

POLICY PAPER

Negative Equity in the Irish Housing Market

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Abstract: Having peaked in early 2007 Irish house prices have fallen steadily. Negative equity occurs if house price falls result in the house value being lower than the outstanding debt. Many in negative equity will be unaffected and will continue to pay their mortgage without difficulty. Negative equity can increase the probability of defaulting if it occurs at the same time as cash-flow problems, possibly caused by illness or job loss. This paper estimates that 116,000 borrowers were in negative equity at the end of 2009, rising to 196,000 borrowers by end-2010. Borrowing at, or close to the price peak, high loan-to-value ratios, interest only mortgages and longer mortgage terms have contributed to higher numbers in negative equity. First-time buyers are more likely to be experiencing negative equity. The research shows that many of those who have mortgages are employed in sectors where employment prospects, to date, remain relatively robust. Policies that assist households overcome a loss in income may help lower the default rate.

I INTRODUCTION

A consequence of recent house price falls is that some households will find themselves in the situation where they owe more than their houses are worth. In other words they are in negative equity. Having peaked in early 2007 house prices in Ireland have fallen steadily. By October 2009 house prices were down nearly 27 per cent from their peak in early 2007 according to the

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permanent tsb/ESRI House Price Index. Estimates of the number in negative equity vary from 170,000 mortgage holders in October 2008 to 150,000 mortgage borrowers in August 2009.¹ A mortgage borrower is in negative equity if a drop in house prices results in the value of the house being lower than the outstanding debt. The level of debt remaining depends on the initial price paid, the initial loan and any equity, giving the loan-to-value ratio, as well as any reduction in the capital balance outstanding as a result of mortgage repayments. Some borrowers will also benefit from equity accumulated from any house price increases that occurred after they purchased their house.

The second part of this article provides an overview of why negative equity matters for the wider economy as well as examining the relationship between negative equity and mortgage default. Section III briefly outlines some of the features of the Irish housing boom. Section IV estimates the number in negative equity in Ireland, primarily based on published data from the Department of the Environment. Estimates as to the numbers in negative equity are sensitive to the underlying assumptions. In the fifth section we explore the impact of a number of alternative assumptions. Following this, using unpublished data from the EU Survey of Income and Living Conditions, the sixth section attempts to provide some indication of those employment sectors where individuals are vulnerable to the impact of negative equity. In Section VII some policies to overcome the problem are examined and finally Section VIII concludes.

II WHY IS NEGATIVE EQUITY IMPORTANT?

In many cases negative equity will not be an issue. Many of those in negative equity will be unaffected and will continue to pay their mortgage without difficulty. Negative equity will only become an issue for a household if they need to sell their house and cannot wait for the housing market to improve. In an analysis of housing market cycles the OECD (2005) show that the average maximum duration for a real house price downturn is just over 6 years. Reinhart and Rogoff (2009) examine the international experience of house price declines and find that, historically, real house price declines have averaged 35.5 per cent and last on average 6 years. However, the presence of negative equity can have important implications for households and for the wider economy.

¹ “170,000 homeowners facing negative equity”, *The Sunday Times*, October 12, 2008. “Living on the edge”, *The Sunday Times*, August 23, 2009.

Negative Equity and the Wider Economy

As the incidence of negative equity increases with falling house prices, negative equity can have the effect of adding to a household's financial difficulties, as well as having a range of implications for the overall economy.

Given the impact of negative equity on the household many of its wider effects on the economy feed through the channel of the consumer. Households in negative equity may consume less as they feel less wealthy but also feel that they no longer have access to funds via housing equity. Disney, Gathergood and Henley (2009) in an analysis of housing capital gains and losses find changing house prices have an asymmetric effect of savings, with a loss in housing wealth (negative equity) associated with higher savings. House price shocks also have a negative impact on consumption. However, they find that house price increases that take the household out of negative equity can lead to a large consumption response as households lower any precautionary saving that had been accumulated.

Negative equity is likely to dampen mobility as the housing market recovers. Being in negative equity may prevent a potential seller from lowering their asking prices sufficiently to attract buyers. Those in negative equity are likely to wait until house prices recover sufficiently to repay their outstanding mortgage. Any recovery in transaction levels is therefore likely to lag recovery in prices. Henley (1998) using the British Household Panel Survey finds negative equity has a serious impact on residential mobility. He estimates that of those in Britain in negative equity in the early 1990s, twice as many would have moved if they had not been in negative equity.

Using US data Ferreira *et al.* (2008), show that negative equity can affect the labour market with workers "locked in" to a location as they are reluctant to sell and realise a loss. Gyourka and Siaz (2003), find that owners with negative equity behave more like renters and re-invest less in their properties. Negative equity can also have implications for the financial system and the availability of credit. The reduction in the value of mortgage based assets can have an adverse effect on lending due to the impact on bank balance sheets. This can lead to a contraction in the availability of credit to both households and firms as banks make provisions for an anticipated increase in expected losses.²

Negative Equity and the Probability of Default

Negative equity is commonly associated with mortgage default, with concerns that the large increase in the numbers in negative equity will result

² There is a good discussion of this issue in Hellebrandt, Kawar and Waldron (2009). Benford and Nier (2007) examine the interaction between mortgage default and capital requirements in the context of Basel II.

in a substantial increase in mortgage defaults. This is based on the view that if the borrower is already struggling with mortgage repayments then the presence of negative equity can reduce the ability to make repayments. This is because in the face of a temporary income shock a borrower could normally withdraw equity from the home or take out a loan to make repayments using housing equity as collateral. Negative equity can reduce the borrower's willingness to make repayments as default is considered preferable to continuing to struggle to make repayments.

However, by itself negative equity does not cause problems repaying a mortgage. Although negative equity is a condition of default and can increase the probability of defaulting, in itself negative equity does not necessarily result in an increase in default. Foote, Gerardi and Willen (2008) show that negative equity does not automatically lead to default. They found that of borrowers likely to be in negative equity in Massachusetts in the early 1990s less than 10 per cent eventually defaulted and based on their model predict for 2008-2010 that between 6-8 per cent of negative equity borrowers will default. Whether or not default occurs depends on a number of factors. Borrowers may still be able to afford the monthly repayments and may expect the loan balance to move below the value of the house at some time in the future. The negative impact on the borrower's credit rating and accompanying difficulty accessing borrowing in the future may make it worthwhile to continue to service the mortgage rather than default. The probability of default increases if negative equity occurs at the same time as a cash-flow problem, possibly caused by illness, divorce or job loss, as the presence of negative equity can reduce the ability to make repayments.

However, work by Wilson (2007) shows that falling property prices can be associated with falling mortgage delinquency rates, as occurred in Hong Kong between 1998 and 2003. In this case, Wilson finds that owners had "... sufficient liquidity to forestall default even though many had negative equity". In the case of Hong Kong the fall in interest rates that happened at the same time as the fall in property prices is seen as an important contribution to low mortgage delinquency rates. Thus, the experience internationally indicates that it is the interaction between the macroeconomic environment and negative equity that contributes to the ultimate default rate.

III THE HOUSING MARKET BOOM

The Irish economy has grown strongly in recent years. Over the period 1995 to 2007 it is estimated that real GDP more than doubled. At the same time income also grew. An important factor has been the increase in

employment levels. The number at work rose by over 65 per cent to reach 2.12 million in 2007.

Accompanying the economic boom over the period 1997 to 2007 the Irish housing market grew significantly. This growth, apart from a short interruption in 2001, is reflected not only in house prices but also in other indicators which show a huge expansion of activity levels within the market. The *permanent tsb/ESRI House Price Index* shows that the housing market peaked in early 2007, having experienced a boom since the mid-1990s. The rapid growth in the housing market was driven by strong economic growth, accompanied by employment growth and increases in disposable income. Demographic trends also contributed to housing demand, with strong population growth, particularly in the main household formation age groups, a fall in average household size and a large net inflow of returning emigrants and immigrants, (see OECD, 2006). Despite rapid price growth the demand for dwellings remained high. Although houses have been highly priced to purchase, homeowners benefited due to low interest rates and high capital gains.

Entry to EMU brought about lower interest rates and competition in the mortgage market also brought about discounted interest rates to attract customers. These factors, by lowering the cost of borrowing for mortgage purposes encouraged homeownership and contributed to a large increase in the number of mortgage loans approved and paid. Department of the Environment, Heritage and Local Government (DoEHLG) statistics show that the number of mortgage loans paid in a single year rose to over 111,000 in 2006, compared to a level of around 57,000 in 1996. Between 2000 and 2008 over 760,700 mortgages were issued. Accompanying this was a large increase in the level of residential mortgage debt outstanding, from close to €14 billion in December 1996 to nearly €148 billion in December 2008.³ The housing market boom also saw financial product development which encouraged or facilitated homeownership. Doyle (2009) shows that the number of Irish mortgage products increased substantially over the course of the boom, from 181 in 1997 to 254 in 2009. Tracker mortgages were introduced.⁴ According to Kelly (2009) tracker rate mortgages account for an estimated 60 per cent of the outstanding variable rate mortgage stock.

Mortgage products with terms longer than the traditional 20 years were introduced. Loan-to-value ratios (LTVs) began to increase and borrowers were able to access 100 per cent mortgages compared to the previous maximum of

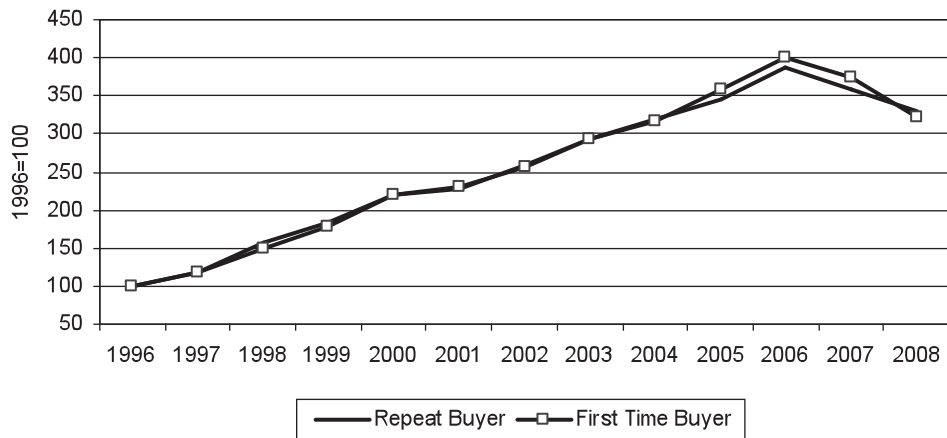
³ Central Bank data, level of mortgage debt outstanding adjusted for securitisation.

⁴ Mortgages where the interest charged equals the main ECB refinancing rate plus a premium set at inception.

92 per cent for most borrowers.⁵ These are, amongst others, identified as key features in the development of the mortgage market in recent years by Doyle (2009). Lending criteria moved from income multiples to a limit based on the ratio of mortgage service cost to income. Addison-Smyth, McQuinn and O'Reilly (2009), model the availability of mortgage credit and find evidence of excess credit in the Irish market, especially since 2004, contributing to the rise in house prices.

Interest only mortgages were also introduced. Finally, lenders began to target the subprime mortgage sector. Ellis (2008a) attributes some of the blame for the housing market meltdown in the United States and the rise in the number of borrowers in negative equity to the easing of lending standards that occurred there.

Figure 1: *Irish House Prices, by Buyer, December Each Year**



*Index based on nominal prices.

Source: permanent tsb/ESRI House Price Index.

IV ESTIMATING THE NUMBER IN NEGATIVE EQUITY

The relationship between the original amount borrowed and the house purchase price, the loan-to-value ratio (LTV), has an important role in determining the extent to which a borrower will find themselves in negative equity. A high LTV, for example a 100 per cent mortgage, leaves a borrower with little or no “buffer” if house prices start to fall soon after they buy a house.

⁵ Mortgage value as a percentage of property value at the inception of the mortgage contract.

The Department of the Environment, Heritage and Local Government provides a breakdown on the range of loan-to-values (LTVs) for repeat and first-time buyers. The data suggests that there has been a move towards high loan-to-value ratios in recent years and that repeat buyers in general have a lower LTV than first-time buyers. Higher loan-to-value ratios mean that recent borrowers, particularly first-time buyers, are more exposed to the risk of negative equity. Over the period covered by the data, 2004-2008, the majority of repeat buyers, between 45 and 50 per cent, have an LTV of less than 70 per cent. The data does also show that there has been an increase in the proportion of repeat borrowers with high loan-to-value ratios. In 2008, 22 per cent of repeat buyers had an LTV of 91 per cent and over, compared with 14 per cent in 2004.⁶ What is most noticeable is the high proportion of first-time buyers (FTB) with a very high loan-to-value ratio. In 2007 and 2008 around one in four first-time buyers had a loan-to-value ratio of 100 per cent. In contrast to repeat buyers less than 20 per cent of first-time buyers have an LTV of 70 per cent or below. The increase in LTVs has been followed by a sharp fall in house prices.

Table 1: *Range of Loan-to-Value Ratios, by Buyer Type*

	<i>Loan-to-Value</i>					
	<i>≤ 70%</i>	<i>71-80%</i>	<i>81-90%</i>	<i>91-95%</i>	<i>96-99%</i>	<i>100%</i>
<i>Percentage of Mortgages Drawdown, by Year of Drawdown</i>						
<i>First-Time Buyer</i>						
2004	17	8	23	46	1	6
2005	16	7	15	47	2	13
2006	16	6	12	27	5	34
2007	19	7	12	28	9	26
2008	18	7	13	31	8	23
<i>Repeat Buyer*</i>						
2004	45	18	24	9	1	4
2005	43	17	24	11	1	5
2006	44	18	23	9	1	6
2007	50	15	20	9	1	5
2008	47	15	17	14	1	7

*Also includes residential investors.

Source: DoEHLG, Housing Statistics.

The Department of the Environment, Heritage and Local Government also provide data on the range of mortgage terms, which shows that there has been

⁶ *Annual Housing Statistics Bulletin*.

a lengthening of mortgage terms. However, there is quite a difference depending on the buyer type. The majority of repeat buyers, 56 per cent in 2008, have a mortgage term of 25 years or less. In sharp contrast, 82 per cent of FTBs have a mortgage term longer than 25 years and 54 per cent, the majority, have a mortgage term of between 31 and 35 years in 2008.

Table 2: *Range of Loan Terms, by Buyer Type*

	Years				
	≤ 20	21-25	26-30	31-35	36+
<i>Percentage of Loans, by Year of Drawdown</i>					
<i>First-Time Buyer</i>					
2004	12	23	43	22	1
2005	8	15	33	41	3
2006	6	11	24	56	4
2007	6	10	19	62	3
2008	7	11	17	54	11
<i>Repeat Buyer*</i>					
2004	41	34	20	5	1
2005	35	33	21	10	1
2006	32	33	20	14	1
2007	31	30	20	18	2
2008	31	25	18	18	7

*Also includes residential investors.

Source: DoEHLG, Housing Statistics.

Although alternative house price measures differ on price levels and the pace of change there is general consensus that prices peaked in 2007. In order to estimate the number of borrowers who might be facing negative equity the following assumptions are made:

- (1) House prices are the December house price for each year from *permanent tsb*. The prices used are for Repeat Buyer and First-Time Buyer. Based on these prices by December 2008 house prices were approximately 15 per cent below their peak, see Figure 1. Forecasts for 2009 and 2010 are guided by the *Quarterly Economic Commentary*, Summer 2009, in which new house prices were forecast to fall by 14 per cent in 2009 and 2010.
- (2) A mortgage term of 25 years is assumed for repeat buyers. Based on Table 2 this is probably reasonable for former owner-occupiers. However, the table also shows that in general FTBs have a longer mortgage term and so a term of 35 years is assumed for FTBs.

- (3) The interest rate is the representative mortgage rate from the CSO databank for December each year. The interest rate in year of drawdown is applied for the mortgage term.⁷ For 2009 and 2010 the interest rate is based on the forecast in the Summer 2009 *Quarterly Economic Commentary* at 3 per cent for both years.
- (4) Department of the Environment, Heritage and Local Government statistics show that for the period 2004-2008 first-time buyers accounted for just over a third of mortgages. This is applied to the total number of loans to allocate between repeat and first-time buyers in 2009 and 2010.
- (5) The range for loan-to-values in 2009 and 2010 is assumed to be an average of previous years (2004-2008). The loan-to-value ratio is based on the year of drawdown and does not take account of the impact of any refinancing. Those who refinanced close to the peak in house prices would not have had a long period to make repayment prior to house prices falling.
- (6) Borrowers are assumed to commence paying back their mortgage immediately. The mortgage is assumed to be repaid in full by the end of the term. In the initial years a higher proportion of the repayment goes towards repaying interest rather than reducing the capital.
- (7) Data is not yet available for full-year loan volumes in 2009. However, statistics for the first half of the year show that loan volumes were 57 per cent lower than in the same period in 2008. To provide loan volume estimates for 2009 we multiply the 2008 total by 0.5, and repeat this for 2010. The average LTV range for 2004-08 is applied to our estimated loan volume.

It should be noted that the repeat buyer data includes residential investors as these are not differentiated from other buyers in the published data. Statistics from the Irish Banking Federation show that residential investment letting mortgages accounted for 12.8 per cent of mortgage lending in 2005 and rose to 18.9 per cent in 2008. Unfortunately, the data is not available for earlier years, pre-boom. However, it does show that “other” mortgages, remortgages and top-ups, currently account for 45-50 per cent of mortgages. The response of those who own “buy to let” properties to negative equity may differ from homeowners as they may view their options purely from an investment perspective.

Using these assumptions we calculate the annual mortgage repayments. As stated above it is also assumed that repayment of the mortgage debt starts immediately. The amount of principal paid off is equal to the repayment less

⁷ Use of a variable interest rate would, in the current environment, lower the repayments. In the early years of a mortgage the bulk of repayment goes towards paying of interest rather than repaying capital. Thus, use of a variable rate is likely to increase the numbers in negative equity. See Section V.

interest due. The mortgage balance is reduced each year, taking account of the fact that in the earlier years of the mortgage term a higher proportion goes towards interest repayment rather than principal reduction. The outstanding balance is compared to the house price in each year. If the mortgage balance is greater than the house price then the borrower is considered to be in negative equity⁸.

The fall in house prices in 2007 resulted in a small number of borrowers in negative equity at the end of the year, 19,525. These are mostly FTBs with high loan-to-value ratios. House price falls in 2008, following declines in 2007, means the number of mortgage borrowers with mortgage debt levels higher than their house price at end-2008 is estimated at over 57,000.

House prices have continued to fall in 2009. It is assumed that the decline is in line with those forecast in the Summer 2009 *Quarterly Economic Commentary*. If these forecasts prove to be correct then by end-2009 house prices will be around 30 per cent lower than peak in nominal terms. Allowing for the repayment of mortgage debt since drawdown the fall in house prices by end-2009 means that the number of mortgage borrowers with mortgage debt levels higher than the price of their house increases to over 116,000, up by 58,000 compared with the end-2008 figure. This represents a doubling of those in negative equity. Those in negative equity now include some who borrowed with a high LTV as far back as 2004. Of those estimated to be in negative equity at the end of 2009, 76.8 per cent are FTBs. This is supported by Table 1 which shows that FTBs are more likely to have a higher loan-to-value ratio.

If, as anticipated, house prices continue to fall in 2010 and using similar assumptions to those outlined above, by the end of 2010, the number of mortgage borrowers in negative equity could rise to over 196,000. Figure 2 shows that borrowers who drew their mortgage down between 2005 and 2007 are most likely to be in negative equity, as are FTBs.

Based on *Census 2006*,⁹ approximately 40 per cent of Irish households are repaying a mortgage or purchasing from a local authority. The most recent *Medium-Term Review* estimates that the number of households in Ireland in 2008 was over 1.5 million. Applying the ratio from *Census 2006* implies over 645,000 households have mortgage debt. Assuming that borrowers in the Department of the Environment data correspond to households then 18 per cent of households who have a mortgage will be in negative equity at end-2009, nearly one in five. By end-2010, 29.6 per cent of households with a mortgage, nearly 1 in 3, will be in negative equity. In the case of FTBs, the number in negative equity would rise to over 125,000 by end-2010.

⁸ See worked example in Appendix.

⁹ Central Statistics Office, *Census 2006*, Volume 6 – Housing.

Figure 2: *Number of Mortgage Borrowers in Negative Equity by End-2010 (By Year of Loan Drawdown)*

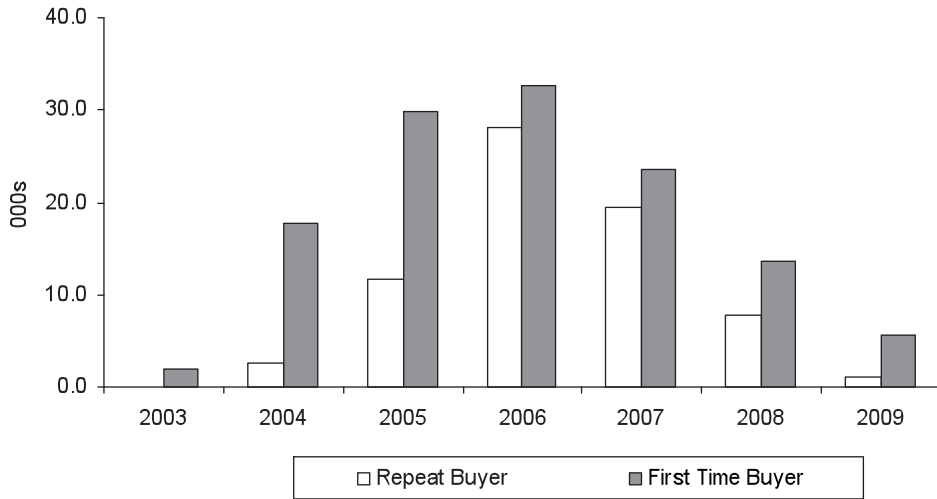
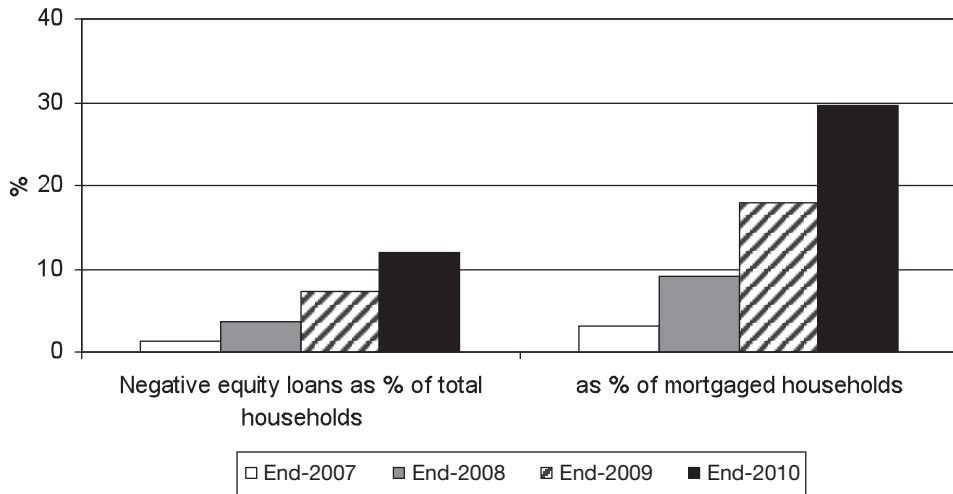


Figure 3: *Proportions in Negative Equity, End-2007 to End-2010*



How does the situation in Ireland compare internationally? Estimates produced for the UK suggest that between 7 and 11 per cent of UK owner-occupier mortgage holders were in negative equity in the Spring of 2009, depending on the data source used (Hellebrandt, Kawar and Waldron, 2009). Alternative estimates for the UK by Tatch (2009), put the proportion at the

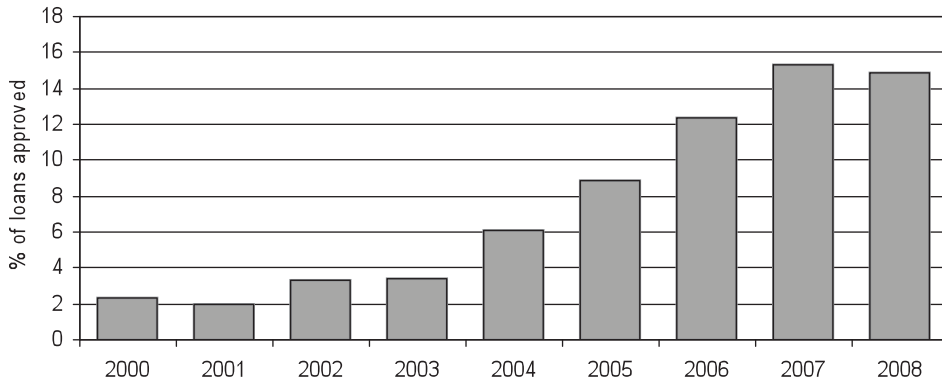
end of 2008 at 13 per cent of homeowners who had taken out mortgages between Q2 2005 and end-2008. Ellis (2008b) quotes numbers for the United States which estimate that over 10 per cent of the US single-family housing stock were already in negative equity in early 2008.

Table 3: *Summary Table, Total*

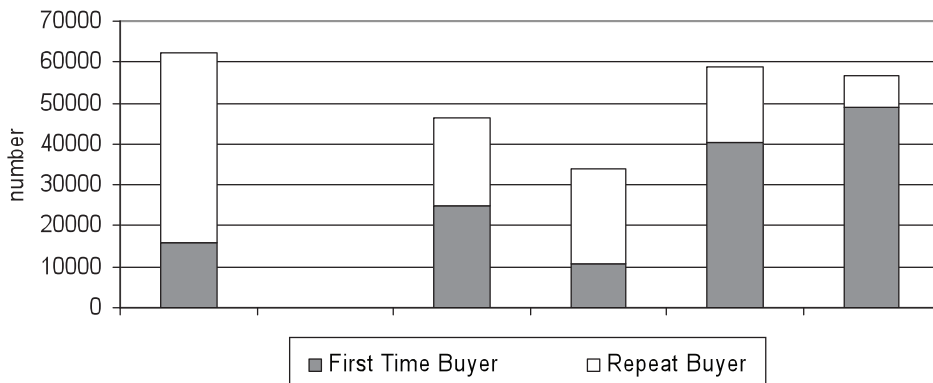
	<i>Estimated Mortgage Loans in Negative Equity</i>	<i>Estimated Number of Households</i>	<i>Estimated Number of Households with Mortgage Debt</i>	<i>Negative Equity Loans as Percentage of Total Number of Households</i>	<i>Negative Equity Loans as Percentage of Households with Mortgage Debt</i>
	(1)	(2)	(3)	(4)=(1)/(2) %	(5)=(1)/(3) %
End-2008	57,389	1,554,648	631,187	3.7	9.1
End-2009	116,083	1,591,983	646,345	7.3	18.0
End-2010	196,015	1,629,195	661,453	12.0	29.6

The numbers may not fully capture the numbers in negative equity given the extent to which top-up mortgages and refinancing took place. The Irish Banking Federation show that around the peak in house prices in 2007 top-up mortgages accounted for approximately 30 per cent of loan draw downs, with re-mortgages accounting for a further 16 per cent. The latter stages of the boom in house prices saw increasing awareness of and demand for interest only mortgages. Given that no capital would be repaid for the portion of the term that is interest only this would increase the number of borrowers in negative equity. Figure 4 shows that the proportion of interest only loans had risen in recent years and accounted for approximately 15 per cent of loans approved. Ellis (2008b) shows that mortgages that do not amortise in their early years are more prone to moving into negative equity.

Based on the data it is also possible to calculate the value by which borrowers are in negative equity at the end of 2010. For 23 per cent, negative equity accounts for less than 5 per cent of the estimated house price. Approximately another 17 per cent have negative equity of between 5 and 10 per cent, while 30 per cent have negative equity between 10 and 20 per cent of the estimated house price. Nearly 29 per cent have negative equity over 20 per cent of the value of the house. It is noticeable that the majority of those with negative equity less than 10 per cent are repeat buyers, whereas the majority over 10 per cent are first-time buyers. Figure 5 also shows that, at end-2010, there will also be a substantial number of borrowers who are “near” negative

Figure 4: *Interest Only Loans as a Percentage of Loans Approved, Ireland*

equity where their existing equity is less than 5 per cent of the value of the house. The numbers in negative equity, combined with the estimated shortfall suggest that the extent of the total shortfall could reach €7.4 billion by the end of 2010, suggesting that the average negative equity is approximately €38,000. Once again it is those who bought close to the peak in house prices and are FTBs who have higher average negative equity.

Figure 5: *Negative Equity, “Near” Negative Equity and Degree of Shortfall, End-2010*

The estimates above suggest that a significant proportion of households, approximately 1 in 3, will be in negative equity by end-2010. Using the forecasts from the ESRI's *Recovery Scenarios*, (Bergin *et al.*, 2009) the analysis is extended to assess how long negative equity will remain an issue for some households. The results indicate that those repeat buyers with a high loan to

value ratio who are in negative equity will remain so until 2016. For first-time buyers in negative equity by the end of 2010 the situation is more serious. First-time buyers with a high loan-to-value ratio will not move back into positive equity until after 2020. These estimates are, of course, dependant on the assumptions made. A more rapid recovery in the housing market, leading to stronger than anticipated house price growth, would see the problem of negative equity resolved sooner.

V SENSITIVITY OF THE ESTIMATES

While Table 3 shows estimates for the number of borrowers in negative equity it should be remembered that the estimates are sensitive to the assumptions underlying them. In order to assess how sensitive the estimates are, this section looks at the change in the numbers based on a series of alternative assumptions.

The base estimates have been prepared assuming a mortgage term of 25 years for a repeat buyer and 35 years for a first-time buyer. Longer mortgage terms, for example 35 years for FTBs, means that less of the principal is paid off in the early years of the mortgage and so increases those exposed to negative equity. If the estimates were produced using a mortgage term of 25 years for first-time buyers, then the numbers in negative equity would be over 7,600 lower at end-2009 and nearly 31,000 lower at end-2010. In the post-boom period it could be argued that access to credit is more difficult and mortgage terms may be curtailed. If it is, therefore, assumed that in 2009 and 2010 repeat buyers can only access a 20 year mortgage and first-time buyers can only access a 25 year mortgage this has the impact of lowering the numbers in negative equity at end-2010 by nearly 3,300.

A similar argument may be made with regard to loan-to-value ratios over the forecast period. If media reports are correct the maximum loan-to-value ratio available at the moment is 92 per cent.¹⁰ Data on the range of LTVs prior to 2004 is not available. A crude “weighted” LTV for the published data gives an LTV of approximately 80 per cent for repeat buyers and close to 90 per cent for first-time buyers. In order to assess the effect of lower LTVs the range of LTVs is adjusted to lower the weighted LTV to 75 per cent for repeat buyers and 85 per cent for FTBs. In effect mortgages with an LTV greater than 96 per cent are eliminated for FTBs. The impact is to lower the numbers in negative equity at end-2010 by 6,500.

¹⁰ The Central Bank’s Bank Lending Survey also points to more restrictive LTVs.

The analysis indicates that the initial loan to value ratio and the mortgage term play an important role in determining if the borrower experiences negative equity when house prices start to fall. As outlined above mortgage product development became a feature of the booming housing market with the introduction of 100 per cent loan-to-value ratios, interest-only mortgages, subprime mortgages, and longer mortgage terms. In an attempt to assess the impact of the changes to mortgage market products we, as an alternative, estimate the numbers in negative equity holding the mortgage term and the distribution of LTVs constant at year 2000 levels. Thus, the maximum mortgage term is assumed to be 25 years for a first-time buyer and 20 years for a repeat buyer. The distribution of LTVs within the categories published by the Department of the Environment, Heritage and Local Government is estimated from unpublished *permanent tsb* data. The majority of repeat buyers had a LTV less than 70 per cent, while the most popular categories for FTBs, 37 per cent of first-time buyers, was an LTV of less than 70 per cent and 30 per cent with an LTV of 90-96 per cent. If the numbers in negative equity are estimated using these assumptions the difference is striking. The number in negative equity at the end of 2008 falls to around 23,000, at the end of 2009 the number falls to around 57,000 and at end-2010 the estimate falls to 80,000.

This counterfactual does not take any account of the fact that tighter credit conditions would have resulted in lower mortgage volumes and may have reduced house price inflation.¹¹ However, the results point to the fact that the easing of mortgage market credit encouraging home ownership has contributed substantially to the estimated numbers in negative equity. This is not unique to Ireland. Ellis (2008b) in an analysis of mortgage contracts and negative equity finds that US mortgage characteristics, (high LTVs, interest only, negative amortisation) help explain why US households have fallen into negative equity in greater numbers than in the past.

The estimates have been prepared using the *permanent tsb*/ESRI House Price Index and house price forecasts from the *Quarterly Economic Commentary*. However, there has been much coverage of anecdotal evidence which suggests that the fall in house prices has been much greater than captured by official statistics. Thus the sensitivity of the estimates to greater house price falls is examined. As an alternative, house prices are assumed to fall by 20 per cent in 2009 and by around 27 per cent in 2010. This would leave house prices 50 per cent lower than their peak in 2006.¹² This more severe house price fall has a dramatic effect on the estimates of those in negative

¹¹ Addison-Smyth, McQuinn and O'Reilly (2009) find that from 2005 onwards "... the relaxation of credit conditions in the Irish financial system contributed significantly to Irish house price growth over the period".

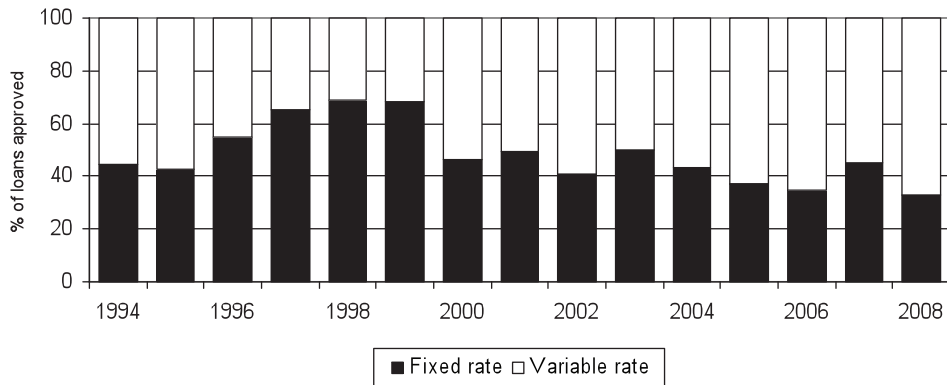
¹² An analysis of international house price cycles by the OECD (2005) shows that the maximum fall experienced, to date, in a downturn was -50.4 per cent.

equity. The numbers increase by nearly 72,500 in 2009 and by nearly 154,000 in 2010.

Table 4: *Alternative Scenarios and Negative Equity Numbers*

	<i>Base Case</i>	<i>FTB Mortgage Term = 25 yrs</i>	<i>Lower Mortgage Terms in 2009 and 2010</i>	<i>Lower LTVs in 2009 and 2010</i>	<i>House Prices Down by 50 per cent from Peak, End-2010</i>
End-2007	19,525	17,578	19,525	19,525	19,525
End-2008	57,389	51,574	57,389	57,389	57,389
End-2009	116,083	108,410	116,083	116,083	188,551
End-2010	196,015	165,101	192,747	189,472	349,715

Figure 6: *Fixed Vs Variable Interest Rate, Mortgage Loans Approved*



Note: The figures on fixed interest rate mortgages relate to mortgages which provide that the interest rate may not be changed, or may only be changed at intervals of not less than one year.

The analysis is undertaken using the assumption of fixed interest rates over the mortgage term. Statistics from the *Annual Housing Bulletin* show that in 2000 there was a large shift towards variable rate mortgages, presumably the impact of joining the Euro and since then variable rate mortgages account for the bulk of mortgage loans approved. Use of a variable interest rate would, in the current environment of low interest rates, lower the mortgage repayments. In the early years of a mortgage the bulk of repayment goes towards paying of interest rather than repaying capital. Thus, use of a variable rate increases the numbers in negative equity. If the analysis were

conducted on the assumption that interest rates vary each year rather than being fixed for the mortgage term then this has the effect of increasing the numbers in negative equity at the end of 2009 by over 21,000 and at the end of 2010 by close to 8,000.

VI WHO IS VULNERABLE?

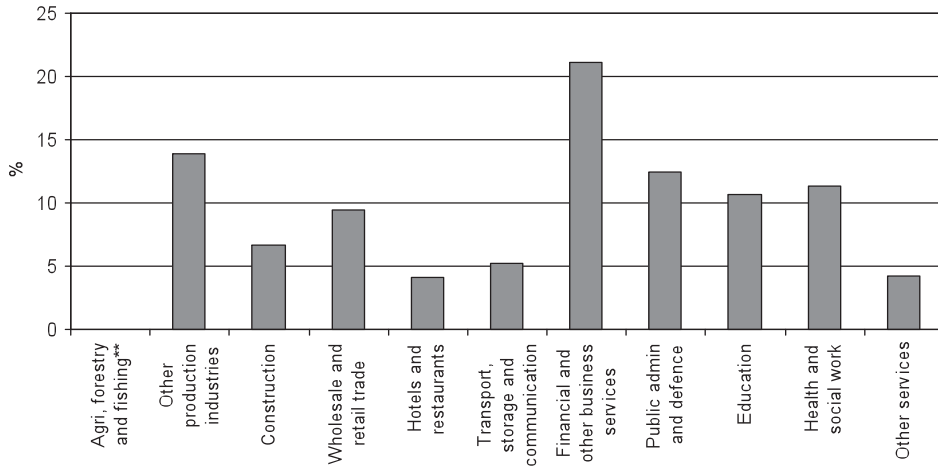
The analysis in Section IV shows that mortgage borrowers in negative equity are likely to be first-time buyers, and/or those with a high loan-to-value. A general conclusion running through much of the research on negative equity, (for example, Haughwot and Okah, 2009; Haughwot, Peach and Tracy, 2008; Foote, Gerardi and Willen, 2008) is that the presence of negative equity does not necessarily result in mortgage default, although it increases the likelihood of default. Many households in negative equity will continue to be able to make monthly mortgage repayments and so will not default. Those who are at most risk of default are those who are in negative equity and who experience a cash-flow problem. These cash-flow problems could be caused by illness, divorce or job loss. Thus, the number of households that default depends not only on negative equity but also on the conditions prevailing in the macro-economy.

The Survey of Income and Living Conditions (SILC) carried out by the CSO asks households about the nature of occupancy. Microdata files from this survey allow us to examine the nature of occupancy by sector of employment. Figure 7 shows the distribution of households with a mortgage by the sector of employment of the survey reference person for 2007. Over 20 per cent of mortgages are held by those employed in financial services and nearly 15 per cent by those in other production industries.

QNHS microdata allow us to compare the distribution of employment to the distribution of mortgages. While financial and business services account for 12.5 per cent of employment it accounts for 21.1 per cent of mortgage holders. Similarly, public administration and defence, education, and health and social work each account for between 4-5 per cent of employment, but account for between 10-12.5 per cent of mortgages. In contrast, in the second quarter of 2007, just following the peak in house prices, construction accounted for nearly 20 per cent of employment but only 6.7 per cent of mortgages.

The QNHS shows the deterioration in the Irish labour market in recent times. There has been a large increase in unemployment, rising from below 5 per cent prior to the first quarter of 2008 to a rate of 10.2 per cent in Quarter 1, 2009. Table 5 shows the change in employment by sector between the first

Figure 7: *Proportion of Households Who Own their Homes with a Mortgage by Sector of Employment of the Head of Household**

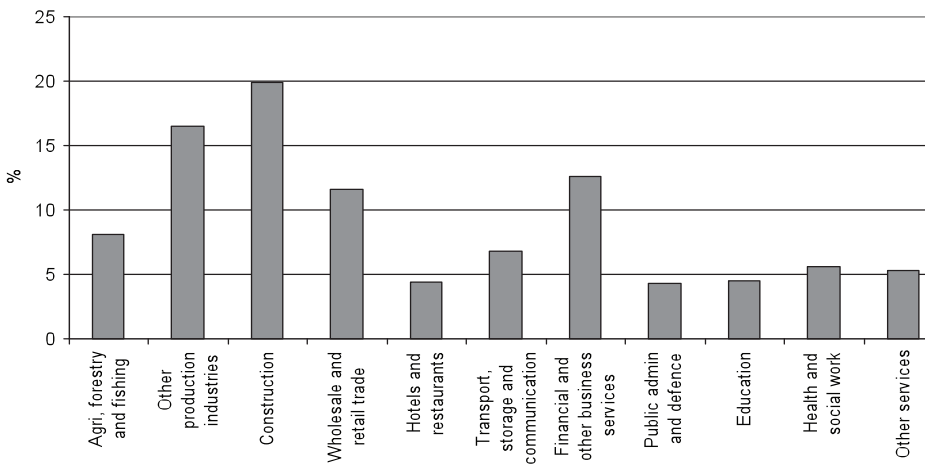


Note: *Where the PES of the head of household is 'at work'. Reference period is January 2006 to December 2007.

**Sample size too small.

Source: Estimate based on information from the Survey on Income and Living Conditions, CSO.

Figure 8: *Proportion of Households by Sector of Employment of the Head of Household**



Note: *Where the PES of the head of household is "at work". Reference period is Quarter 2, 2007.

Source: Estimates based on QNHS data.

quarter of 2007, when house prices peaked and the most recent data for the first quarter 2009. The largest falls in employment have been in construction (−31.3 per cent), other production industries (−11.4 per cent) and hotels and restaurants (−11.1 per cent). Those employed in these sectors are more vulnerable to the combination of negative equity and an income shock caused by job loss.

Table 5: *Employment by Sector, Annual Percentage Change*

	Q1 2008	Q1 2009	Q1 2007 to Q1 2009	Mortgages by Sector of Employment Percentage of Household Heads	Sector of Employment Percentage of Household Heads
	%	%	%		
Agriculture, forestry and fishing	8.9	−13.1	−5.4	—*	8.1
Other production industries	−4.5	−7.3	−11.4	13.9	16.5
Construction	−5.9	−27.1	−31.3	6.7	19.9
Wholesale and retail trade	7.2	−9.7	−3.2	9.5	11.6
Hotels and restaurants	−1.0	−10.2	−11.1	4.1	4.4
Transport, storage and communication	−1.1	0.9	−0.2	5.3	6.8
Financial and other business services	8.2	−5.6	2.1	21.1	12.6
Public administration and defence	1.6	3.6	5.2	12.5	4.3
Education	−2.1	6.1	3.9	10.7	4.5
Health and social work	5.0	1.4	6.5	11.4	5.6
Other services	4.0	−4.1	−0.3	4.2	5.3
	1.7	−7.5	−5.9		100.0

* Sample size too small.

Source: Based on QNHS data and EU-SILC data.

It may well be the case that Ireland does not experience defaults to the same extent as other economies. Unlike the situation for most of US borrowers, mortgage borrowers in most of Europe remain liable for the difference between the house value and the outstanding loan amount. Furthermore, Table 5 shows that many of those who have mortgages are

employed in sectors where employment prospects remain relatively robust. However, continued increases in unemployment spreading across more sectors would put pressure on the default rate.

VII PUBLIC POLICY AND NEGATIVE EQUITY

Generally, policies put in place by government or by lenders do not directly deal with negative equity but have had the goal of reducing the probability of default. These are usually either loan modification which puts in place a permanent change to the terms of the loan, possibly a lower interest rate or a reduction to the outstanding balance. Alternatively, the lender may agree to lower payments without changing the loan terms and the reduction in payments is added to the outstanding balance, forbearance policies. In the face of concerns about the rising number of households in negative equity the US government has launched the Making Home Affordable Program¹³ for borrowers through the Freddie Mac and Fannie Mae agencies. The Making Home Affordable Program offers two different potential solutions for borrowers: (1) refinancing mortgage loans, through the Home Affordable Refinance Program (HARP), and (2) modifying mortgage loans, through the Home Affordable Modification Program (HAMP).

Closer to home, during the trough of the UK housing market in early 1993, published estimates of households in negative equity were upwards of 1.5 million.¹⁴ The more recent slump in UK house prices has resulted in an estimated 900,000 in negative equity (Tatch, 2009). Budget 2009 (HM Treasury) announced the extension of a number of supports to those experiencing negative equity. These include the Mortgage Rescue Scheme and Mortgage Support Scheme for those who are vulnerable to financial difficulties or who have suffered income or employment loss. The Mortgage Rescue Scheme has two strands – an equity loan enabling mortgage repayments to be reduced, or alternatively the debt is cleared completely and the applicant pays rent at a level they can afford. The Mortgage Support Scheme defers some of borrowers' interest payments for up to two years, with the UK government guaranteeing a proportion of the deferred interest.

There has also been a private sector response to the difficulties negative equity creates for housing market mobility. The Nationwide Building Society in the UK launched a 125 per cent mortgage for existing customers who are experiencing negative equity and need to move house. Borrowers needing to

¹³ Full details are available at www.makinghomeaffordable.gov

¹⁴ Quoted in Tatch (2009). Cutler (1995) also examines negative equity in a UK context.

move can replace their existing mortgage with a new loan of up to 95 per cent of the value of the property. An additional loan of 25 per cent of the loss incurred from the existing property could be added on.¹⁵

In an Irish context, the Mortgage Interest Supplement scheme provides short-term support to help pay mortgage interest repayments. If eligible, assistance is provided with the interest portion of the mortgage repayments. There are currently over 14,100 people in receipt of mortgage interest supplement, an increase of 75 per cent, or 6,000, over the number in payment at the end of 2008.¹⁶ A new statutory Code of Conduct on Mortgage Arrears (Financial Regulator, February 2009), sets out some procedures for handling mortgage arrears such as deferral of payments, extending the mortgage term, changing the mortgage type, or capitalising the arrears and interest.

Foote, Gerardi, Goete and Willen (2009), using US data, model the decision to default. They find households that suffer income disruption are more likely to default and on this basis argue that policies may be effective in preventing default if they offer temporary assistance to borrowers, such as a two year payment sharing plan.¹⁷ This may be effective for those suffering a temporary disruption in income. However, it is more difficult to assist households suffering a permanent income shock. In this situation policies that would allow the borrower to remain in their home by changing their tenure to renting could be considered.

VIII CONCLUSIONS

This analysis estimates the number of mortgage borrowers in negative equity. A feature of the housing market boom was a large increase in the numbers borrowing for house purchase. The length of the house-price boom means that people who had entered the housing market in the late 1990s and early years of this decade are, to date, unaffected. The decline experienced in house prices to date, coupled with the anticipated decline in 2009 would essentially capture people who financed purchases between 2004 and 2008 and would push 116,000 borrowers into negative equity. The anticipated decline in prices in 2010 would take the number of borrowers up to 196,000 and include those who financed purchases in 2003 and 2009 with high LTVs. Although this represents a large number of households in absolute terms it is a small proportion of the stock of households in Ireland.

¹⁵ Nationwide Building Society Press Release, July 9, 2009.

¹⁶ Minister for Social and Family Affairs, Dail Debates, October 7, 2009.

¹⁷ See Foote, Fuhrer, Mausekopf and Willen (2009) for detail.

Estimating the numbers in negative equity indicates that higher LTVs, interest only mortgages and a longer mortgage term contributes to higher numbers exposed to negative equity. This is in common with Ellis (2008b). The analysis finds that those who borrowed at, or close to the peak, namely 2006 and 2007, with a high loan-to-value ratio are more likely to find themselves in negative equity. FTBs are also more likely to have a mortgage the value of which is higher than the house price. This in part reflects the use by FTBs of longer mortgage terms.

Negative equity can cause difficulties for households and for the macro-economy. However, US research has shown that negative equity does not cause default or foreclosure but rather is a condition of default. Foote *et al.* (2008) find that less than 10 per cent of US households that fall into negative equity default. It may well be the case that Ireland does not experience defaults to the same extent as other economies. The research shows that many of those who have mortgages are employed in sectors where employment prospects remain relatively robust.

International research has found that households that suffer the double effect of negative equity and an income shock are more likely to default. Policies that assist households overcome a loss in income may help lower the default rate.

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APPENDIX 1

Worked Example of Negative Equity Calculation

<i>First-Time Buyer</i>						
Drawdown	2004					
House price,	€221,381					
LTV	100%					
Loan,	€221,381					
Payment,	€11,006					
Term (years)	35					
Interest Rate	3.46%					
	<i>Balance</i>	<i>Interest</i>	<i>Principal paid</i>	<i>Balance (end year)</i>	<i>House price (end year)</i>	<i>Equity</i>
	€	€	€	€	€	€
2004	221,381	7,660	3,347	218,034	221,381	3,347
2005	218,034	7,544	3,462	214,572	249,499	34,927
2006	214,572	7,424	3,582	210,990	279,003	68,014
2007	210,990	7,300	3,706	207,283	260,786	53,502
2008	207,283	7,172	3,834	203,449	224,153	20,704
2009	203,449	7,039	3,967	199,482	195,013	-4,469
2010	199,482	6,902	4,104	195,378	169,661	-25,716

Note: House price is from *permanent tsb/ESRI House Price Index*, December each year.

Based on this estimation FTBs who drawdown their mortgage in 2004 with a 100 per cent LTV would be in negative equity by end-2009.

Based on DoEHLG data on loans and loan-to-value ratios this amounts to 2,014 FTBs.

(FTB loans in 2004 = 33,561, Proportion with 100 per cent LTV=6 per cent).