded around 500,000 "legacy" loans from 2009Q1 to bring reporting by firms in line with their guidelines. The numbers of arrears and possessions cases were apparently not materially affected by the exclusion of legacy loans; CML⁷ also suggests that the numbers of arrears and possessions cases were little affected by grossing up, since only two very small mutuals issuing first charge loans were not CML members before 2009Q1. We thus adjusted upwards the number of mortgages outstanding from 2009Q1 reported by CML by 160,000 to reflect plausible rates of decline in the underlying number of mortgages over this period.

⁷ Communication with James Tatch, CML.

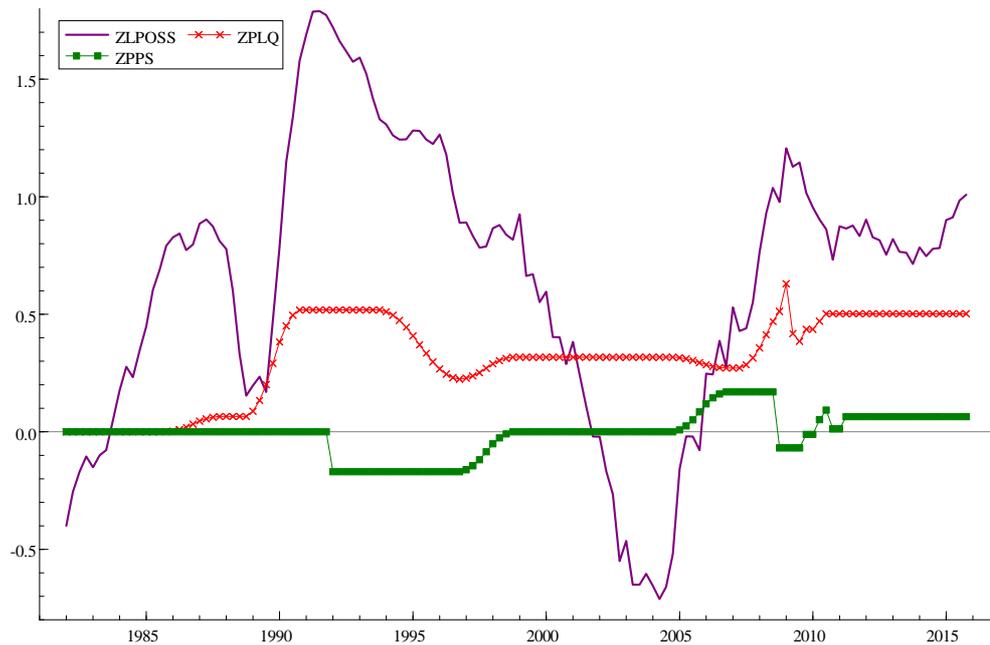
Appendix 2: Estimated long-run contributions of key explanatory variables to log arrears and log possessions

Figure 1: Estimated long-run contributions of key explanatory variables to the log possessions rate



Note 1: Variables are level-adjusted for visual purposes. Scenario 1 is assumed for 2011q4 to 2015q4.

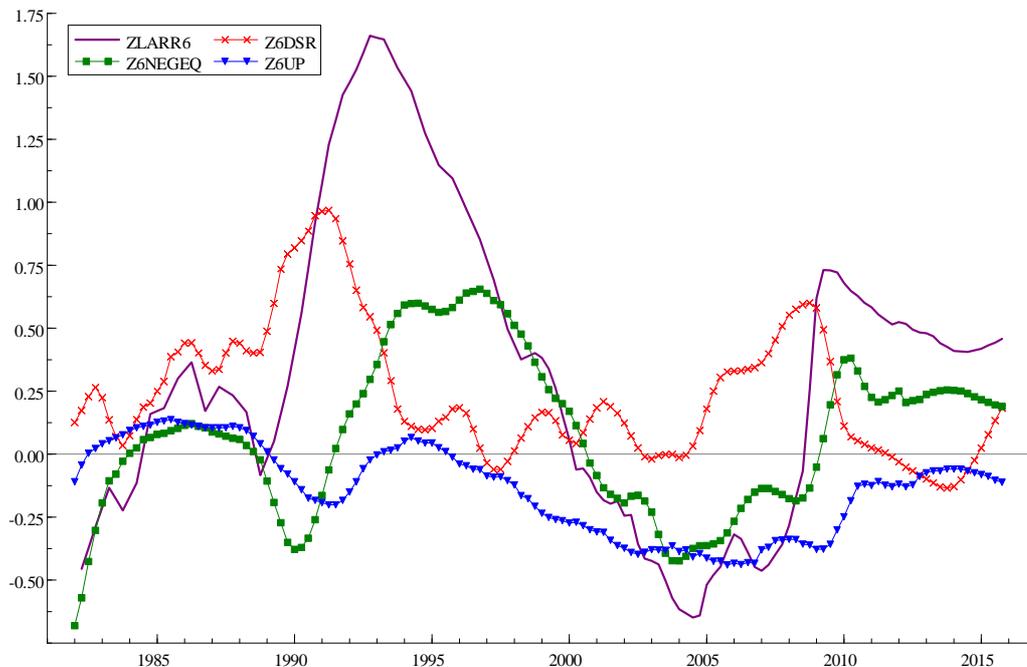
Figure 2: Estimated long-run contribution of lending standards and policy shift proxies to the log possessions rate



Note 1: Variables are level-adjusted for visual purposes. Scenario 1 is assumed for 2011q4 to 2015q4.

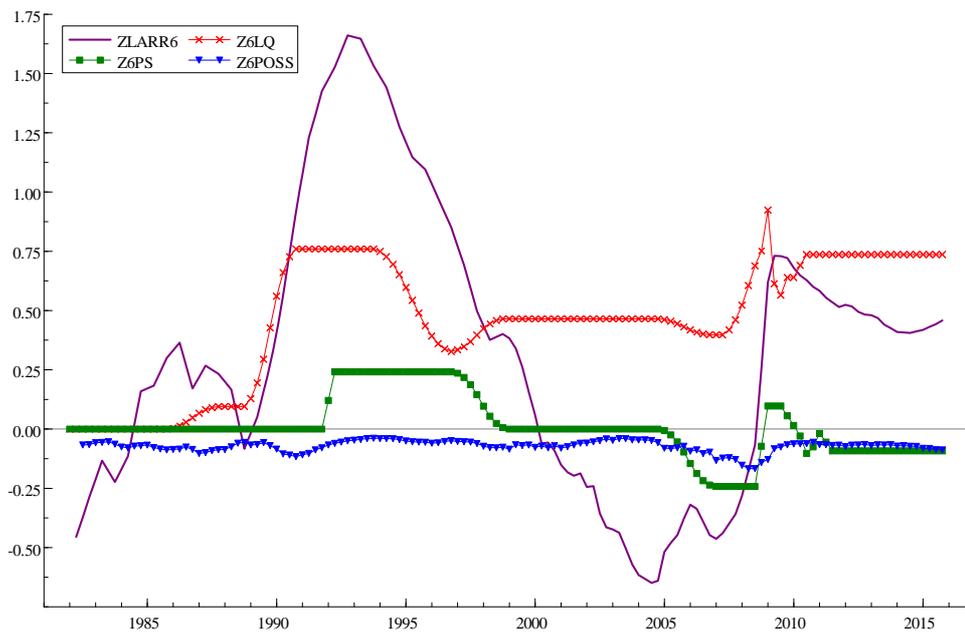
KEY: ZLPOSS=log possessions rate; ZPS= policy function; ZLQ= lending conditions; ZPDSR= debt service ratio; ZPNEGEQ= proportion in negative equity; ZPUP=unemployment.

Figure 3: Estimated long-run contributions of key explanatory variables to the log 6 month arrears rate



Note 1: Variables are level-adjusted for visual purposes. Scenario 1 is assumed for 2011q4 to 2015q4.

Figure 4: Estimated long-run contribution of lending standards and policy shift proxies to the log 6 month arrears rate



Note 1: Variables are level-adjusted for visual purposes. Scenario 1 is assumed for 2011q4 to 2015q4.

KEY: ZLARR6=log 6 month arrears rate; Z6PS= forbearance policy shift function; Z6LQ= lending conditions; Z6POSS= measurement factor; ZLDSR= debt service ratio; Z6NEGEQ= proportion in negative equity; Z6UP=unemployment.

Appendix 3: Forecast assumptions 2011Q4-2015Q4

A. Underlying OBR numbers from the 2012 Spring statement (March)

	FPEDYC	FUPILO	FMRPTE	FRBM	PCONS	RPCONS
Sep-11	254.2	8.3	1,552	0.9	243.9	220.6
Dec-11	256.2	8.4	1,560	1.1	245.7	221.5
Mar-12	256.0	8.6	1,570	1.1	248.8	221.8
Jun-12	258.8	8.6	1,572	1.0	251.1	222.0
Sep-12	261.4	8.7	1,587	1.0	253.8	222.8
Dec-12	264.1	8.7	1,599	1.0	255.8	223.1
Mar-13	265.2	8.7	1,615	0.9	258.2	223.9
Jun-13	266.4	8.6	1,625	0.9	260.8	224.8
Sep-13	268.7	8.5	1,646	0.9	263.5	225.8
Dec-13	271.8	8.4	1,666	0.8	266.6	227.1
Mar-14	275.1	8.3	1,688	0.8	269.7	228.4
Jun-14	277.9	8.1	1,706	0.9	273.0	229.8
Sep-14	280.8	8.0	1,732	1.0	276.4	231.3
Dec-14	284.7	7.8	1,758	1.1	280.1	233.0
Mar-15	287.3	7.6	1,786	1.2	284.1	234.9
Jun-15	291.5	7.3	1,808	1.4	288.1	236.7
Sep-15	295.5	7.1	1,840	1.6	292.2	238.6
Dec-15	299.8	6.8	1,871	1.7	296.3	240.5
Mar-16	302.9	6.6	1,904	1.9	300.3	242.2
Jun-16	306.7	6.4	1,932	2.1	304.4	244.0
Sep-16	310.0	6.2	1,970	2.2	308.5	245.8
Dec-16	314.7	6.0	2,006	2.4	312.7	247.5
Mar-17	318.5	5.8	2,044	2.6	316.9	249.4

FPEDYC	Household Disposable Income (£ Billion Current Prices, Seasonally Adjusted) (ONS Economic Accounts, identifier: RPHQ)
FUPILO	ILO unemployment rate, all aged 16 and over (ONS identifier: MGSX)
FMRPTE	Household financial liabilities (ONS Economic Accounts, identifier: NNPP)
FRBM	Three-month interbank rate (ONS Financial Statistics, Table 7.10, identifier: AMIJ)
PCONS	Household and non-profit institutions serving households final consumption expenditure (ONS Economic Trends Table 2.5, identifier: RPQM)
RPCONS	Household and non-profit institutions serving households final consumption expenditure (ONS Economic Trends Table 2.5, identifier: NPSP)
House prices	Annual growth rates from Table 3.6: Detailed summary of central forecast, from published March-2012-EFO-charts-and-tables.xls

Source: <http://budgetresponsibility.independent.gov.uk/category/publications/>

Our calculations

The private consumption deflator is constructed from households' final consumption expenditure.

The private consumption deflator is used to deflate household disposable income.

The population forecasts of Oxford Economics are used in preference to OBR forecasts as the latter cover LFS household population, all aged 16 and over (ONS identifier: MGSL) and not working age population (i.e. those over 65 years of age are included).

LIBOR, the interest rate above, is adjusted with our own forecasts of the premium between the mortgage rate and LIBOR, see table below. The final rate is divided by 100.

The quarterly growth rate of house prices is derived from annual rates of growth forecast by the OBR, assuming quarterly rates are 25 percent of corresponding annual rates. The annual rates are -0.4, 0.1, 2.5, 4.5 in 2012-2015 respectively.

The growth rate of household financial liabilities is used to forecast the mortgage stock.

Growth rates are constructed for population, real income, household financial liabilities and the private consumption deflator.

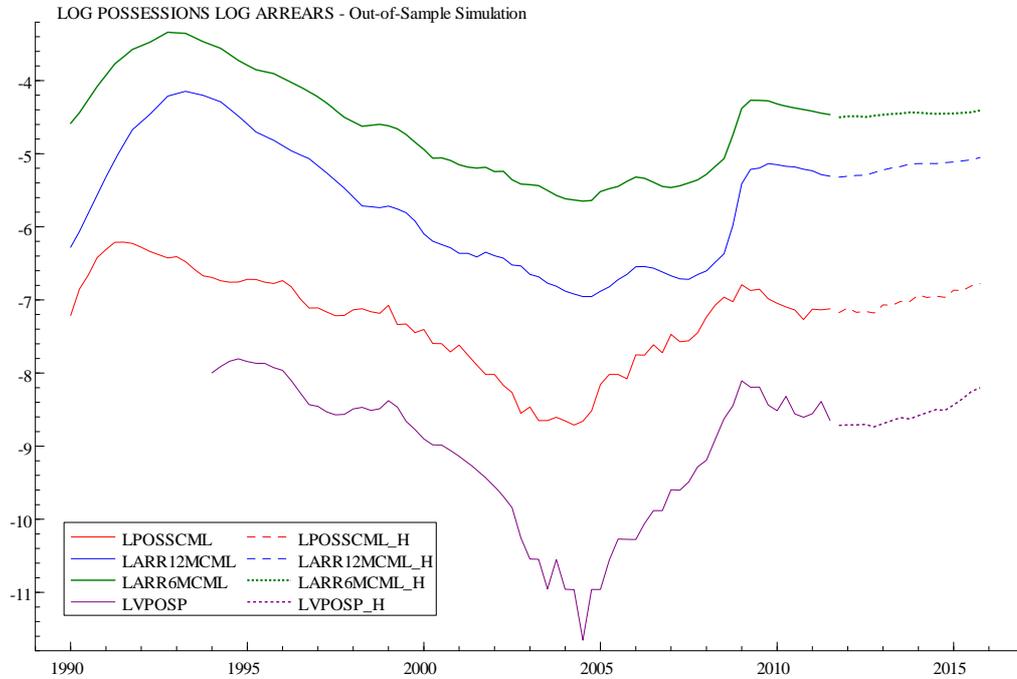
B. Increments for the high growth and the low growth scenarios

	Quarterly rates increment				Quarterly growth rates increments						Mortgage rate premium
	<i>Unemployment rate</i>		<i>Mortgage Rate</i>		<i>Earnings</i>		<i>House Prices</i>		<i>Mortgage Lending Stock</i>		
	<i>negative variant</i>	<i>positive variant</i>	<i>negative variant</i>	<i>positive variant</i>	<i>positive variant</i>	<i>negative variant</i>	<i>positive variant</i>	<i>negative variant</i>	<i>positive variant</i>	<i>negative variant</i>	
Dec-11	0.2	0	0.002	0	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0255
Mar-12	0.4	-0.1	0.004	0	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.025
Jun-12	0.6	-0.2	0.006	0	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0265
Sep-12	0.8	-0.3	0.008	0	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Dec-12	0.9	-0.4	0.01	0	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Mar-13	1	-0.5	0.012	0	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Jun-13	1	-0.5	0.014	0	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Sep-13	1	-0.5	0.016	-0.001	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Dec-13	1	-0.5	0.018	-0.002	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Mar-14	1	-0.5	0.018	-0.003	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Jun-14	1	-0.5	0.018	-0.004	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Sep-14	1	-0.5	0.018	-0.005	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Dec-14	1	-0.5	0.018	-0.006	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Mar-15	1	-0.5	0.018	-0.006	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Jun-15	1	-0.5	0.018	-0.007	0.005	-0.005	0.0075	-0.0075	0.002	-0.002	0.0275
Sep-15	1	-0.5	0.018	-0.006	0.005	0	0	0	0	0	0.0275
Dec-15	1	-0.5	0.018	-0.006	0.005	0	0	0	0	0	0.0275

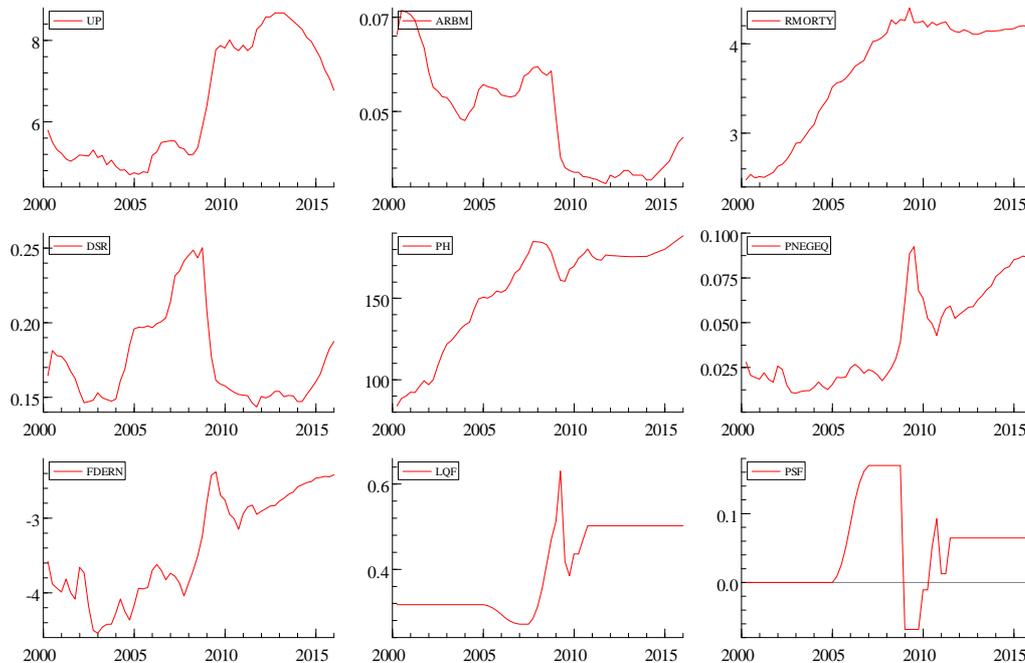
C. Oxford Economics scenarios Proprietary data

Appendix 4: Pictures of forecast scenarios and assumptions

SCENARIO 1: Base scenario OBR

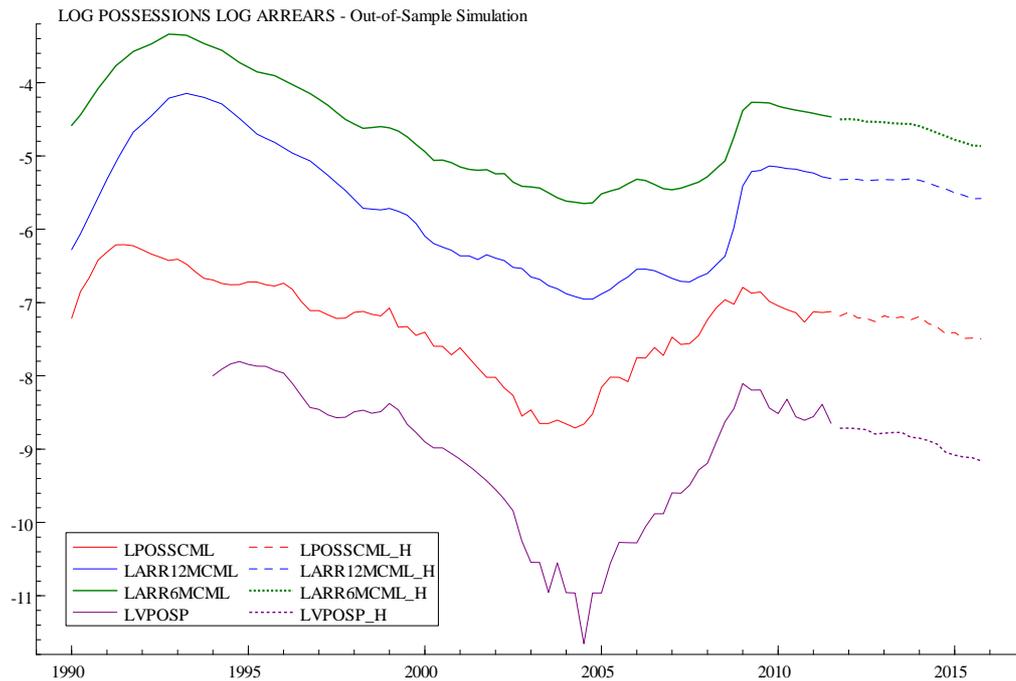


KEY: Order of coloured lines: highest to lowest: LARR6MCML, LARR12MCML, LPOSSCML, LVPOSP

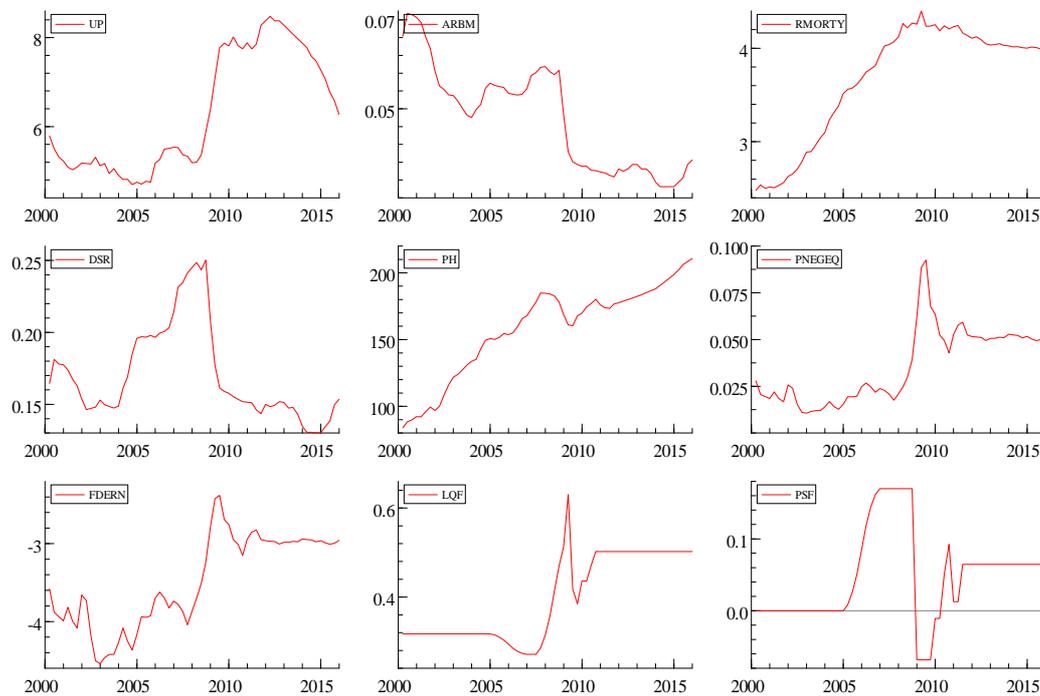


UP=unemployment, ARBM=mortgage rate; RMORTY=average mortgage over average income; DSR= debt service ratio; PH=house prices; PNEGEQ=proportion in negative equity; FDERN=log(pnegeq); LQF=lending conditions; PSF=forbearance policy shift function.

SCENARIO 2: OBR-base with High growth scenario

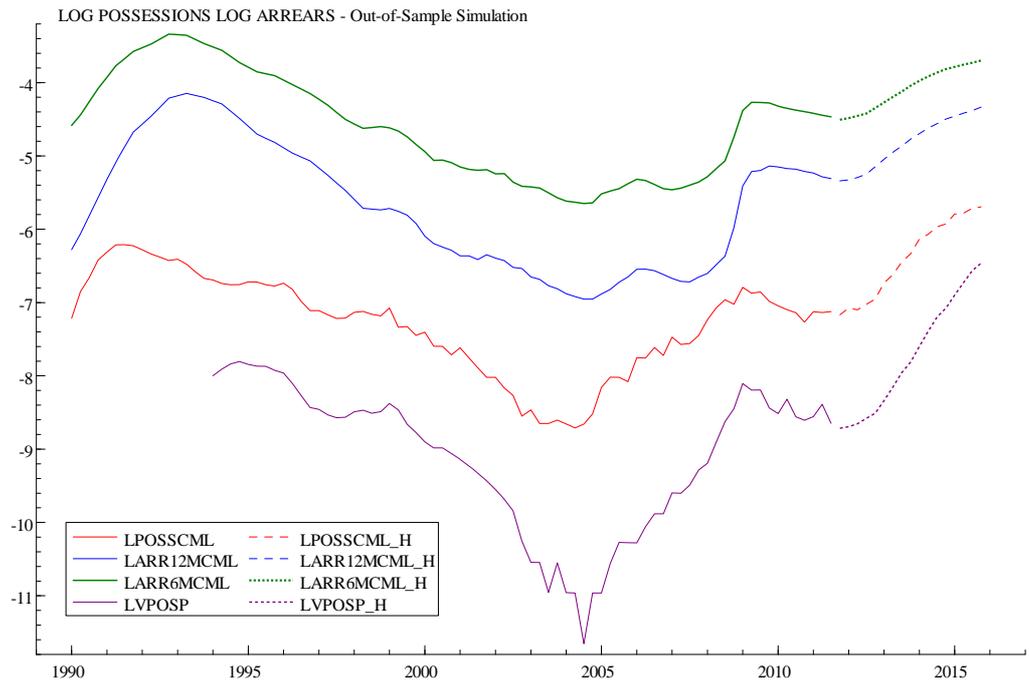


KEY: Order of coloured lines: highest to lowest: LARR6MCML, LARR12MCML, LPOSSCML, LVPOSP

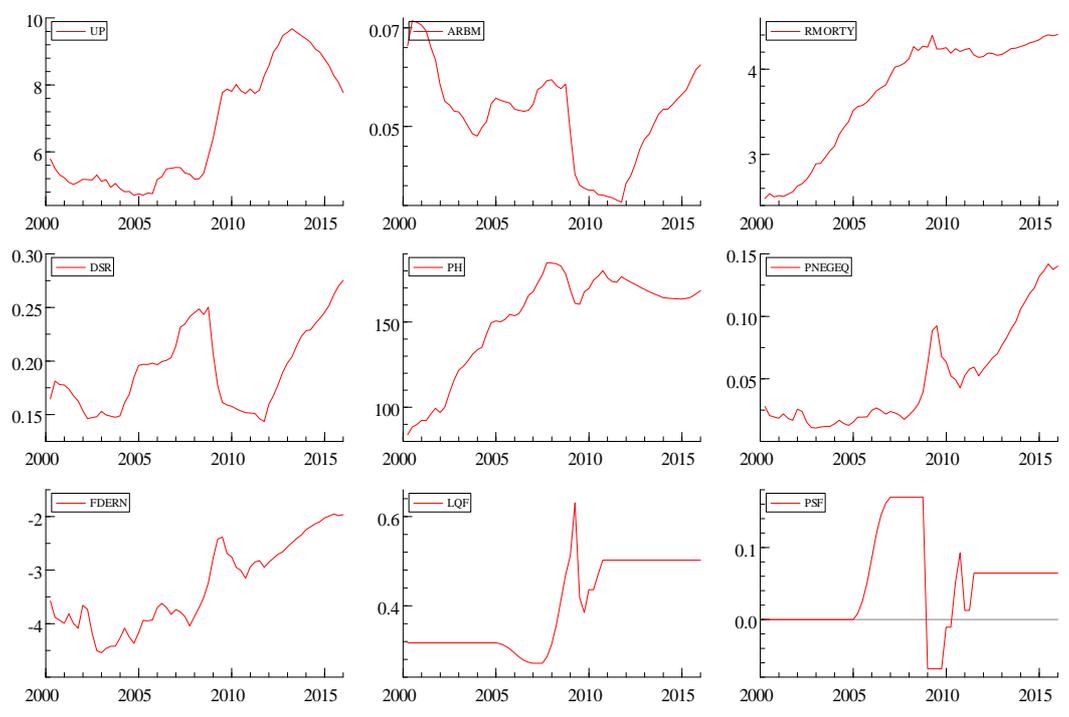


UP=unemployment, ARBM=mortgage rate; RMORTY=average mortgage over average income; DSR= debt service ratio; PH=house prices; PNEGEQ=proportion in negative equity; FDERN=log(pnegeq); LQF=lending conditions; PSF=forbearance policy shift function.

SCENARIO 3: OBR-base with Low growth scenario

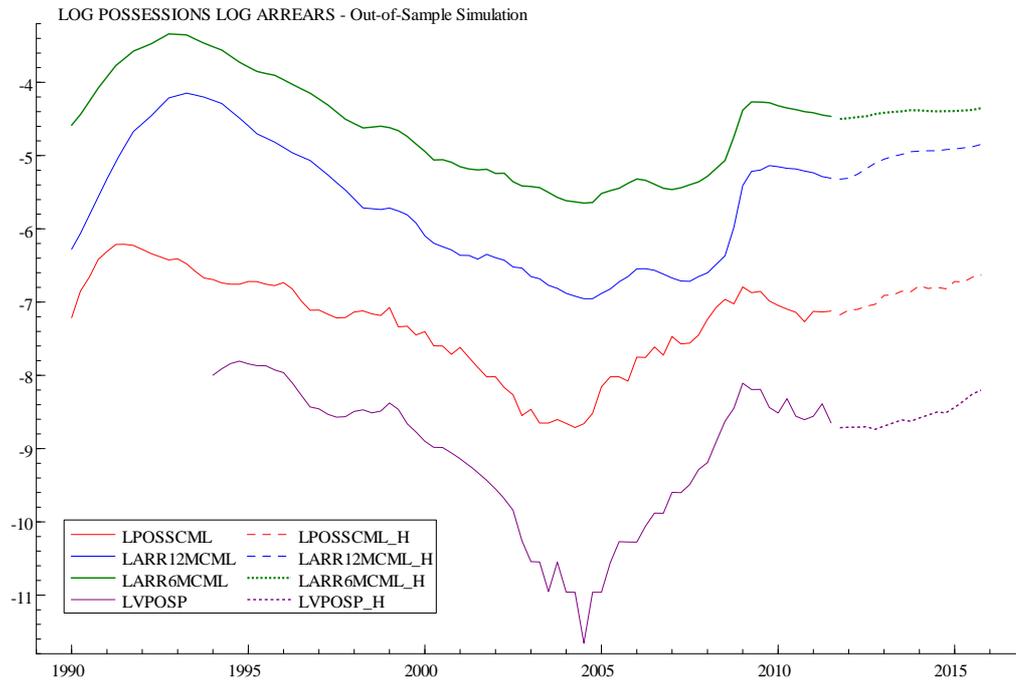


KEY: Order of coloured lines: highest to lowest: LARR6MCML, LARR12MCML, LPOSSCML, LVPOSP

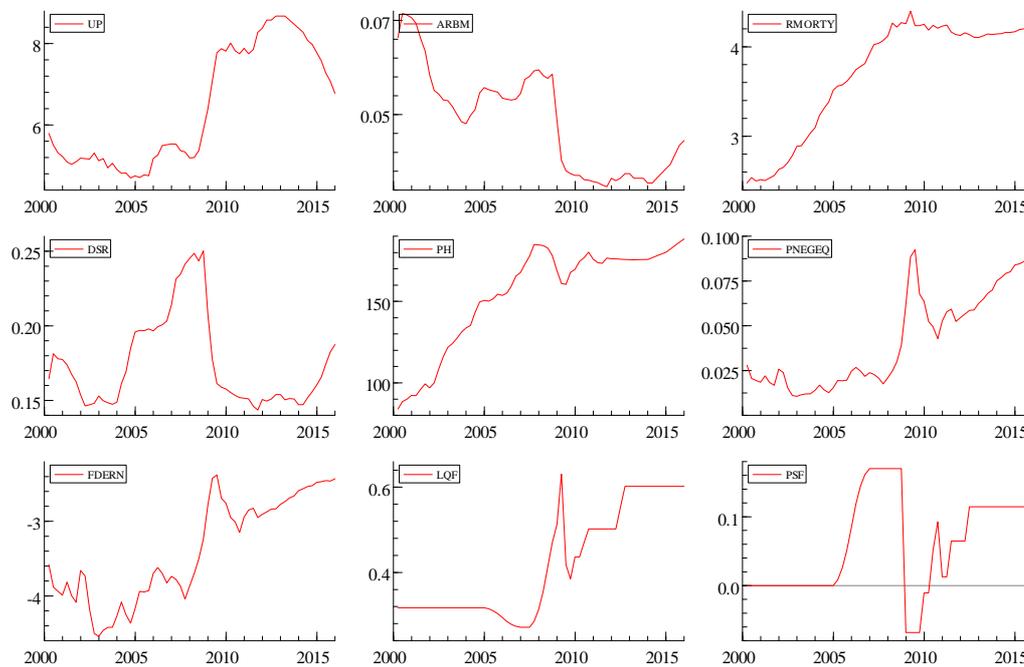


UP=unemployment, ARBM=mortgage rate; RMORTY=average mortgage over average income; DSR= debt service ratio; PH=house prices; PNEGEGQ=proportion in negative equity; FDERN=log(pnegseq); LQF=lending conditions; PSF=forbearance policy shift function.

SCENARIO 4: OBR-base with sensitivity (worse forbearance and loan quality)

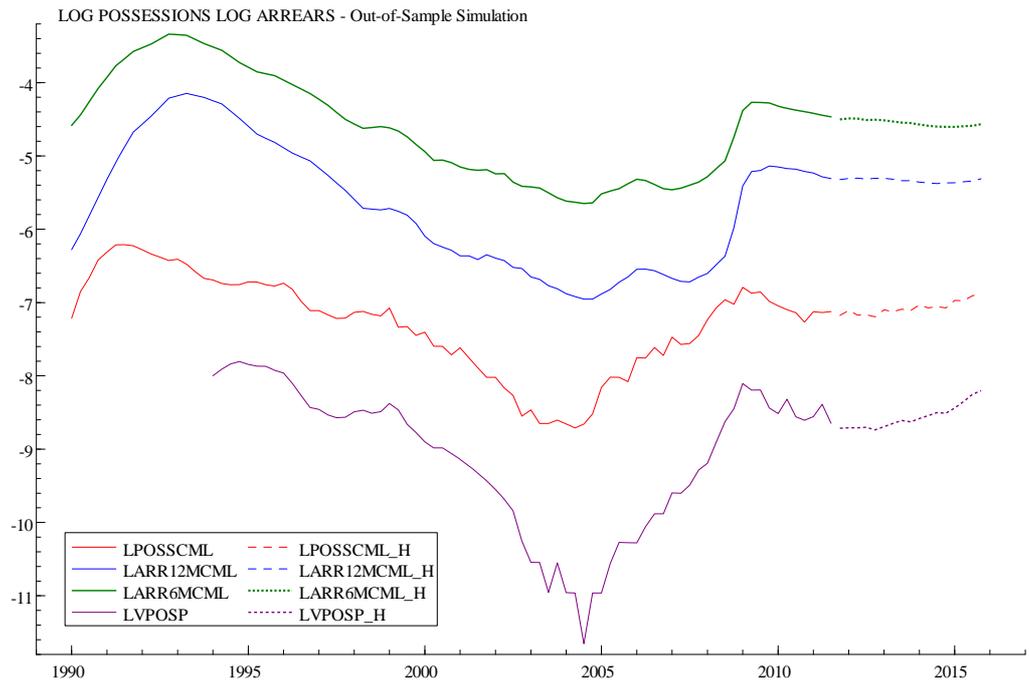


KEY: Order of coloured lines: highest to lowest: LARR6MCML, LARR12MCML, LPOSSCML, LVPOSP

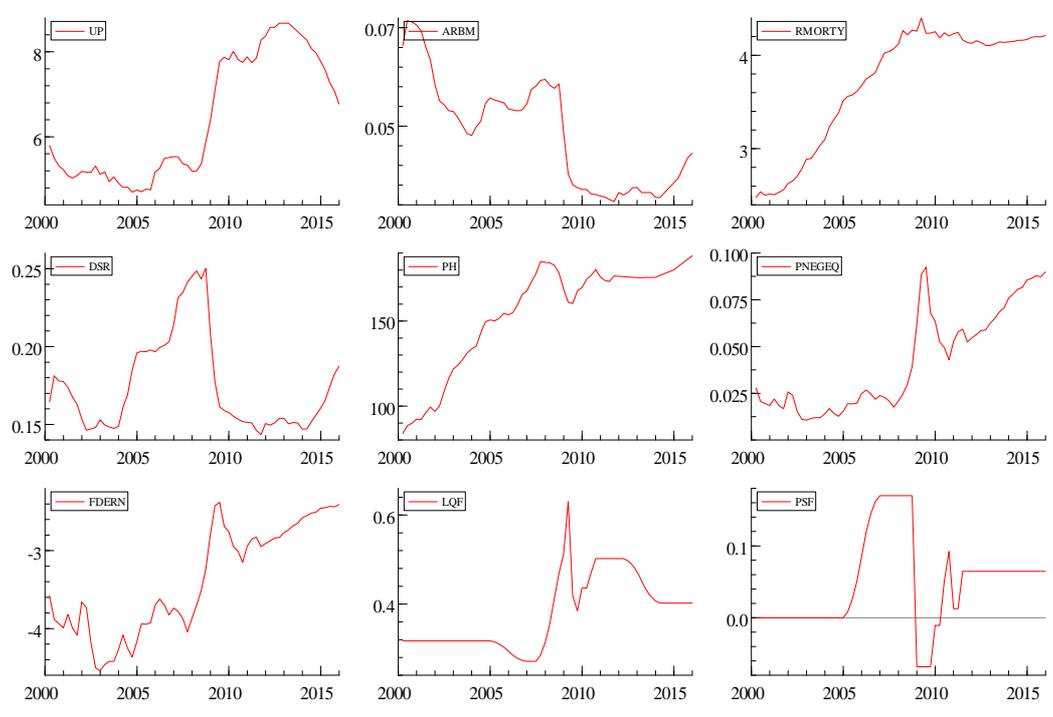


UP=unemployment, ARBM=mortgage rate; RMORTY=average mortgage over average income; DSR= debt service ratio; PH=house prices; PNEGEQ=proportion in negative equity; FDERN=log(pnegeq); LQF=lending conditions; PSF=forbearance policy shift function.

SCENARIO 5: OBR-base with sensitivity (improved loan quality)

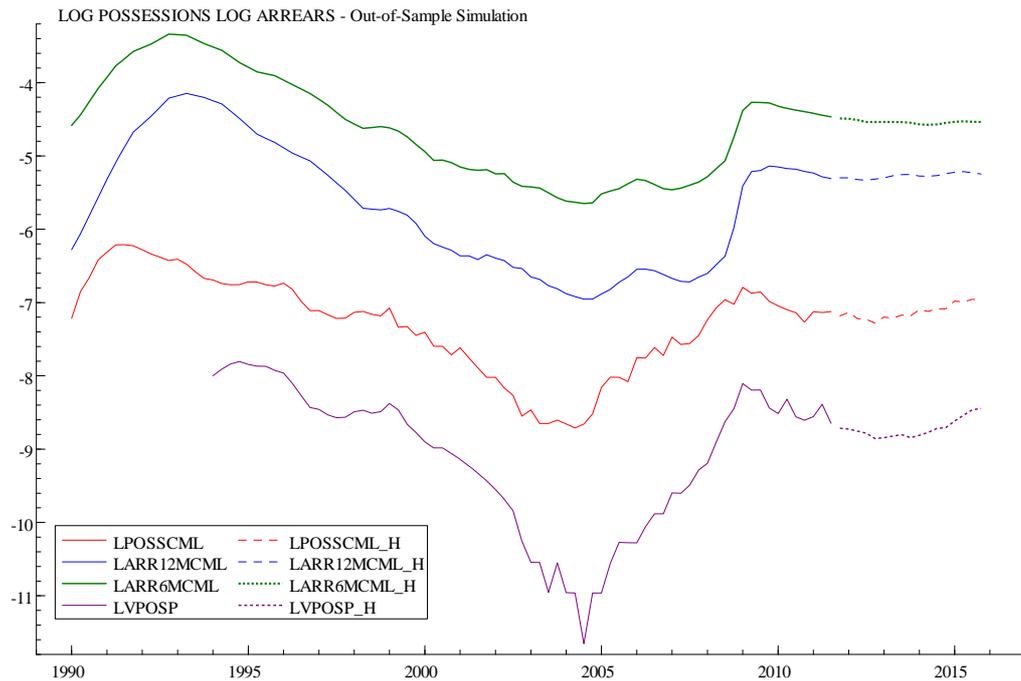


KEY: Order of coloured lines: highest to lowest: LARR6MCML, LARR12MCML, LPOSSCML, LVPOSP

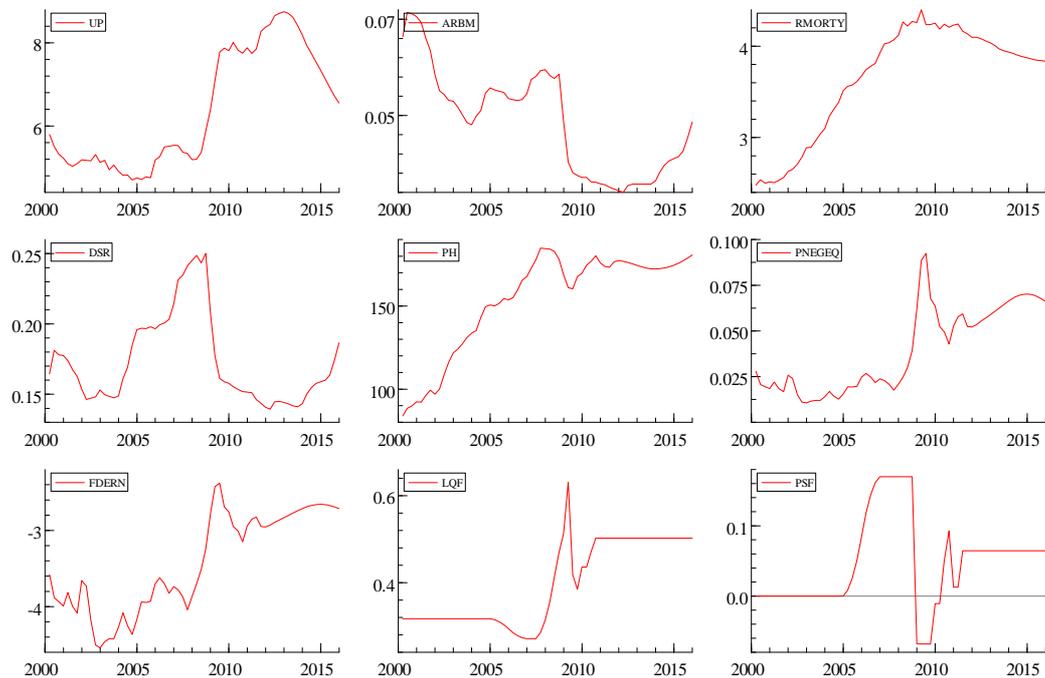


UP=unemployment, ARBM=mortgage rate; RMORTY=average mortgage over average income; DSR= debt service ratio; PH=house prices; PNEGEQ=proportion in negative equity; FDERN=log(pnegeq); LQF=lending conditions; PSF=forbearance policy shift function.

SCENARIO 6: Oxford Economics base scenario



KEY: Order of coloured lines: highest to lowest: LARR6MCML, LARR12MCML, LPOSSCML, LVPOSP



UP=unemployment, ARBM=mortgage rate; RMORTY=average mortgage over average income; DSR= debt service ratio; PH=house prices; PNEGEQ=proportion in negative equity; FDERN=log(pnegeq); LQF=lending conditions; PSF=forbearance policy shift function.

Appendix 5: Forecast results for arrears and possessions 2011Q4-2015Q4

SCENARIO 1 OBR Base Forecast quarter	Properties taken into possession in period/no.	Loans in arrears ≥12 months/no.	Loans in arrears ≥6 months/no.
2011q1	9200	61000	138200
2011q2	9100	57800	134000
2011q3	9200	56400	131100
2011q4	8738	55732	126698
2012q1	9348	56576	128247
2012q2	8796	57237	128754
2012q3	8911	57409	127348
2012q4	8749	59646	129917
2013q1	9778	61856	131783
2013q2	9731	63681	133275
2013q3	10272	65083	134308
2013q4	10246	67319	136435
2014q1	11245	67831	136123
2014q2	10863	67957	134848
2014q3	11097	68003	134240
2014q4	10902	68934	134540
2015q1	12054	69586	134967
2015q2	11994	70680	136313
2015q3	12809	71753	137715
2015q4	13222	74251	141088

SCENARIO 2 OBR HG Forecast quarter	Properties taken into possession in period/no.	Loans in arrears ≥12 months/no.	Loans in arrears ≥6 months/no.
2011q1	9200	61000	138200
2011q2	9100	57800	134000
2011q3	9200	56400	131100
2011q4	8665	55638	126615
2012q1	9139	56021	127269
2012q2	8470	55941	126423
2012q3	8409	54983	123127
2012q4	8058	55560	123051
2013q1	8748	55945	122184
2013q2	8438	55814	120944
2013q3	8619	55983	120036
2013q4	8279	56726	119711
2014q1	8669	55677	116718
2014q2	7913	53772	111630
2014q3	7547	51418	106558
2014q4	6875	49577	101948
2015q1	7016	47094	97013
2015q2	6476	45584	93718
2015q3	6503	43561	90024
2015q4	6454	43692	89350

SCENARIO 3 OBR LG Forecast quarter	<i>Properties taken into possession in period/no.</i>	<i>Loans in arrears ≥12 months/no.</i>	<i>Loans in arrears ≥6 months/no.</i>
2011q1	9200	61000	138200
2011q2	9100	57800	134000
2011q3	9200	56400	131100
2011q4	8811	54707	126168
2012q1	9651	55571	128982
2012q2	9436	57391	133015
2012q3	10183	60166	137774
2012q4	10956	66675	148425
2013q1	13647	73773	160306
2013q2	15299	81364	173161
2013q3	18206	88653	186189
2013q4	20389	97334	201962
2014q1	25028	105265	216173
2014q2	26667	113457	229820
2014q3	29546	120706	242395
2014q4	30797	128715	254480
2015q1	35289	133813	262407
2015q2	35784	139794	271046
2015q3	38207	145046	278229
2015q4	38999	151955	287595

SCENARIO 4 Sensitivity Forecast quarter	Properties taken into possession in period/no.	Loans in arrears ≥12 months/no.	Loans in arrears ≥6 months/no.
2011q1	9200	61000	138200
2011q2	9100	57800	134000
2011q3	9200	56400	131100
2011q4	8738	55732	126698
2012q1	9348	56576	128247
2012q2	9437	59786	130345
2012q3	9876	64549	131841
2012q4	10137	69588	135920
2013q1	11475	73590	138525
2013q2	11557	76505	140391
2013q3	12146	78675	141663
2013q4	12081	81691	144073
2014q1	13159	82593	143845
2014q2	12661	82930	142650
2014q3	12882	83143	142118
2014q4	12643	84374	142535
2015q1	13969	85284	142946
2015q2	13908	86675	144347
2015q3	14862	88048	145736
2015q4	15353	91149	149200

Notes: In the “negative” *Scenario 4*, it is assumed that the forbearance policy shift indicator rises by 0.05 (approximately 5 percent) in 2012Q2, indicating less forbearance; plus, the ‘loan quality’ indicator rises by 10 percent (a deterioration of loan quality) where half of this rise occurs in 2012Q2 and half in 2012Q3.

SCENARIO 5 Sensitivity Forecast quarter	Properties taken into possession in period/no.	Loans in arrears ≥12 months/no.	Loans in arrears ≥6 months/no.
2011q1	9200	61000	138200
2011q2	9100	57800	134000
2011q3	9200	56400	131100
2011q4	8738	55732	126698
2012q1	9348	56576	128247
2012q2	8779	56910	128339
2012q3	8846	56254	125886
2012q4	8600	56998	126579
2013q1	9466	56990	125705
2013q2	9245	56227	123975
2013q3	9573	55194	121957
2013q4	9390	55234	121392
2014q1	10182	54307	119295
2014q2	9774	53703	117133
2014q3	9964	53323	115971
2014q4	9798	53814	115830
2015q1	10855	54066	115882
2015q2	10825	54755	116815
2015q3	11581	55407	117822
2015q4	11968	57185	120552

Notes: In the “positive” Scenario 5, it is assumed there are no shifts in the ‘forbearance shift policy’ indicator but that the ‘loan quality’ indicator falls (improves) gradually to reflect the improved underlying quality of lending in the years since 2007, when lenders became more cautious.

SCENARIO 6 <i>Oxford Economics</i> <i>Forecast quarter</i>	<i>Properties taken</i> <i>into possession in</i> <i>period/no.</i>	<i>Loans in arrears</i> <i>≥12 months/no.</i>	<i>Loans in arrears</i> <i>≥6 months/no.</i>
2011q1	9200	61000	138200
2011q2	9100	57800	134000
2011q3	9200	56400	131100
2011q4	8678	57031	128389
2012q1	9108	57100	127852
2012q2	8384	55805	125702
2012q3	8300	55374	122651
2012q4	7893	56295	122766
2013q1	8582	57305	122933
2013q2	8447	59028	122944
2013q3	8828	60031	122927
2013q4	8735	60246	121855
2014q1	9545	58957	119487
2014q2	9315	58845	118822
2014q3	9672	59518	119698
2014q4	9673	61190	122137
2015q1	10767	62302	124100
2015q2	10643	62988	125192
2015q3	11036	61971	124393
2015q4	10931	61138	124282

Appendix 6: Forecast negative equity and debt to equity ratio 2011Q1-2015Q4

<i>Forecast quarter</i>	<i>Negative Equity</i>	<i>Debt equity ratio</i>	<i>Negative Equity</i>	<i>Debt equity ratio</i>	<i>Negative Equity</i>	<i>Debt equity ratio</i>	<i>Negative Equity</i>	<i>Debt equity ratio</i>	<i>Negative Equity</i>	<i>Debt equity ratio</i>	<i>Negative Equity</i>	<i>Debt equity ratio</i>
	Scenario 1 OBR Base		Scenario 2 OBR HG		Scenario 3 OBR LG		Scenario 4 OBR Base +sensitivity		Scenario 5 OBR Base +sensitivity		Scenario 6 Oxford Economics base	
1995q4	0.155	0.780	0.155	0.780	0.155	0.780	0.155	0.780	0.155	0.780	0.155	0.780
2010q1	0.052	0.703	0.052	0.703	0.052	0.703	0.052	0.703	0.052	0.703	0.052	0.703
2010q2	0.049	0.699	0.049	0.699	0.049	0.699	0.049	0.699	0.049	0.699	0.049	0.699
2010q3	0.043	0.687	0.043	0.687	0.043	0.687	0.043	0.687	0.043	0.687	0.043	0.687
2010q4	0.053	0.706	0.053	0.706	0.053	0.706	0.053	0.706	0.053	0.706	0.053	0.706
2011q1	0.058	0.715	0.058	0.715	0.058	0.715	0.058	0.715	0.058	0.715	0.058	0.715
2011q2	0.059	0.718	0.059	0.718	0.059	0.718	0.059	0.718	0.059	0.718	0.059	0.718
2011q3	0.052	0.706	0.052	0.706	0.052	0.706	0.052	0.706	0.052	0.706	0.052	0.706
2011q4	0.055	0.710	0.052	0.705	0.058	0.716	0.055	0.710	0.055	0.710	0.052	0.706
2012q1	0.056	0.714	0.051	0.705	0.062	0.723	0.056	0.714	0.056	0.714	0.053	0.709
2012q2	0.059	0.718	0.051	0.705	0.067	0.732	0.059	0.718	0.059	0.718	0.055	0.713
2012q3	0.059	0.719	0.049	0.702	0.070	0.737	0.059	0.719	0.059	0.719	0.057	0.716
2012q4	0.063	0.726	0.051	0.705	0.077	0.748	0.062	0.726	0.063	0.726	0.059	0.720
2013q1	0.065	0.731	0.051	0.706	0.083	0.757	0.065	0.731	0.065	0.731	0.061	0.723
2013q2	0.068	0.737	0.051	0.708	0.090	0.768	0.068	0.737	0.068	0.737	0.063	0.727
2013q3	0.071	0.741	0.051	0.708	0.096	0.776	0.070	0.741	0.071	0.741	0.064	0.731

Forecast quarter	Negative Equity	Debt equity ratio										
2013q4	0.076	0.749	0.053	0.712	0.106	0.789	0.075	0.749	0.076	0.749	0.066	0.735
2014q1	0.078	0.753	0.052	0.712	0.112	0.798	0.077	0.753	0.078	0.753	0.068	0.738
2014q2	0.080	0.758	0.052	0.712	0.118	0.807	0.079	0.758	0.081	0.758	0.069	0.740
2014q3	0.081	0.760	0.051	0.710	0.123	0.814	0.080	0.760	0.082	0.760	0.070	0.742
2014q4	0.085	0.766	0.052	0.712	0.132	0.825	0.084	0.766	0.086	0.766	0.070	0.744
2015q1	0.086	0.768	0.050	0.710	0.136	0.831	0.085	0.768	0.086	0.768	0.070	0.744
2015q2	0.087	0.771	0.049	0.709	0.142	0.839	0.086	0.771	0.088	0.771	0.069	0.744
2015q3	0.087	0.771	0.050	0.710	0.138	0.837	0.085	0.771	0.087	0.771	0.068	0.743
2015q4	0.089	0.775	0.052	0.714	0.140	0.842	0.088	0.775	0.090	0.775	0.066	0.742

Notes: See Appendix 5 for summary of the sensitivity assumptions in *Scenarios 4 and 5*.

Appendix 7: Annualised results 2011-2015

<i>Forecast year</i>	<i>Possessions</i>	<i>Arrears 12 months</i>	<i>Arrears 6 months</i>	<i>Possessions</i>	<i>Arrears 12 months</i>	<i>Arrears 6 months</i>	<i>Possessions</i>	<i>Arrears 12 months</i>	<i>Arrears 6 months</i>
	Scenario 1: OBR Base			Scenario 2: OBR HG			Scenario 3: OBR LG		
2011	36200	54100	125500	36200	54100	125500	36200	54100	125500
2012	35806	59646	129917	34076	55560	123051	40225	66675	148425
2013	40028	67319	136435	34084	56726	119711	67541	97334	201962
2014	44107	68934	134540	31005	49577	101948	112039	128715	254480
2015	50079	74251	141088	26450	43692	89350	148278	151955	287596

<i>Forecast year</i>	<i>Possessions</i>	<i>Arrears 12 months</i>	<i>Arrears 6 months</i>	<i>Possessions</i>	<i>Arrears 12 months</i>	<i>Arrears 6 months</i>	<i>Possessions</i>	<i>Arrears 12 months</i>	<i>Arrears 6 months</i>
	Scenario 4: OBR Base +sensitivity			Scenario 5: OBR Base +sensitivity			Scenario 6: Oxford Economics base		
2011	36200	54100	125500	36200	54100	125500	36200	54100	125500
2012	38799	69588	135920	35573	56998	126579	33684	56295	122766
2013	47259	81691	144073	37674	55234	121392	34592	60246	121855
2014	51345	84374	142535	39718	53814	115830	38204	61190	122137
2015	58092	91149	149200	45229	57185	120552	43377	61138	124283

Notes: See Appendix 5 for summary of the sensitivity assumptions in *Scenarios 4* and *5*.