

Mortgage Arrears in the 1990s: Lessons for Today

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ABSTRACT

Mortgage lending growth in recent years has been high both by historical and international comparison. Recent anecdotal evidence suggests households are obtaining ever higher mortgage debt-to-income multiples, higher loan-to-value ratios and/or higher maturity loans. Many commentators have long been concerned that the criteria for determining the value of a mortgage – a combination of income multiples, property values and repayment burdens – may not adequately protect the household from falling into arrears because of an adverse income or interest rate shock. Indeed, simulations suggest that a modest rise in interest rates would result in a significant share of newly mortgaged households with substantial repayment burdens. The question arises as to whether mortgage holders at this point in time are more likely to fall into mortgage arrears by comparison with their peers in recent years. This question can be partially answered by understanding why households have fallen into mortgage arrears in the past. This paper uses household-level data to explore the reasons why households fell into mortgage arrears during the 1990s. Our analysis suggests that a household's mortgage repayment burden was a significant factor in increasing the probability a household would fall into arrears on their mortgage repayments during this time. Several other important and more significant factors by comparison with the repayment burden were also identified. The more significant of these factors were being unemployed (or experiencing a significant drop in household income), having other debt repayments and having other non-mortgage arrears. These conclusions suggest that the continuing strong growth in mortgage lending, to the extent that it may be partially caused by relaxed lending criteria and households accepting higher repayment burdens, and occurring against a background of rising unemployment, may lead to a higher rate of mortgage arrears among households.

1. Introduction

Many commentators have long been concerned that the criteria for determining the value of a mortgage – a combination of income multiples, property values and repayment burdens – may not adequately protect the household from falling into arrears because of an adverse income or interest rate shock.¹ Recent anecdotal evidence suggests households are obtaining higher mortgage debt-to-income multiples, higher loan-to-value ratios and/or higher maturity loans. The net result of the relaxed criteria is some new mortgage holders could have higher repayment burdens by comparison with their peers in the early 1990s – a surprising fact given mortgage rates are lower and incomes are higher by comparison with the early 1990s. Are households with relatively higher mortgage repayment burdens more likely to fall into arrears?

* The author is an economist in the Monetary Policy & Financial Stability Department. The views expressed in this paper are the personal responsibility of the author and are not necessarily held by the CBFSAI or by the ESCB. All remaining errors and omissions are the author's. The author would like to thank his colleagues within the CBFSAI for invaluable assistance in completing this paper.

¹ See the recent *Financial Stability Report* published by the CBFSAI.

Simulations suggest that a modest rise in interest rates would result in a significant share of newly mortgaged households with substantial repayment burdens. The main question addressed in this paper is why Irish households fell into mortgage arrears in the 1990s. This paper uses two household-level surveys with data on mortgage lending, income and mortgage arrears to examine the factors that determine whether households are more likely to fall into arrears and specifically whether the repayment burden is a significant factor? This question has gained added importance lately. First, the probability that repayment burdens can fall much further in the future must be doubtful given how low the cost of borrowing is already (by historical standards) and how disposable incomes might be expected to grow at a slower rate as a consequence of slower GDP growth generally. Second, the salary multiple as the main determinant of the maximum allowable mortgage is in some cases being replaced by the percentage of an applicant's income that is spent on mortgage repayments. The various mortgage lending institutions would under this criteria have to decide to lend a mortgage amount such that the repayment did not exceed a maximum share of income (for example, the repayments might not exceed 40 per cent of income).

The 1990s is a very relevant period during which to study the reasons that explain why households fell into mortgage arrears. Descriptive statistics using household-level data show that mortgage debt-to-income ratios for new mortgage applicants rose during the last decade. The net result was that a substantial number of new mortgage applicants in the late 1990s, despite beginning their mortgage repayments at a time of lower interest rates and higher employment rates, had higher repayment burdens by comparison with their peers in the early 1990s. Analysis for the mid-1990s suggests this was problematic for some of these heavily mortgaged households because a household's mortgage repayment burden was a significant factor in increasing the probability a household would fall into arrears on their mortgage payments during this time. However, several other more important factors in increasing a households' probability of falling into arrears were also identified. The more significant of these factors were being unemployed (or experiencing a significant drop in household income), having other debt repayments, having other non-mortgage arrears and not saving regularly. These conclusions suggest that the continuing strong growth in mortgage lending, to the extent that it may be partially caused by relaxed lending criteria and households accepting higher repayment burdens, and occurring against a background of rising unemployment, may lead to a higher rate of mortgage arrears among households.

The paper is organised as follows. Section 2 presents descriptive statistics on current mortgage lending growth and summarises the results of simulations of how the current repayment burden in mortgaged households would change if variable interest rates rose in the future. Section 3 provides background information on

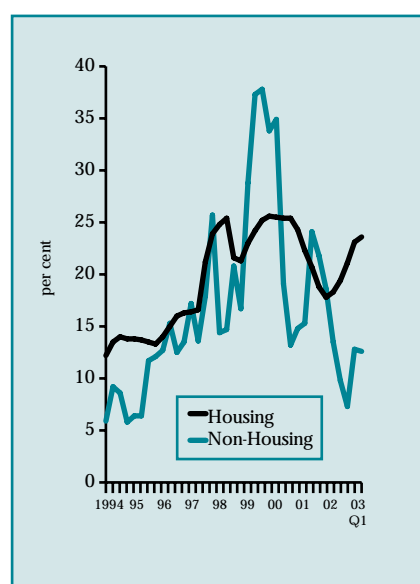
mortgage debt-to-income ratios and arrears data for the 1990s. Section 4 presents a descriptive analysis of the rates of arrears among households with different mortgage, financial and social characteristics. Section 5 contains a summary and some conclusions.

2. Mortgage Lending and Repayment Burdens

2.1 Current Mortgage Lending Growth

Mortgage lending growth in recent years has been high both by historical standards and by international comparison. Chart A shows growth in the value of outstanding housing finance has exceeded 15 per cent in each year since 1997 and has been above 20 per cent for much of this time. These rates exceeded the 12 to 15 per cent growth rates of the early 1990s. These growth rates in housing finance have placed Ireland in an intermediate ranking by growth rates *vis-à-vis* other countries. The value of outstanding housing finance in Ireland by end-2000 was 2½ times its 1995 level. This rate of growth was well above the growth in France (1.3 times), Germany (1.4 times) and Belgium (1.6 times) but below the rate in Greece (3.1 times) and Portugal (3.4 times).

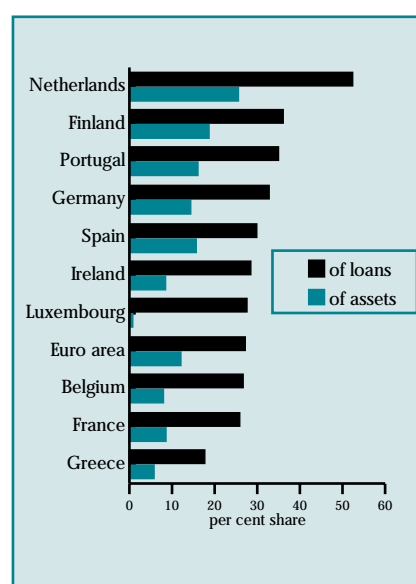
Chart A: Housing and Non-Housing Credit^a, Annual % Changes



Source: CBFSAL.

^a Housing credit includes securitisations. Non-housing credit is finance for investment and other personal credit.

Chart B: The Importance of Mortgage Lending across Countries^a



Source: ECB (2002) Report on Financial Structures.

^a Calculated as the value of mortgage lending to (i) value of credit institutions assets and (ii) total value of loans to the private sector. Data as at end-2000.

This high growth rate of housing finance has increased the importance of housing finance in the Irish banking system. The value of housing finance was equivalent to 33.7 per cent of all loans to the non-financial private sector at end-1997 and this share had increased to 43.2 per cent by end-2002 (although the

value of housing finance to the value of total assets remained broadly unchanged at approximately 23 per cent of assets).² Ireland now holds an intermediate position in an international ranking of banking systems by the share of their loan portfolio and assets devoted to housing finance. These shares were 28.1 per cent and 8.5 per cent, respectively, at end-2000 (Chart B).³ In the Netherlands, the ratio of housing finance to private sector loans and credit institutions' assets is nearly double and three times the Irish ratios, respectively. In this context, the recent high growth in mortgage lending could be interpreted as Ireland converging to the average level of mortgage financing in various EU banking systems.

2.2 The Simulated Impact of any Future Increases in Interest Rates

Recent anecdotal evidence suggests households are obtaining ever higher mortgage debt-to-income multiples, higher loan-to-value ratios and/or higher maturity loans. Many commentators have long been concerned that the criteria for determining the value of a mortgage – a combination of income multiples, property values and repayment burdens – may not adequately protect the household from falling into arrears because of an adverse income or interest rate shock. An adverse shock to income or an unanticipated large increase in interest rates will increase a household's mortgage repayment burden.

Simulations suggest that a modest rise in interest rates would result in a significant share of newly mortgaged households with substantial repayment burdens. The distribution of mortgage repayment burdens across mortgaged households⁴ can be calculated from household-level data only because a household's mortgage payment needs to be benchmarked against its income. The latest comprehensive household-level data available from which we can calculate repayment burdens across a weighted

² These data are sourced from the CBFSAI's quarterly bulletins (Table C3). The figures relate to all credit institutions and measure loans and assets *vis-à-vis* residents only.

³ These figures are not directly comparable to the estimates of the importance of housing finance documented earlier in the paragraph. These figures benchmark housing finance to the total value of all assets and loans for all credit institutions within each country *vis-à-vis* both residents and non-residents.

⁴ A distribution is just a means of presenting a range of values of any variable, the mortgage repayment burden in this example, across a large number of observations (households in this example). The distribution is calculated by ranking households by their repayment burdens from the household with the lowest value to the highest value. We then count down a certain percentage of the number of households (for example, 20 per cent) and ask what is the value of the repayment burden for the household that is 20 per cent of the way down the ranked list of households (i.e. this is also called the value of the repayment burden at the 20th percentile). When the value of the repayment burden is known at this point, two further facts can be stated. First, it can be stated that 20 per cent of households have a value of repayment burden less than this value (because the list of households was ranked originally from the lowest to the highest by their repayment burdens). Secondly, 80 per cent of households, i.e. the rest of the ranked list, have a repayment burden greater than this value. The typical percentiles used throughout the rest of this paper are the 20th, 40th, 50th, 60th, 80th and 90th. We calculate these additional percentiles (i.e. 40th, 60th etc) in the exact same manner by counting the appropriate percentage of households down the ranked list (i.e. 40 or 60 per cent of the way down the ranked list) and asking what is the value of the repayment burden at that point.

sample of households is the CSO's Household Budget Survey undertaken in 1999/2000. The data in Table A shows that, if it is assumed that the mortgage debt-to-income ratios have stayed the same for both existing and new mortgaged households, then repayment burdens will have fallen further since 1999/00 because interest rates have fallen further.

Table A: The Impact of Various Interest Rate Increases on the Distribution of Repayment Burdens across all and Newly Mortgaged Households

Mortgage Repayment Burdens (i.e., the ratio of mortgage payments to income (%))								
Distribution	All mortgage holders				New mortgage holders			
	1999/00	2003+	+2pps	+4pps	1999/00	2003	+2pps	+4pps
20 th	7.1	6.3	7.9	9.6	13.1	10.3	15.1	19.0
40 th	10.6	9.2	12.0	14.6	16.9	15.2	21.4	27.1
Median (50 th)	12.4	10.7	13.9	17.1	18.5	16.2	23.6	29.9
60 th	14.3	12.2	16.3	20.4	20.5	17.4	25.6	32.9
80 th	19.9	17.2	23.1	28.9	29.3	26.6	32.4	42.1
90 th	25.6	22.6	29.5	37.0	37.4	34.3	42.5	55.0

Source: CSO's Household Budget Surveys and author's calculations.

Note: See footnote 4 for a fuller explanation of how to interpret the distribution of any variable. The 20th percentile shows that 20 per cent of all households had a repayment burden in 1999/00 of 7.1 per cent or less or alternatively, that 80 per cent of households had a burden greater than 7.1 per cent. The 40th percentile shows that 40 per cent of new mortgage holders had a repayment burden of 16.9 per cent or less or alternatively that 60 per cent of the group had a burden of at least 16.9 per cent. Each of the other points on the distribution (50th, 60th, 80th and 90th) should be interpreted in a similar fashion.

Household income is measured as the sum of both the chief economic supporters and spouse's disposable income. We have calculated the share of each mortgaged household's mortgage repayment into an interest and principal repayment using the average mortgage rate prevailing in the quarter the household was surveyed in 1999 and 2000. The following average mortgage rates prevailed at the time: 1999 Q2 5.2%, 1999 Q3 4.8%, 1999 Q4 4.0%, 2000 Q1 4.2%, 2000 Q2 4.7%, 2000 Q3 5.3%). To obtain the current repayment burden, we have assumed that all households are paying the average variable rate of 3.5%. This rate has been subsequently increased by either 2 or 4 pps; the new interest payment was recalculated and added to the original principal repayment to obtain the new mortgage payment. The new mortgage payment was then calculated as a proportion of income.

Repayment burdens, however, would rise further in the event interest rates rose to the levels prevailing in the early 1990s or earlier. Table A shows our forecasts of the distribution of repayment burdens across households in the event interest rates rise by 2pps or 4pps from their present levels.⁵ These estimations have been presented for all mortgage holders and new mortgage holders. A two percentage point rise in mortgage rates would raise the income gearing of the median mortgaged household by over 3 percentage points to 13.9 per cent. At this new rate, 90 per cent of all mortgaged households would be paying 29.5 per cent or less of their incomes on their mortgage repayment burdens (or alternatively that 10 per cent of mortgaged households would be paying at least 29.5 per cent of their incomes on their mortgages). The magnitude of these changes for the median household is reflected at all points on the distribution.

⁵ This does not account for the buoyant economic growth and falling unemployment that would most likely accompany an upward trend in interest rates.

A rise in mortgage rates would have greater consequences for new mortgage holders by comparison with all mortgage holders. This is explained by the fact illustrated in Table A that new mortgaged households have higher repayment burdens currently by comparison with all mortgaged households. However, a 2 pp rise in the current level of interest rates would see the typical newly mortgaged households income gearing rise from 16.2 to 23.6 per cent and at least 10 per cent of new mortgage holders would be paying at a minimum 42.5 per cent of their incomes on mortgage repayment burdens at this new mortgage rate. There would almost certainly be a substantial repayment burden on a significant number of newly mortgaged households if interest rates rose by 4 pps from present levels. The typical new mortgage holder would be paying 29.9 per cent of their incomes on their repayments. Perhaps most worrying is the fact that 20 per cent of this group of households would be paying at least 42.1 per cent of their incomes and 10 per cent of newly mortgaged households would end up repaying at least 55 per cent of their incomes. It might be suggested a significant fraction of these households would fall into arrears with such significantly high debt service costs. Furthermore, the risk of these most-at-risk households would be exacerbated if they shared many of those characteristics, to be highlighted in Section 4, that predispose households to have a greater risk of falling into arrears.

3. Mortgage Lending, Repayment Burdens and Mortgage Arrears in the 1990s

3.1 Explaining Mortgage Lending Growth in the 1990s

Many commentators have been concerned for some time that mortgage lending has been rising for the worrying reason that new mortgage applicants have been able to secure a higher value of mortgage debt relative to their income than was possible in previous years. However, the aggregate mortgage lending statistics do not offer any insight as to whether the recent increase in the outstanding stock of mortgage lending is the result of

- i) mortgage applicants obtaining higher debt-to-income ratios;
- ii) a substantial increase in the number of mortgage applicants; or
- iii) a combination of both of these developments.

The following analysis shows the growth in mortgage lending during the latter half of the 1990s was a product of an increasing number of new mortgaged households as well as increasing mortgage debt-to-income ratios.

The gross increase (i.e., not taking repayments of existing mortgages into account) in the value of mortgage loans

outstanding between two dates in time is the product of the number of mortgages issued multiplied by the average value of those mortgages. The total number of mortgages outstanding grew very significantly during the 1990s. The household survey suggests there were approximately 226,776 households (21.8% of all households) with mortgages at banks and building societies.⁶ This total had increased by 41.5 per cent to 321,041 households by the year 2000 when approximately 26.1 per cent of all private households had a mortgage outstanding from a bank or building society.⁷

The increase, however, in the number of outstanding mortgages cannot by itself explain the approximately €18 billion rise in mortgage loans outstanding over this period. The median new mortgage issued in 1994 was approximately €80,000 and multiplying this value by the increased number of mortgages gives a figure of €7.5 billion. The only explanation for the €10.5 billion shortfall is that the typical value of a new mortgage has increased between 1994 and 2000. This does appear to be the case because the median value of a new mortgage issued in 2000 was approximately €133,000 (a 66 per cent nominal increase over the 1994 value).

The increase in the median value of a new mortgage issued is explained largely by the willingness of the credit institutions⁸ to issue a greater value of mortgage for a given household income.⁹ New mortgage applicants in 2000 were obtaining higher debt-to-income ratios from the credit institutions. The data on mortgage debt-to-household-income ratios in Table B supports this explanation. The median new mortgage applicant accepted a mortgage value equivalent to 1.3 times gross household employment income. This value had increased to 2.0 times by 2000. The top 10 per cent of new mortgage applicants in 1994

6 This excludes households with mortgages outstanding from other sources such as local authorities or insurance companies.

7 Part of the explanation of this increase in the number of mortgages could be explained principally by the historic rise in population which became evident in the mid-1990s and continued for many years. The latest census results (www.cso.ie) shows that the population has grown by over 8 per cent since 1996 – the second highest increase since 1926. However, whereas the 13 per cent increase recorded in the 1970s occurred through a natural increase (i.e. the increase in the population was mainly of children), the recent increase has been through inward migration (i.e. many people of working age) which explains over half the increase in population. Many of these migrants will have demand for loans including mortgages.

8 There are substantial gaps in our information on these mortgages to judge whether the willingness of the credit institutions to offer these higher debt-to-income ratios was a sound decision from a financial stability perspective or from each households' perspective. For example, we do not know the loan-to-value ratio for each mortgage.

9 Household disposable income includes net earned income plus income from other sources for both the household's chief economic supporter and their spouse. The CSO issue a health warning about the income data for the household budget survey. They have reason to believe households have a propensity to underestimate some categories of their income. However, the focus here is on comparing the ratio of the typical new mortgage value to the typical income in both 1994 and 2000. Therefore, this issue with the income data may overestimate the debt-to-income ratio in both 1994 and 2000 but the proportional change in the ratio between both dates should be reliable and informative.

had a debt-to-income ratio of at least 2.6 times. This share had increased considerably by the year 2000 where 20 per cent of households (i.e., the 80th percentile) had a debt-to-income ratio in excess of 2.9 times. More worryingly from a financial stability perspective was that 10 per cent of new mortgage holders had a debt-to-income ratio of at least 4 times gross employment income. Table B also includes the debt-to-income ratios calculated on a disposable income basis. Household disposable income is net of income taxes but also includes income from non-employment sources. The same pattern emerges from analysing these data. The debt-to-disposable income ratios had increased considerably since 1994 and at least 10 per cent of new mortgage holders in 2000 had a debt-to-disposable income ratio of at least 4.9 times.

Table B: Distribution of Mortgage Debt-to-Income Ratios for New Mortgage Holders

Denominator	Debt to income ratio:			
	Household gross employment income		Household disposable income	
	1994/95	1999/2000	1994/95	1999/2000
Distribution				
20 th	0.8	1.4	1.1	1.4
40 th	1.2	1.8	1.5	2.0
Median (50 th)	1.3	2.0	1.8	2.3
60 th	1.6	2.2	2.0	2.5
80 th	2.2	2.9	2.5	3.3
90 th	2.6	4.0	3.0	4.9

Source: CSO's Household Budget Surveys and author's calculations.

Note: The 20th percentile shows that 20 per cent of households had an outstanding mortgage debt to income ratio of 0.8 times or less or alternatively, that 80 per cent of households had ratio greater than 0.8 times. The 40th percentile shows that 40 per cent of new mortgage holders had a debt-to-gross-income ratio of 1.2 or less or alternatively that 60 per cent of the group had at least a ratio of 1.2. Each of the other points on the distribution (50th, 60th, 80th and 90th) should be interpreted in a similar fashion.

Income is measured as the sum of both the chief economic supporters and spouses' income. Disposable income is net of income taxes but includes all income from non-employment sources.

New mortgage holders are mortgage holders who have lived in their residence for one year or less.

These data are based on 99 observations (unweighted) in 1994/95 survey and 152 (unweighted) in the 99/00 survey.

3.2 Mortgage Repayment Burdens

It can be argued that higher debt-to-income ratios did not automatically lead to higher repayment burdens for these households. This argument relies principally on the reductions in mortgage interest rates that started in the early 1990s and have continued into 2003. In the interim period since 1994/95 the average mortgage variable interest rate fell from approximately 7 to 7.5 per cent to about 5 per cent by 1999/2000.

The disaggregated data show that repayment burdens for a significant share of new mortgage holders in 1999/2000, despite the reductions in mortgage rates, were greater than the corresponding burdens when measured in 1994/1995. Table C

shows the distribution of income gearing¹⁰ across all and new mortgage holders for each survey. There is certainly evidence that income-gearing levels had fallen between both surveys for *all* mortgage holders. For example, the median mortgaged household saw their repayment burden fall from 15.1 per cent of income to 12.4 per cent. But some *new* mortgage holders were taking on higher repayment burdens in 1999/2000 by comparison with their peers in the 1994 survey. It is true the income gearing of the median household fell between both surveys, but the top 10 per cent of households ranked by repayment burden reported gearing ratios in excess of 37 per cent in 1999 (the gearing ratio of their peers was 32.4 per cent in 1994).

Table C: Distribution of Repayment Burdens for Mortgage Holders

Distribution	Income-gearing ratio (%):			
	All mortgage holders		New mortgage holders	
	1994/95	1999/00	1994/95	1999/00
20 th	9.1	7.1	15.5	13.1
40 th	12.9	10.6	18.3	16.9
Median (50 th)	15.1	12.4	20.3	18.5
60 th	16.9	14.3	22.7	20.5
80 th	22.8	19.9	27.9	29.3
90 th	28.8	25.6	32.4	37.4

Source: CSO's Household Budget Surveys and author's calculations.

Note: Income is measured as the sum of both the chief economic supporters and spouse's disposable income.

The 20th percentile shows that 20 per cent of households had an income-gearing ratio of 9.1 per cent or less or alternatively, that 80 per cent of households had an income-gearing ratio of greater than 9.1 per cent.

We cannot explicitly identify first time buyers. Therefore these calculations are for mortgage holders who have lived in their residence (i.e., new mortgage holders) for approximately one year.

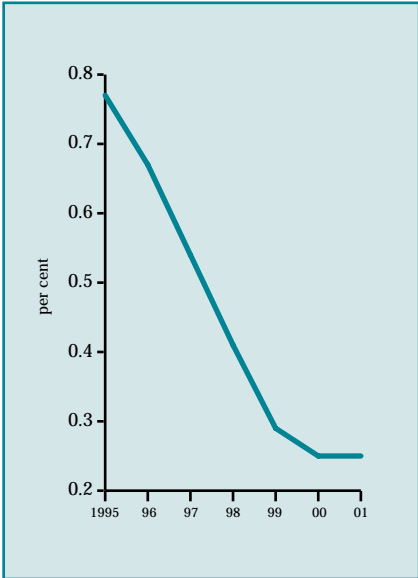
3.3 Mortgage Arrears

Mortgage arrears fell in the latter half of the 1990s. There are two sources of data on arrears for this period and both data series confirm this downward trend. Aggregate statistics on the value of mortgages outstanding in arrears, provided by a subset of mortgage lenders, shows arrears fell substantially between 1995 and 2001 (Chart C). An alternative series of household level data¹¹ gives some indication of how many mortgaged households were in arrears (i.e. unable to pay scheduled mortgage payments) during these years (Chart D). These data show that 9.3 per cent of mortgaged households were in arrears in 1994 but that this number had fallen to 4.7 per cent in 1997 before climbing once again to 5 per cent in 1998.

¹⁰ Income gearing is an alternative expression for a ratio of mortgage payments to income or the repayment burden.

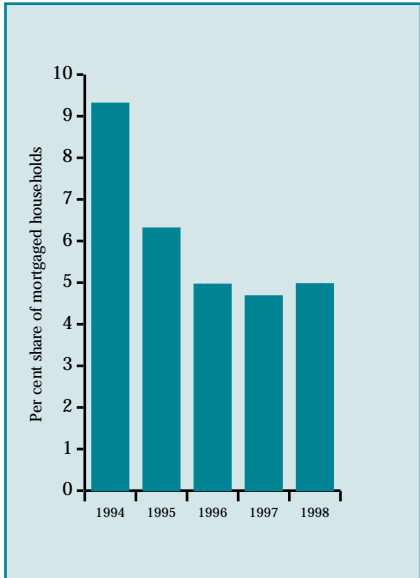
¹¹ Two sources of household level survey data are used throughout this paper. The first is the CSO's Household budget survey completed in 1994/1995 and 1999/2000. The second dataset is Eurostat's European Community Household Survey (ECHP) dataset completed annually between 1994-1998 inclusive. The datasets are explained in more detail in the data appendix at the end of the paper.

Chart C: Total Value of Arrears at Year End (as a % of Total Portfolio)



Source: Irish Mortgage and Savings Association.
Data is provided by Permanent TSB, First Active, EBS Building Society, Irish Nationwide Building Society, ICS Building Society and IIB Homeloans Ltd.
Note: Data is an aggregate of both commercial and residential mortgages.

Chart D: Share of Mortgaged Households in Arrears



Source: Eurostat ECHP Surveys and author's calculations.

Is there any basis to commentators' concerns of a link between high repayment burdens and a higher propensity to be in arrears? The data in Table D show that the median household in arrears had a higher income-gearing level (20.1 per cent) as opposed to the median non-arrears mortgaged household (17.5 per cent). In general, the values of the distribution of income gearing across mortgaged households in arrears were greater by comparison with non-arrears households. But there were also a significant number of non-arrears households with high levels of repayment burdens and which avoided going into arrears. For example, 10 per cent of non-arrears households had repayment burdens greater than 51 per cent of their incomes. Furthermore, there were many households with small repayment burdens who were also in arrears. Table D shows some 20 per cent of households in arrears had a repayment burden of 10.4 per cent or less of their incomes. Again, this suggests that factors other than the repayment burden played a significant role in pushing these households into arrears. We explore the role of these factors in the next section.

Table D: Distribution of Repayment Burdens for Households in/not in Arrears

	Income-gearing ratios (%):	
	In arrears	Not in arrears
Distribution		
20 th	10.4	8.9
40 th	17.3	14.5
Median (50 th)	20.1	17.5
60 th	23.1	20.3
80 th	36.0	30.7
90 th	72.0	51.0

Source: Eurostat ECHP Surveys and author's Calculations.

Note: These income-gearing levels are gross of tax relief. Therefore these figures are not directly comparable to earlier estimates of income gearing from HBS survey that are net of tax relief.

4. What Factors Determine Mortgage Arrears?

A household's mortgage, financial and social characteristics will affect its probability of falling into arrears on that mortgage. Many of these characteristics have a straightforward and common sense impact on the likelihood of falling into arrears. Each of the main factors is discussed in turn below. Household-level data are used on the mortgage, financial and social characteristics of a sample of households that fell into mortgage arrears in the period 1994 and 1998.¹² These data allow us to describe the characteristics of those households in the year immediately prior to the year they fell into arrears. The data identifies subsets of households, grouped by a common mortgage, financial or social characteristic, with a higher rate of arrears than the typical household. Approximately 2.5 per cent of all mortgaged households fell into arrears in the following year. A rate of arrears greater than 2.5 per cent for any subset of households, reported in the tables below, should be interpreted as suggesting that this characteristic raises the probability that households with this characteristic would fall into arrears. This historical analysis may offer some guidance on the significant factors pushing households into mortgage arrears in the near future. Each of the factors is considered in turn.

4.1 Mortgage Repayment Burden

The mortgage repayment burden of the household is calculated as the monthly mortgage repayment (gross of tax relief) divided by the monthly value of net household income (i.e., the sum of after-tax employment earnings plus any other income from

¹² The sample is approximately 3 per cent of all households surveyed in this period. This sample of households may not be the population of households that fell into arrears during this period. The criterion for being included in the sample is that the household was surveyed in two consecutive years and that the household was not in arrears in the first year but fell into arrears in the second year. Thus households that were not surveyed in two consecutive years may have been excluded. Approximately 6.8 per cent of households were in arrears at some point in time during this period. Approximately half of all mortgaged households in arrears were in arrears in consecutive years and therefore were excluded from the analysis also.

investments or social welfare transfers). The probability of falling into arrears can be expected to increase with the level of income gearing. This expectation is based primarily on the idea that households with relatively higher income gearing are more vulnerable to a rise in interest rates or a fall in their income. The data in Table E¹³ suggest that there is some evidence to support our expectations. In the following year 2.8 per cent of households with repayment burdens in excess of 30 per cent fell into arrears. The corresponding rate of arrears among households with the lowest repayment burdens was 2.1 per cent. However, the relationship between income gearing and the rate of arrears for the intermediate categories of gearing is not linear.

Table E: Rate of Arrears among Households by Repayment Burden^a

	% households falling into arrears
Repayment burden (levels):	
Income gearing 0-10%	2.1
Income gearing 10-20%	2.6
Income gearing 20-30%	2.4
Income gearing 30%+	2.8
All households	2.5

^a Calculated as the percentage of all households (weighted), classified into five categories of income gearing, that were not in arrears but that subsequently fell into arrears in the following year. The unweighted sample size is 113 households falling into arrears out of a population of 4,132 households. The category with the lowest number of observations (unweighted) is the 20-30% category with 788 households.

4.2 A New Mortgage

Relatively new mortgage holders can be expected to have higher rates of arrears because the financial cost of a mortgage will be greatest in its earliest years and because these households may be quite inexperienced in managing a large debt in adverse financial circumstances. However, the data in Table F do not suggest unequivocally that new households (1-5 years) have a higher rate of arrears by comparison with their immediate predecessors (6-10 years), but only by comparison with the 11+ years category.

Table F: Rate of Arrears among Households by Age of Mortgage^a

	% households falling into arrears
New or established mortgage:	
Age of mortgage 1-5 years	2.6
Age of mortgage 6-10 years	2.9
Age of mortgage 11+ years	2.3
All households	2.5

^a Calculated as the percentage of all households, classified into three categories of age, that were not in arrears but that subsequently fell into arrears in the following year. The unweighted sample size is 111 households falling into arrears out of a population of 4,061 households. The category with the lowest number of unweighted observations is 1-5 years category with 946 observations. We cannot explicitly identify when the mortgage was issued and therefore we proxy the age of the mortgage by identifying what year the household moved into the mortgaged property.

13 Tables E to L are sourced from Eurostat ECHP surveys and author's calculations.

4.3 Employment Status

The employment status of the chief economic supporter in the household may be important in determining the likelihood that a mortgaged household will experience an adverse shock from unemployment. The variable classifies households according to whether they are salaried employees, unemployed but looking for work or economically inactive. The employed categories are further subdivided by the skill level of the job. The four categories are professional/ managerial, skilled manual, semi-skilled manual and elementary occupations. Unemployment can be expected to increase the probability of falling into arrears because this may be an indicator that the household has already experienced an adverse income shock.¹⁴ Finally, it may be that the probability of arrears is higher for lower skilled workers because they have less job security. The data in Table G suggest that there is a wide divergence in the rate of falling into arrears between households classified by employment status and skill level. An un-skilled manual worker is seven times more likely to fall into arrears by comparison with a professional household. Having an unemployed head of household increases the risk of falling into arrears even further. Over 10 per cent of such households will fall into arrears in the next year.¹⁵

Table G: Rate of Arrears among Households by Employment Status^a

	% households falling into arrears
Work Status and Skill Level:	
Employed Professional/Managerial	1.3
Employed Skilled Manual	2.6
Employed Semi-skilled Manual	3.6
Employed Un-skilled Manual	9.1
Unemployed	10.5
Inactive	2.4
All households	2.5

^a Calculated as the percentage of all households, classified by the employment status of the head of household (itself defined as the person accounting for the majority of household income), that were not in arrears but that subsequently fell into arrears in the following year. The unweighted sample size is 110 households falling into arrears out of a population of 2,828 households. The unemployed category has the lowest number (80) of unweighted observations.

4.4 Changing Incomes

The probability of being in arrears can be expected to be relatively higher if income has fallen significantly since last year. An adverse income shock, such as unemployment, will force the household to rely on savings and cutbacks in expenditure to avoid falling into arrears. The data in Table H suggest that a

¹⁴ This expectation assumes implicitly that the household does not have a higher household income from welfare assistance by comparison with the value of earned income from employment.

¹⁵ It is not possible to identify whether the head of household has been made recently unemployed or has been unemployed for some time.

household with deteriorating incomes is over four times more likely to fall into arrears by comparison with a household which has experienced an improvement in income between both years.

Table H: Rate of Arrears among Households by Income Shocks^a

	% households falling into arrears
Income situation compared to previous year:	
Improved	1.6
Stayed same	2.4
Deteriorated	6.9
All households	2.5

^a Calculated as the percentage of all households, classified into those with improved, unchanged and decreased incomes, that are in arrears now having not been in arrears in the previous year. The unweighted sample size is 112 households falling into arrears out of a population of 4,033 households. The category with the lowest number of unweighted observations (737) is the deteriorated category.

4.5 Regular Savers

A propensity to save (defined here as normally having some income left over after living expenses that subsequently can be saved) reduces the probability of falling into arrears because the household can call upon these savings should the household face an unexpected adverse income shock. The data in Table I suggest that non-regular savers are five times more likely to fall into arrears in the subsequent year by comparison with households that normally have money left over after expenses that can then be saved.

Table I: Rate of Arrears among Households by Savings Behaviour^a

	% households falling into arrears
Household's propensity to save:	
Regular savers	0.7
Not regular savers	3.9
All households	2.5

^a Calculated as the percentage of all households, classified into savers and non-savers, that were not in arrears but that subsequently fell into arrears in the following year. The unweighted sample size is 109 households falling into arrears out of a population of 4,051 households. The category with the lowest number of unweighted observations (1730) is the non-savers category. This is based on the question "Is there normally some money left to save?" Data on the stock of savings of each household are not available.

4.6 Source of Income

Households differ in terms of their share of income which is sourced from wages and salaries as opposed to other private income, such as investment income, or social welfare transfers. The probability of falling into arrears is expected to fall with the share of employment income of total income. It is suggested that salaried income may be less volatile by comparison with investment income. The data in Table J suggest that households where a majority of the income is from non-salaried sources are more likely to fall into arrears.

Table J: Rate of Arrears among Households by Source of Income^a

	% households falling into arrears
Diversified sources of income:	
Wage income majority	2.3
Non-wage income majority	3.1
All Households	2.5

^a Calculated as the percentage of all households, classified by main source of income (i.e., greater than 50 per cent of income from a salaried or non-salaried source in the year prior to the survey), that were not in arrears but that subsequently fell into arrears in the following year. The unweighted sample size is 112 households falling into arrears out of a population of 4,153 households. The category with the lowest number of unweighted observations (1047) is the non-wage majority category.

4.7 Other Financial Commitments

Having additional non-mortgage debts or being in arrears on other payments may be a significant factor in pushing a household into mortgage arrears. A household with other compulsory repayments to make out of monthly income is less able to weather a substantial fall in income without having to renege on repayment of some of these commitments. The data in Table K suggest that there is a higher rate of arrears among households with other debts to repay (2.9%) by comparison with other non-mortgage indebted households (2.1%). However, a household where the non-mortgage debts are proving to be a burden, or where the household is in arrears on utility bills, are approximately three times more likely to be in arrears on their mortgage in the following year.

Table K: Rate of Arrears among Households by Propensity to have Other Debts^a

	% households falling into arrears
Other financial repayments:	
Repaying other debts	2.9
Not repaying other debts	2.1
Other financial repayments are a burden:	
In arrears on repayments of other debts	8.8
Not in arrears on repayments of other debts	2.4
Experiencing arrears on utility bills:	
In arrears on scheduled utility bills	7.2
Not in arrears on scheduled utility bills	2.3
All households	2.5

^a Calculated as the percentage of all households, classified by propensity to have other debts, to have trouble servicing other debts or to have trouble paying utility bills, that were not in arrears but that subsequently fell into arrears in the following year. The unweighted sample size is 113 households falling into arrears out of a population of 4,176 households. The respective categories with the lowest number of unweighted observations are as follows: repaying other debts (1864), have problems repaying other debts (89) and in arrears on utility bills (155).

4.8 Family Composition

The current stage of the household's life-cycle may affect a household's likelihood of falling into arrears. The probability of falling into arrears is likely to be higher for households with

dependents because they have higher compulsory expenses to be met out of income each month by comparison with a household with no dependents. The data in Table L suggest that other households (for example, single parent families or households supporting more than three children, etc) are over five times more likely to fall into arrears by comparison with households with no dependents.

Table L: Rate of Arrears among Households by Family Composition^a

	% households falling into arrears
Family Composition:	
Single/Double adult household (no dependents)	0.7
Double adult household (1,2,3 children <16 yrs)	2.6
All other households	3.8
All Households	2.5

^a Calculated as the percentage of all households, classified by family composition, that were not in arrears but that subsequently fell into arrears in the following year. The unweighted sample size is 113 households) falling into arrears out of a population of 4,176 households. The category with the lowest number of observations (757) is the 'no dependents' category.

5. Conclusions

Mortgage lending growth in recent years has been high both by historical and international comparison. Recent anecdotal evidence suggests households are obtaining ever higher mortgage debt-to-income multiples, higher loan-to-value ratios and/or higher maturity loans. Many commentators have long been concerned that the criteria for determining the value of a mortgage – a combination of income multiples, property values and repayment burdens – may not adequately protect the household from falling into arrears because of an adverse income or interest rate shock. Indeed, simulations suggest that a modest rise in interest rates wold result in a significant share of newly mortgaged households with substantial repayment burdens.

This paper explores whether Irish households with relatively higher repayment burdens during the 1990s were relatively more likely to go into mortgage arrears during that time. This paper uses two household-level surveys with data on mortgage lending, income and mortgage arrears to examine the factors that determine whether households are more likely to fall into arrears and specifically whether the repayment burden is a significant factor?

Analysis for the mid-1990s suggests that a household’s mortgage repayment burden was a significant factor in increasing the probability that a household would fall into arrears on its mortgage payments during this time. Several other and relatively more important factors in increasing a household’s probability of falling into arrears were also identified. The more significant of these factors were unemployment (or experiencing a significant

drop in household income), having other debt repayments and having other non-mortgage arrears.

These conclusions suggest that the continuing strong growth in mortgage lending, to the extent that it may be partially caused by relaxed lending criteria and households accepting higher repayment burdens, and occurring against a background of rising unemployment, may lead to a higher rate of mortgage arrears among households.

DATA APPENDIX

There are two household-level datasets used in the analysis presented in this paper. Both of these datasets were sourced from the Irish Social Science Data Archive (www.issda.ie).

The European Community Household Panel Survey (ECHP) by Eurostat

The ECHP is a household-level survey, collected by Eurostat, and is designed to compare social statistics across European countries on income, labour, poverty, social exclusion, health and living conditions in general. The Irish component of this database includes questions on mortgage repayment burdens and mortgage arrears. Each household has a weight so that results may be weighted to reflect the population of all households. The major drawback of this database is the lack of data on the value of mortgages outstanding in each household. Therefore, this database needs to be supplemented with another Irish household-level database with information on the mortgages outstanding in individual households. The data in this paper covers the period 1994 to 1998 inclusive.

The Household Budget Surveys (HBS) by the CSO

The HBS, completed in 1994/95 and again in 1999/00, are household-level surveys collected by the CSO. In similar fashion to the ECHP, the household-level data provides a snapshot of income and expenditure of Irish households at a point in time. Each household has a weight so that results may be weighted to reflect the population of all households. The crucial data provided by the HBS for this study are a value of the mortgage outstanding in each household as well as information on the type of mortgage. The repayment burden is calculated from these various sources of information. The major omission from this data is information on mortgages issued for investment properties. A further omission is any information on mortgage arrears.