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# How many in negative equity? The role of mortgage contract characteristics[1]

*An important precondition for mortgage default is that the borrower currently have negative equity, that is, that the mortgage balance be higher than the value of the property. This feature shows how sensitive the percentage of households in negative equity can be to different aspects of the mortgage contract. The recent large rise in mortgage delinquency and default rates in the United States, compared with the situation in other countries, can be partly explained by the fact that US mortgages were more likely to have characteristics that increased the incidence of negative equity.*

*JEL classification: G21, R21.*

Households generally only default on their mortgages if they run into payment difficulty at the same time as they are in negative equity – that is, when the mortgage has a higher outstanding balance than the property's current value (less selling costs).[2] Households in negative equity cannot clear the debt completely by selling the property. While not sufficient to cause default, negative equity is thus an important precondition for it. In the current US housing bust, housing price falls leading to negative equity have been an important driver of early mortgage defaults (Haughwout et al (2008)). Recent private sector estimates reported in the *Wall Street Journal* (8 October 2008) suggest that as many as one in six US households are in negative equity and hence vulnerable to defaulting. It is therefore worthwhile to explore what factors are more likely to push a household or a pool of mortgages into negative equity.

Widespread negative equity can also have macroeconomic implications. Households which have fallen into negative equity but are still current on their

[1] This special feature was written while the author was on secondment to the BIS. The views expressed in this article are those of the author and do not necessarily reflect those of the BIS or the Reserve Bank of Australia. Any errors and omissions also remain those of the author, who would like to thank Ingo Fender, Goetz von Peter, Jacob Gyntelberg and Frank Packer for useful comments as well as Philippe Hainaut for assistance with the graphs.

[2] Previous literature shows negative equity alone is usually not sufficient to induce mortgage default: other trigger events – job loss, health problems or divorce, for example – are usually also necessary (Barth and Yezer (1983), Vandell and Thibodeau (1985), Deng et al (1996) and Diaz-Serrano (2005)). US data suggest that only around 10% of households that fall into negative equity actually default (Foote et al (2008)).

mortgage repayments are less likely to move to pursue other job opportunities, so labour market performance could deteriorate (Ferreira et al (2008)). This might be one of the drivers for the positive correlation seen between owner-occupation and unemployment rates in some countries (Oswald (1996, 1998)).

This special feature presents simulation results that quantify how much two aspects of the mortgage contract might affect the percentage of mortgage borrowers in negative equity: the rate at which principal is repaid (if at all), and how high the initial loan-to-value (LTV) ratio can be. The results help shed some light on why more US borrowers ended up in negative equity and experienced foreclosure in the early stages of the current US housing bust, compared with previous busts there and in other industrialised countries (Ellis (2008)). An unusually large fraction of new US mortgages originated in recent years did not require any principal to be paid down early in their lives: some were even negative amortisation loans where the loan balance could increase. Mortgages with high initial LTV ratios also became more common. Both developments represented an easing of lending standards, of a kind that was especially conducive to putting borrowers into negative equity.

The paper then shows that the effects of these particular means of easing lending standards were compounded by their distribution. Because many US households tend to refinance their mortgages frequently, a larger fraction of outstanding US mortgages is quite young and has therefore had little time to accumulate equity. Moreover, non-amortising and high-LTV mortgages were especially common in regions where housing prices were rising fastest, and have subsequently fallen the most. This concentration probably also boosted the incidence of negative equity in the United States.

In contrast, in many other countries where housing prices are now falling, negative amortisation mortgages apparently do not exist. High-LTV loans have long been available in countries such as the United Kingdom and the Netherlands, but remain relatively rare in these countries and others (Benito (2006)). These differences in mortgage financing might help explain why negative equity is estimated to remain lower in the United Kingdom (Bean (2008)) and other countries than in the United States, despite similar price falls.

## The mechanics of negative equity and mortgages

Whether a mortgage ends up in negative equity partly depends on how fast it is paid down

An individual mortgage will end up in negative equity if the drop in housing prices from their peak exceeds the combined buffer of: (1) initial equity, which is determined by the LTV ratio; (2) the equity built up by housing price appreciation between the start of the mortgage and the peak of housing prices; and (3) any reduction in principal via repayment since the loan was taken out. This third element of the equity buffer depends on the amortisation method, which determines how quickly the principal is repaid.

Conventional *amortising* mortgages (also known as credit foncier or table mortgages) are the commonest type in the United States and most other industrialised economies. Repayments on these mortgages are a constant nominal amount depending on the initial amount borrowed, the per-period

interest rate and the number of repayments. The remaining principal falls slowly at first, and then more quickly later in the life of the loan, as shown in the left-hand panel of Graph 1 (red line).

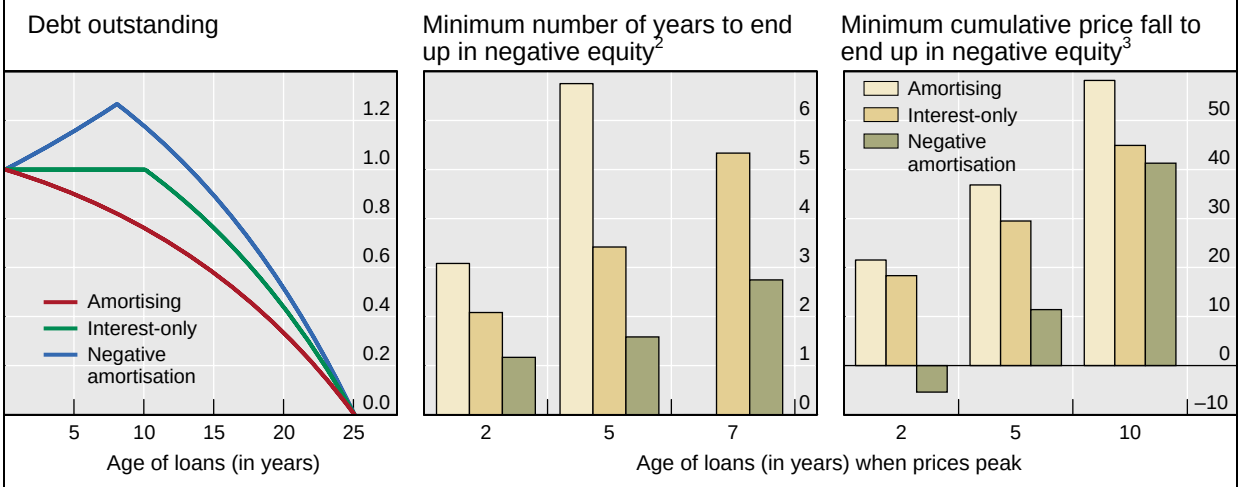
Some types of mortgages that became common in the United States …

*Interest-only* (IO) and *negative amortisation* (NegAm) mortgages do not necessarily involve the repayment of principal in the early years of the life of the loan. Both types of mortgage were widely available in the United States in recent years; Edmiston and Zalneraitis (2007) cite industry data showing that these two types accounted for 7% of all US mortgages originated in 2004, and more than one quarter of those originated in 2006, at the peak of the price boom. In contrast, IO mortgages are relatively rare in most other countries that have experienced price booms of late, and NegAm mortgages are essentially unheard of.

… do not get paid down at first …

A typical IO product available in the United States involves a 10-year IO period, after which the mortgage reverts to a conventional amortising form for the remaining term. The path of the outstanding debt is shown as the green line in the left-hand panel of Graph 1. NegAm mortgages (also known in the US context as option ARMs (adjustable rate mortgages) or pay-option ARMs) allow some of the interest to be deferred and added to the loan balance. Although borrowers could choose to make a larger, amortising payment, in the recent US episode it seems that most of them chose to pay the minimum and accumulate further debt. Once a prespecified threshold is reached, usually expressed as a percentage of the original loan size, the minimum repayment is recalculated ("recast") and the loan reverts to an amortising form. The blue line in the left-hand panel of Graph 1 shows the path of the remaining principal, assuming a threshold of 130% of the original balance, and that half of the 6% interest due is capitalised.

## Debt outstanding and negative equity propensity by mortgage type[1]




[1] Assuming initial LTV ratio of 90%, 25-year term and interest rate of 6% paid at the end of each month. Interest-only loan has a 10-year interest-only period. Negative amortisation loan capitalises half of the interest due until the mortgage balance outstanding reaches 130% of the original loan size. [2] Assuming housing prices rise by 5% per year before the peak, and fall by 10% per year thereafter. Amortising loans aged seven years or more at the peak of prices do not end up in negative equity before they are fully paid off under these assumptions. [3] Cumulative price fall in per cent, assuming housing prices rose by 5% per year before the peak.

Source: Author's calculations. Graph 1

The other panels of Graph 1 illustrate how important early-stage amortisation can be for the subsequent incidence of negative equity. Interest-only and NegAm mortgages, having less accumulated equity, will fall into a negative equity position sooner in a period of declining prices than a mortgage that amortises (centre panel), and they require a smaller overall decrease to do so (right-hand panel). If the outstanding balance has increased since the mortgage was first taken out, either because it is a NegAm loan or because it was subsequently refinanced with a large enough amount of cash taken out, negative equity can occur even if prices do not fall.

… and are therefore more likely to end up in negative equity

## The aggregate incidence of negative equity

The preceding section shows that mortgages that do not amortise in their early years are more prone to forcing a home buyer into negative equity. Stagnant or declining prices also naturally work against the accumulation of positive equity. However, amortisation is a non-linear process. The implications of the mortgage contract's features for the aggregate incidence of negative equity – and thus vulnerability to default – must therefore be explored quantitatively.

The effects of different factors on negative equity are complex …

Graphs 2 through 5 show the aggregate consequences of different mortgage features for the incidence of negative equity in hypothetical populations of mortgages. A new cohort of borrowers is assumed to arrive each month and take out mortgages with a common term and interest rate. If their mortgages all have 25-year terms, as assumed here, there are 300 cohorts to keep track of. Different borrowers within each cohort have different initial LTVs, according to a certain distribution. Prices are assumed to rise and then fall on some prespecified path: the increased borrowing capacity enabled by some types of mortgage does not boost the upswing, and distressed sales by households in negative equity do not exacerbate the fall. In these examples, prices are assumed to fall continuously for three years, with the cumulative decrease shown along the horizontal axes of the graphs. This duration seems realistic given the length of the episodes of falling prices in Canada and the United Kingdom in the early 1990s; there are other episodes, however, such as the 1990s experience of Japan, where prices fell for longer periods.

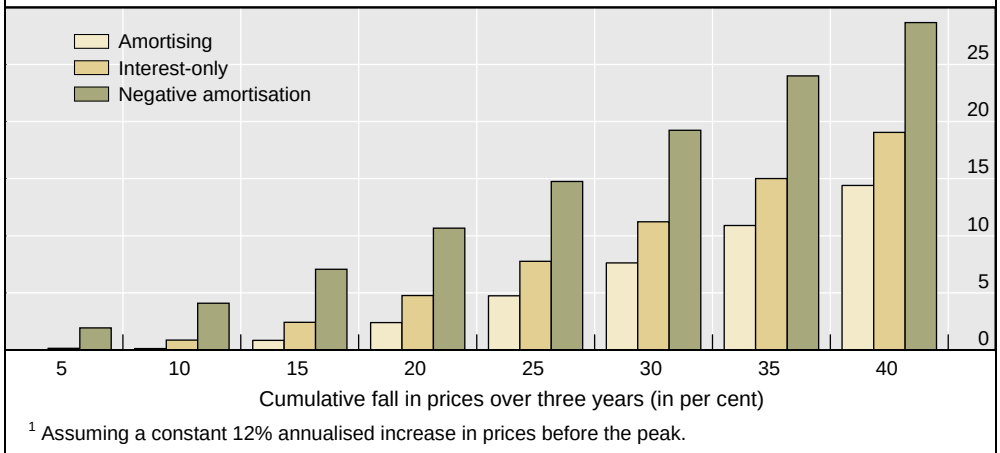
… and must be analysed using numerical simulations

### *Amortisation type*

Graph 2 illustrates how much difference the various mortgage amortisation methods make to the subsequent incidence of negative equity when prices drop. The bars show the percentage of borrowers falling into negative equity for different-sized decreases in housing prices, assuming that prices rose 12% per year in the upswing. This rate of growth is close to the increase in the Case-Shiller 20-city index during the boom phase of the recent US housing cycle. It is assumed that LTV ratios follow a distribution with a mean and a share of borrowers with LTVs above 95% similar to those for the actual distribution of initial LTVs of US mortgages originated in recent

Loans that are not paid down at first always end up in negative equity more often …

Percentage of borrowers in negative equity[1]




[1] Assuming a constant 12% annualised increase in prices before the peak.

Source: Author's calculations. Graph 2

years.[3] Interest-only and negative amortisation loans have consistently higher incidences of negative equity than loans that amortise over their whole life. The effect is even more marked when the previous price growth is slower than 12%. For example, if prices rose 5% per year during the upswing, a 10% decline over three years would put more than 10% of NegAm mortgages into negative equity; only around 1% of IO mortgages and essentially none of the amortising mortgages would be in negative equity following a fall of that size.

… but small changes to the amortisation arrangements make little difference …

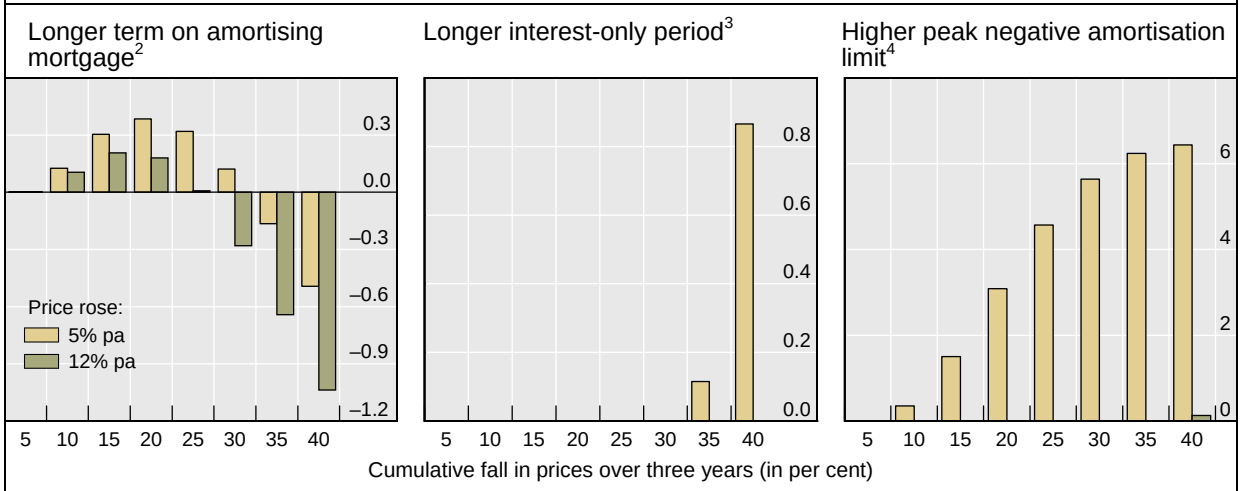
Within each mortgage amortisation type, varying the terms of the mortgage at the margin makes less difference than shifting between the amortisation types. Changing the term of an amortising loan, as shown in the left-hand panel of Graph 3, has two offsetting effects. Amortising the loan over a longer period implies that it is paid down more slowly. For any given age within the life of the longer loan, it will have a marginally higher loan balance than one paid down over a shorter term. Negative equity will therefore be slightly more common for young loans if the overall term is long.

Working against that effect, however, is that longer terms imply that there are more very old loans, with low balances and substantial equity built up through price appreciation. These additional borrowers can offset the first effect in very large downswings. The share of *households* in negative equity could still be higher, even though the share of *mortgages* is smaller. Presumably, if households pay down their loans over a longer term, fewer own their homes outright.

Extending the interest-only period on an IO mortgage to 15 years makes essentially no difference to the incidence of negative equity unless the fall in

[3] Specifically, the results assume LTV ratios follow a beta distribution with shape parameters $\alpha = 12$ and $\beta = 3$, which has a mean of 80% and about 3% of borrowers with an initial LTV between 95 and 100%. Actual initial LTV ratios are not distributed as smoothly as this. As shown by Demyanyk and Van Hemert (2007) for subprime loans, there are usually spikes at round numbers such as 80%. Using a distribution such as the beta has the advantage that the incidence of negative equity can be calculated analytically. For actual pools of mortgages, the calculation would require splitting loans up into different buckets according to their LTV ratios. The different treatment does not bias the results, but does ignore the possibility that negative equity could in reality suddenly jump when these round-number thresholds are reached.

## Effect of changing loan terms on negative equity[1]




[1] Additional borrowers in negative equity, as a percentage of all borrowers, compared with baseline cases. Assumes price fall takes place over three years, LTV ratios are distributed as a beta (12,3) distribution and the interest rate is 6%. Some cases do not change the incidence of negative equity from the base cases, and are therefore shown as zeros. [2] Thirty-year instead of 25-year. [3] Fifteen-year interest-only period instead of 10-year. [4] Loan can increase to 140% of original balance instead of 130%.

Source: Author's calculations. Graph 3

prices is extremely large; in those cases, the incidence of negative equity is a little higher than the base case of 10-year interest-only terms. The reason for this result is that only following very large price falls would the group affected by the change in loan terms – those with mortgages between 10 and 15 years in age – be close to a negative equity position.

… and in some cases, none at all

Similarly, unless the rate of growth in prices before the peak was relatively slow (for example, 5% as shown in the graph), increasing the threshold ratio at which a NegAm mortgage recasts does not necessarily affect the incidence of negative equity, though the effect can be quite significant if it occurs. If borrowers can accumulate additional debt, more of them will end up with debt levels that can be overtaken by a subsequent price fall. However, this effect is dampened by the fact that it takes longer to reach the peak debt level, so the borrowers are also accumulating extra equity via housing price appreciation. A combination of a higher peak allowable debt ratio and a greater share of interest due being capitalised would result in a larger boost to the incidence of negative equity, since this would result in the peak ratio being reached faster.

*Initial loan-to-value ratio*

High-LTV loans are more likely to end up in negative equity …

The effect of the initial LTV on an individual loan's outstanding balance, and thus the susceptibility to negative equity, is directly proportional. However, the aggregate distribution of initial LTVs is not a uniform one, so any curvature of this distribution introduces a further non-linearity into the sensitivity of the aggregate incidence of negative equity to other loan features. The beta family of distributions, such as the one used to construct Graphs 2 and 3, is ideal for exploring this sensitivity: it is bounded between zero and one, and its density has a straightforward analytical expression.

Graph 4 shows the implications for negative equity of different stylised LTV distributions. A lower average initial ratio (66%, similar to the actual

average for Australia in recent years), as represented by the blue line, clearly results in a lower incidence of negative equity.[4] In fact, for small to moderately sized price falls, the incidence of negative equity amongst amortising or IO mortgages is essentially zero. It climbs steadily for distributions with a mean around 80% (the red and green lines), especially if the distribution is skewed to high values, as in the green line. The effect of increasing average LTVs is thus not linear in that average, but depends on the curvature of their distribution.

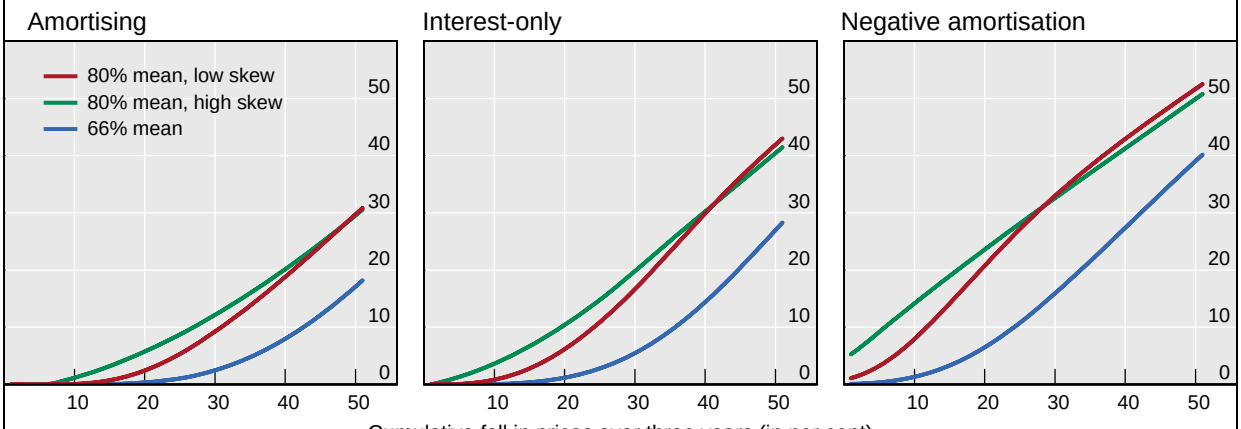
Although the two LTV distributions with the same mean have broadly similar implications for negative equity, there are still notable differences. By way of example, suppose that housing prices fell 15% over three years – not that different from some observers' predictions for both the United Kingdom and the United States. Graph 4 implies that the incidence of negative equity in a pool of IO loans with the highly skewed distribution (green line) would be roughly double that in a pool of loans characterised by the less-skewed distribution (red line). For fully amortising loans, the sensitivity is even starker: only the highly skewed distribution shows a significant fraction of loans in negative equity for price falls of this size.

… and they became more common in the United States in recent years

The practical relevance of these results for explaining recent history is clear. As reported by Demyanyk and Van Hemert (2007) for subprime loans and Ashcraft and Schuermann (2008) more generally, average LTVs on US mortgages increased noticeably over the 2000s housing boom period, and the

## Effect of different LTV distributions on negative equity[1]

Percentage of all mortgages in negative equity; given fall in prices over three years and an interest rate of 6%




[1] Prior to the price fall, prices are assumed to have risen at a rate of 5% per year. Interest-only loans have an interest-free period of 10 years. Negative amortisation loans capitalise half the interest due until the loan balance reaches 130% of the original amount. Initial LTV ratios are assumed to follow beta distributions. The distribution with mean of 66% is the beta distribution with shape parameters (8,4); the distributions with means of 80% have shape parameters of (12,3) (low skew) and (4,1) (high skew).

Source: Author's calculations. Graph 4

[4] The figure for the weighted average LTV in Australia was calculated from the average loan size of newly approved housing loans (excluding refinancing), from Table 1 of the June 2008 release of ABS Cat No 5609.0 (www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/5609.0Jun%202008?OpenDocument), and a weighted average of house and apartment prices obtained from the Commonwealth Bank's Property Value Guide (www.pvg.webcentral.com.au/propertyValueGuideChart.asp), accessed 6 August 2008.

share of new loans with high LTVs (close to or even above 100%) rose. Both shifts would have raised the vulnerability of the US mortgage book to falling into negative equity.

Another factor that could cause sharp jumps in the incidence of negative equity is that mortgages are more likely to have initial LTVs of a round number (eg 80% or 85%) than a fractional amount. This generates spikes in the empirical distribution of LTVs, for example as shown in Demyanyk and Van Hemert (2007). It also implies that there would be discontinuities in the incidence of negative equity, the further prices fall.

*Age of the mortgage book*

The US mortgage market is characterised by relatively frequent refinancing compared with the markets in many other countries (Tsatsaronis and Zhu (2004)). Many subprime mortgages were effectively designed to be refinanced frequently (Gorton (2008)). Thus it seems probable that more US mortgage borrowers would be likely to fall into negative equity, for any given drop in housing prices, because their mortgages are quite young.

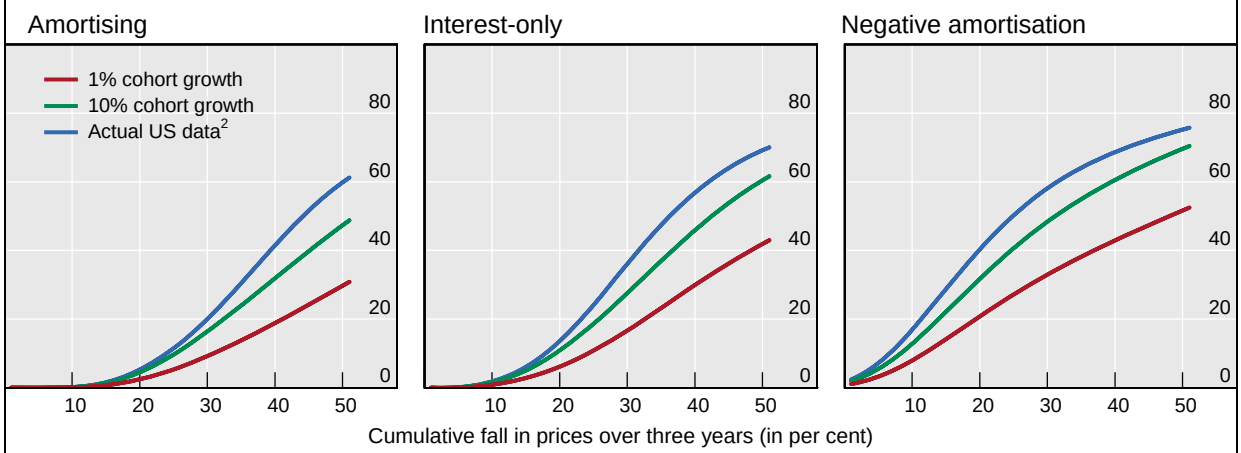
Many US loans were quite new …

Graph 5 provides some quantitative intuition for the importance of this effect. As in the previous simulations shown in Graph 4, housing prices are assumed to increase at an annual rate of 5% per year, before falling for three years, resulting in a cumulative decrease shown on the horizontal axis of each panel of the graph. There is a new cohort of borrowers each month. For the red line, each monthly cohort is assumed to be 1% larger than the cohort that took their mortgages out one year previously; for the green line, the annual growth rate of the cohort size is set at 10%.

The blue line in Graph 5 is intended to show the possible result when the fall in prices has been preceded by a refinancing boom, such that the population of loans is bunched in the youngest cohorts. This is done by assuming that the borrower cohort sizes increase at an annual rate of 2% for

## Effect of population growth on negative equity[1]

Percentage of all mortgages in negative equity; given fall in prices over three years and an interest rate of 6%




[1] Prior to the price fall, prices are assumed to have risen at a rate of 5% per year. Interest-only loans have an interest-free period of 10 years. Negative amortisation loans capitalise half the interest due until the loan balance reaches 130% of the original amount. [2] Proxied by MBS issuance since 2000.

Source: Author's calculations. Graph 5

the first 16 years of history, and then follow the actual path of US mortgage origination volumes since 2000, as proxied by MBS issuance over that period.[5] The resulting profile of cohort sizes has a large bulge of recent borrowers. Low mortgage interest rates during 2003 and 2004 encouraged US households to refinance their mortgages, with the result that 45% of households with a first mortgage had refinanced within the three years up to 2004 (Bucks et al (2006)).

… which also boosts the incidence of negative equity, especially where prices have fallen a long way

The results show that either a faster average growth rate in the number of borrowers or a bulge of recent borrowers raises the incidence of negative equity. However, the difference is only quantitatively important for large falls in prices. Even so, prices have fallen by more than 20% from their peaks in some US cities, notably those in the states of California, Nevada, Arizona and Florida. Many of the cities were attracting new residents in recent years, so the bulge of recent borrowers there is probably even larger than the national average. It is therefore likely that the age profile of mortgages tended to boost the incidence of negative equity in these cities relative to the national average.

*Concentration effects*

The above results have outlined a number of factors likely to increase the incidence of negative equity in a population of mortgages. These include the use of negative amortisation mortgage products, a sizeable fraction of borrowers with initial LTV ratios at or near 100% and a concentration of borrowers having taken their loans out recently. Unless the price fall is large, though, other details of the mortgage contract have less effect.

A regionally concentrated bust would make negative equity more common …

Two other factors probably boosted the incidence of negative equity in the United States beyond either the results presented above or the experience of other countries. First, the decline in housing prices in the United States was quite concentrated in a few states. Averaging across the results in Graph 2 implies that the incidence of negative equity will be higher when the fall in housing prices is skewed to a few centres. For example, for a pool of IO mortgages that experienced 5% annual housing price growth in the upswing, the incidence of negative equity would be 3.7% after a 15% price fall over three years. If instead half the mortgages experienced a drop of 10% and the other half 20%, the aggregate incidence of negative equity would be 4.6%. This could be partly offset by the fact that the cities that experienced the greatest decreases were generally also the ones that earlier had the strongest increases. However, alternative scenarios using different assumptions for price rises and falls imply that past price growth matters little beyond some point: most of the mortgages that end up in negative equity are fairly young and have therefore not had much time to experience any housing price appreciation.

… as would the geographical distribution of certain mortgage products

Second, it is well known that the regional booms in housing prices in the United States went hand in hand with increased usage of so-called "affordability" mortgage products, including IO and NegAm products as well as

[5] The monthly cohort sizes were interpolated from the annual MBS issuance data using the Ginsburgh procedure to ensure that the total monthly cohort sizes added up (in relative terms) to the annual totals.

those with high initial LTVs. For example, the *Financial Times* reported (2 September 2008) LoanPerformance data showing that more than half of all US option ARMs (ie NegAm loans) were for property in California, where the boom and bust in prices were especially large. Comprehensive long-run data on the share of IO and NegAm mortgages by age cohort and geographical region in the outstanding mortgage book (as opposed to new originations) are not available. As an illustrative example, though, suppose California's share of NegAm loans had been 30%, rather than the 10% share of all recent mortgages as reported in Edmiston and Zalneraitis (2007). This would have boosted the incidence of negative equity by nearly 3 percentage points, from 8.2% to 10.9%.[6] The curvature of the results in Graph 4 likewise makes it clear that if LTV ratios are highest in cities where prices subsequently decrease the most, the incidence of negative equity will be higher than if LTVs and price falls were more evenly distributed.

## Implications for cross-country comparisons and credit losses

Some kinds of mortgage products increase the incidence of negative equity …

The simulations presented in this special feature explored the quantitative implications of different loan types and housing price outcomes for the incidence of negative equity amongst home mortgages. These exercises were completely mechanical, with no behavioural content. In particular, they did not allow for prepayment, moving or refinancing. Nonetheless, the results pinpoint the kinds of mortgages that are more likely to fall into negative equity, which is in turn an important precondition for mortgage default.

… which helps explain why it became so common in the United States

The relationships between the characteristics of mortgages and the incidence of negative equity in a housing bust help explain why US households have fallen into negative equity in greater numbers, and experienced more financial distress, than might have been expected from past experience in the United States and elsewhere. US households were more likely to take out high-LTV loans, and loans with interest-only or negative amortisation features, than seems to have been the case in other countries. The refinancing boom of 2003–04, as well as the frequent refinancing embedded in subprime mortgage contracts (Gorton (2008)), meant that an unusually large fraction of US mortgages was quite young, and had built up little equity since origination. In addition, the regional concentration of both the boom and the bust in prices probably added to the incidence of negative equity in the early stages of the bust.

It is difficult to know if a particular individual mortgage is in negative equity …

Estimating the actual incidence of negative equity is complicated by the possibility of transactions at fire sale prices. Housing is heterogeneous and in some neighbourhoods the market will be quite thin. Borrowers that suddenly find themselves in financial difficulty might only be able sell quickly at much-

[6] This hypothetical scenario rests on calculations similar to those presented in Graph 2, assuming that prices rose steadily before the peak at an annual rate of 10%, and dropped 28% thereafter. This is close to the actual falls from their peaks up to June 2008 in the Case-Shiller indices for Los Angeles, San Diego and San Francisco.

reduced prices. Until the property actually comes up for sale, it can be difficult to be sure that it is indeed in negative equity.

… or predict what that means for lenders' credit losses

These simulation results provide some information about the extent of mortgage lenders' probable credit losses, but they should not be over-interpreted. It would be tempting to assume that losses would be proportional to the aggregate incidence of negative equity. However, given negative equity, some borrowers are more prone to default than others. The recent US experience suggests that those most likely to default are the same ones that were more likely to choose mortgages with features that made them most susceptible to falling into negative equity. Interest-only and negative amortisation mortgages seem to have been chosen in greater numbers by the more marginal borrowers, perhaps because they were excessively focused on the affordability of the initial repayment.

Loan losses also depend on the sizes of loans that default …

In addition, because negative equity and defaults are liable to be concentrated in newer loans and those with negative amortisation features, they are also likely to be concentrated amongst larger loans. The simulations reported here focus on the incidence of negative equity by number of loans; when considering loan losses, incidence by value would be a more relevant metric. The figures reported here should therefore be considered a lower bound on the vulnerability of a given loan book to default.

… and the likelihood that mortgages in negative equity actually default …

Finally, cross-country variation in the incidence of negative equity need not translate one for one into the incidence of actual default. Many other factors make borrowers more or less likely to actually default when in negative equity. Previous literature shows that households usually only default on their mortgages if they experience a shock that disrupts their ability to pay. Probabilities of default therefore depend on how frequently those shocks occur, what the penalties for default are, and whether households have other resources they can draw upon to help withstand those shocks.

… which in turn depends on a range of institutional factors

Households in negative equity might be more likely to actually default in the United States, for example, because unexpected health care cost shocks could disrupt their finances in ways that occur less often in countries with other health insurance arrangements (Bernanke (2008)). If a country has a greater rate of churn in its labour market than others, it might also imply that more households face the negative income shock of job loss, for any given unemployment rate. The availability of mortgage payment insurance or other resources to help households withstand income shocks could also affect the propensity for negative equity to translate into actual defaults.

The upsurge in arrears and default rates on US mortgages in recent years had many interrelated causes (Ellis (2008)). Institutional factors that made households in negative equity more prone to default were clearly one set of contributing factors. Perhaps more important, though, is that the types of mortgages on offer in the United States were more likely to have features conducive to pushing the borrower into negative equity if housing prices subsequently fell.

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