

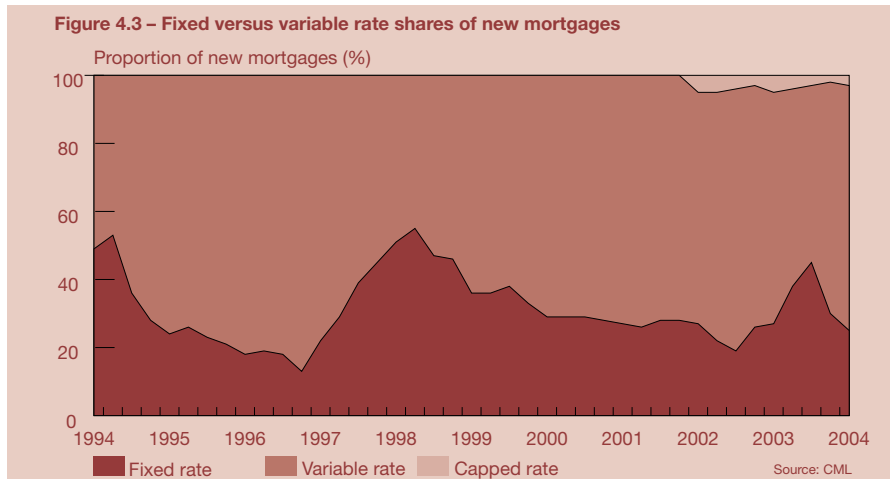
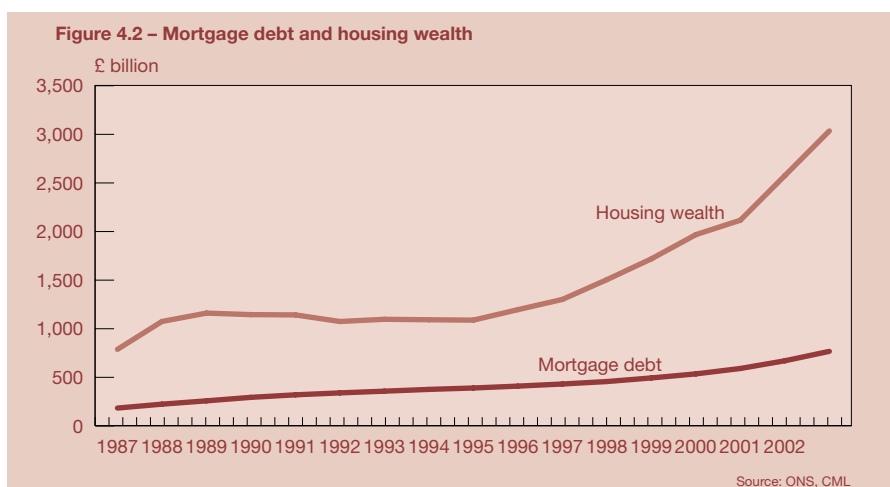
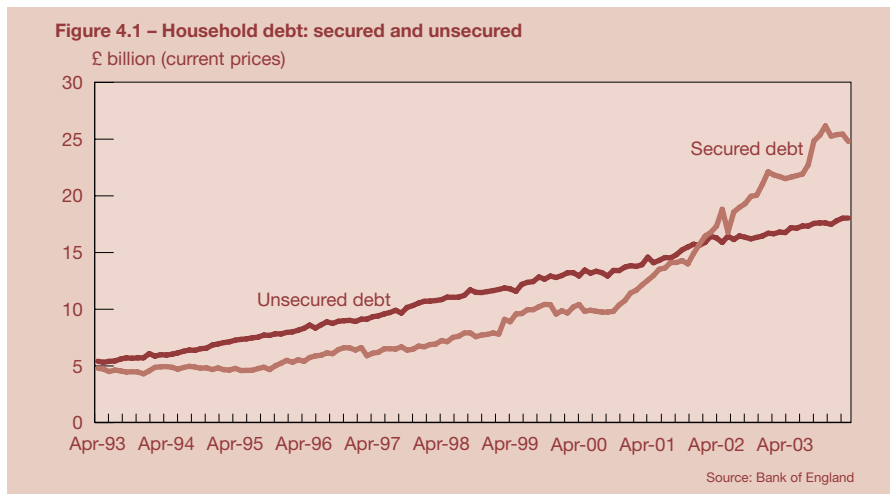
IV - How affordable is UK household debt?

Introduction

UK household debt has risen to historically high levels in recent years as consumers have borrowed to raise spending levels relative to incomes. But, thanks to low interest rates, the burden of debt-servicing costs has barely changed over the past decade, and there is only limited evidence of increasing financial distress. Interest rates have now begun to rise, however, and financial regulators, such as the Financial Services Authority and the Bank of England, are becoming increasingly concerned about the affordability of debt going forward. Some consumers are highly exposed to any significant rise in interest rates, while other consumers may have underestimated their future real debt levels in a climate of persistently low inflation. Trends in the affordability of debt will have implications for consumer financial distress and for consumer spending generally, which in turn could have important implications for all businesses exposed to developments both in the UK consumer debt market and more widely in the market for other consumer goods.

In this special article, we review recent trends in consumer debt, servicing costs and financial distress in the UK, identifying trends for different types of debt and different types of consumer. Based on a macroeconomic model of financial distress, we consider the possible future dynamics for UK household debt and develop scenarios for financial distress based on our broader macroeconomic scenarios. The article, which complements the discussion of housing market prospects in Section III above, is organised as follows:

- Section IV.1 summarises recent trends in use of household debt;
- Section IV.2 describes the burden of debt on households;
- Section IV.3 examines the incidence of financial distress;
- Section IV.4 describes two econometric models of financial distress, looking at mortgage arrears and individual bankruptcies;



- Section IV.5 presents and discusses two alternative future scenarios for mortgage arrears and individual bankruptcies in the UK; and
- Section IV.6 summarises and draws conclusions from the analysis.

Technical details of the two econometric models are contained in an Annex.

IV.1 – Recent trends in the use of household debt

From 1995 to 2003, consumer spending in nominal terms grew by an average of 5.7% per annum, significantly higher than average household disposable income growth of 5.2% per annum. The gap between the two equated to a decline in the household savings rate from 10% to 5.7%

over this period, which coincided with a relatively sharp sustained rise in consumer borrowing (see Figure 4.1 for Bank of England figures on gross lending by individuals). After adjusting the figures for consumer price inflation, unsecured gross lending to consumers doubled in real terms from 1995 to 2003, while the increase in secured gross lending was even greater, more than quadrupling in real terms. In this section we review recent trends in secured and unsecured lending, and identify the main drivers of increasing household debt.

Debt secured on dwellings

The sharp rise in secured lending to individuals has, to a large extent, reflected a sharp increase in the stock of mortgage debt. Rising house prices have pushed up the mortgages required for house purchase, and they have also allowed increased mortgage equity withdrawal by current homeowners. It should be noted, however, that the rise in the stock of mortgage debt since 1997, while large, has not been as great as the increase in housing wealth over the same period (see Figure 4.2).

Over the past few years, the rise in mortgage debt has been chiefly focused on existing homeowners, as first-time buyers have been increasingly priced out of the market. Since the beginning of 1997, UK house prices, as measured by Nationwide¹, have increased two and half fold, while household disposable income has increased by only 42%. But required deposits have not fallen and loan-to-income ratios have only begun to rise significantly since 2002 (see Figure 3.9 in Section III above). Consequently, the proportion of first-time buyers has fallen to historic lows. In contrast, many existing homeowners have exploited increased housing wealth to take on additional mortgage debt to finance buy-to-let investments. More details of recent trends in the housing market can be found in Section III above.

The proportion of new mortgages that have fixed interest rates, as a percentage of all newly agreed mortgages, has fallen since the middle of 2003 (see Figure 4.3), with some commentators suggesting that

Figure 4.4 – Sources of Finance

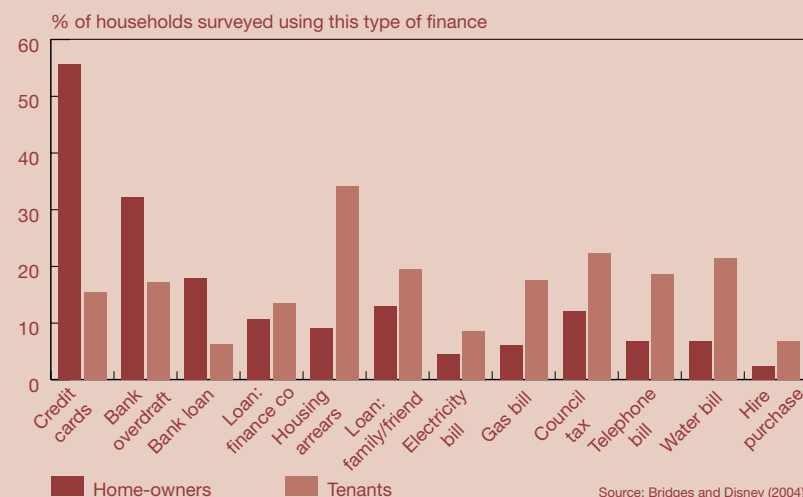
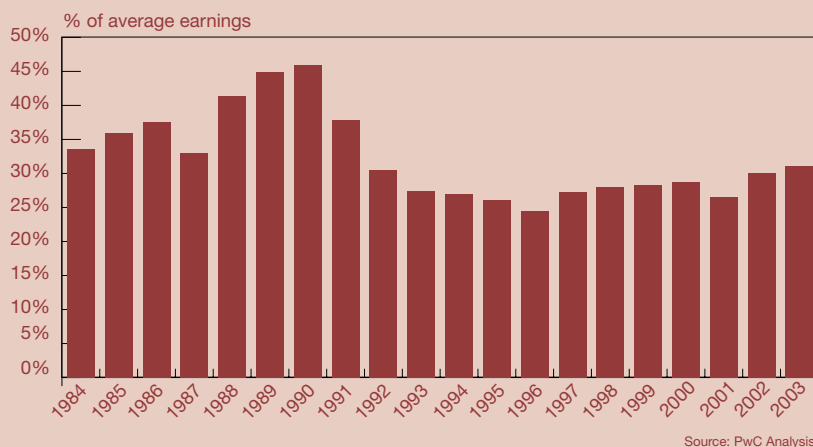


Figure 4.5 – First-timer-buyer mortgage payments



consumers have been attracted by the currently lower variable interest rates. Furthermore, even so-called "fixed" rate mortgages only fix rates for 2-5 years in the UK, so mortgage debt holders remain highly exposed to interest rate fluctuations either in the short term or the medium term.

'High street' consumer credit

Consumers have also been increasing their use of various forms of 'high street' credit, including:

- **credit cards**, where growth in unsecured lending has been the most rapid. Between 1994 and 2002, the number of active credit card balances increased from around 13 million to nearly 30 million²; the outstanding balances on credit cards rose by an average of 18% per annum from 1995 Q1 to 2004 Q1, from £12 billion to £54 billion³;

- **personal loans**, which have also increased in recent years, but by less than credit card debt; in the three years to April 2004, outstanding balances on structured personal loans increased by 34%, compared to a 47% increase for credit cards⁴; and
- **overdrafts**, which have also grown, by about 30% over the three years to April 2004.

A key driver of the growth in credit card debt has been the decline in nominal interest rates, perhaps reflecting an increasingly competitive market. Bank of England data are available only from September 1998, but from that date average credit card interest rates fell from 22.3% to 14.8% in March 2004, while the official base rate fell only from 7.5% to 4%. In contrast, the average interest rate for overdrafts fell by slightly less than the base rate over the same period, from 17.2% to 14.9%.

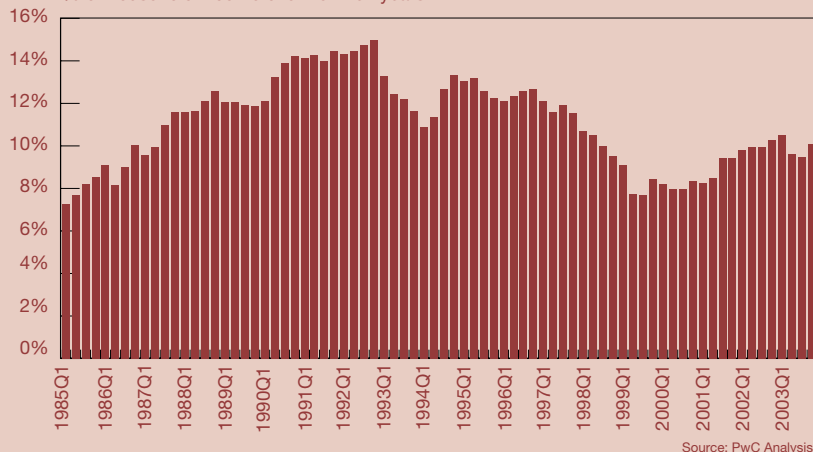
¹ It should be noted that house prices as measured by the ODPM have increased by less over this period (about 220% increase) – although still by far more than the increase in household incomes.

² APACS data, see <http://www.apacs.org.uk>

³ Bank of England data.

⁴ British Banking Association data.

Figure 4.6 – Expected interest payments over next ten years
 % of household income over next ten years



Source: PwC Analysis

As noted above, the increase in house prices have tended to result in fewer first-time buyers, rather than more heavily indebted first-time buyers. But recently there has been a noticeable increase in the proportion of first-time buyers undertaking mortgages with relatively high loan to income multiples, as occurred during the late 1980s.

Real interest rates have fallen by less than nominal interest rates, however, and the expected longer term burden of debt is likely to have increased in recent years. The expected burden of debt over the longer term is determined by expected income growth and interest rates – and any reduction in interest rates due to lower inflation will tend to be offset by lower income growth in the longer term. We have produced some illustrative numbers for the expected burden of mortgage debt based on an assumption of 2% real annual income growth and real mortgage rates equal to the index-linked gilt yield plus 0.75%⁵. As can be seen in Figure 4.6, on this basis the expected real burden of debt over the next ten years has increased since 1999, although it remains well below the highs reached during the early 1990s recession.

Other forms of consumer credit

There are also less formal types of borrowing that can be utilised by consumers. Bridges and Disney⁵, two economists at the University of Nottingham, recently examined data from the Families and Children Survey to understand the use of credit, default and arrears in all of their forms. They found that low income families utilise a wide variety of credit arrangements. For instance, while access to ‘high street’ credit might be constrained, temporary non-payment of regular household bills, or loans from family and friends, can be a cheaper alternative to finance current expenditure.

The Bridges and Disney analysis of the use of different forms of debt is summarised in Figure 4.4. Home-owners tend to have much better access to ‘high street’ credit and so tend to use alternative sources of finance less frequently than tenants do. Both home-owners and tenants, however, often use late payment of utility bills (or rent or council tax) as a form of finance when they face difficulties in meeting payments on other debts and bills. For instance, 88% of those surveyed with arrears on loans from financial institutions were also in arrears with utility bills.

IV.2 – The burden of household debt

While there has been a very significant increase in the amount of outstanding household debt over the past decade, it does not necessarily follow that this

increase has created a commensurate significant rise in the burden of debt on households, due to falls in interest rates. Lower nominal interest rates will, in the short term, reduce debt servicing costs and can allow credit constrained consumers to borrow more. Real interest rates determine the burden of debt in the longer term, however, which may have been overlooked by some consumers (as discussed in Section III above in relation to mortgages).

Debt secured on dwellings

The massive increase in mortgage debt since 1997 has not led to a significant rise in the burden of mortgage debt across the economy, unlike the last period of rapid house price growth in the late 1980s (see Figure 3.8 in Section III above). Interest rates fell to historic lows during 2001-3, reducing the cost of servicing variable rate mortgages. Adding on the cost of regular mortgage repayments suggests that total mortgage costs are close to their long run average relative to incomes, but they are still clearly much lower than during the late 1980s.

The mortgage costs of first-time buyers have risen by somewhat more than the average, however, as house prices have grown more rapidly than mortgage debt. Based on a twenty year mortgage, the average first year mortgage payments for first-time buyers rose from 28% to 31% of average earnings between 1999 and 2003 (see Figure 4.5). This percentage is, however, much lower than during the late 1980s, when estimated first-time mortgage payments rose to around 45% of average earnings.

‘High street’ consumer credit

Despite the rapid growth in credit card debt in recent years, the burden of servicing this type of debt has not increased significantly as a percentage of household income since 1998, due to the sharp fall in credit card interest rates. The smaller increases in other forms of consumer credit have also been largely offset by falling interest rates, so that total income gearing, measured as total debt servicing costs as a percentage of household income, has not risen significantly. Again, however, it is important to note that the fall in nominal interest rates has been greater than the fall in real rates, so the longer term burden of debt may have increased by more than some borrowers realise.

IV.3 – Financial distress among UK consumers

The clearest indication about the affordability of consumer debt levels in the

⁵ Bridges, S. & Disney, R., “Use of credit and arrears on debt among low-income families in the United Kingdom”, Fiscal Studies, March 2004, Vol.25, No.1
⁶ From Section III, average post-tax real mortgage rates were, on average, 0.75% higher than index-linked gilts over the 1983-2003 period.

Figure 4.7 – Mortgage arrears and repossessions

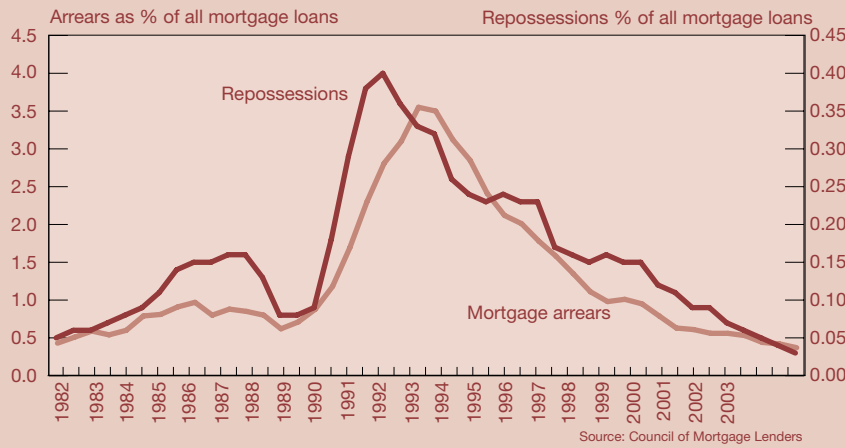
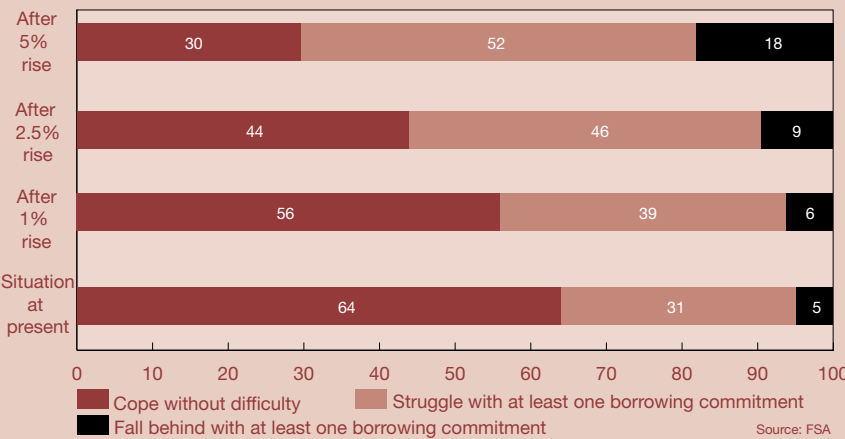


Figure 4.8 – Impact of interest rate rises on families



of future interest rate rises (see Figure 4.8). 36% of families reported struggling with at least one form of borrowing at present, but this could rise to 56% in a scenario where interest rates increase by 2.5 percentage points (i.e. from 3.5% at the time of the survey in September 2003 to 6%). The proportion of families that believe that they would be sure to fall behind with at least one debt commitment would nearly double from 5% to 9% in this scenario.

Lower down the 'debt hierarchy', there has been a significant increase in credit card arrears in recent years (see Figure 4.9). Credit card write-offs have also risen, although these figures are heavily influenced by credit card fraud, as well as financial distress among consumers.

There is also some (rather mixed) evidence of increased arrears in payment of utility bills, rent and local taxes. Water UK reports that non-payment of water bills has increased significantly since 1999, although this may also be related to legislative changes. Many local authorities have reported increased non-payment of council tax, although this may be related to increases in council tax bills rather than to higher household debt levels.

UK should be presented by evidence of financial distress. But indicators of financial distress among consumers are mixed, with falling levels of distress for mortgages, but rising levels of distress for unsecured and informal debts, as well as rising individual bankruptcies. These trends highlight the role of housing wealth as collateral securing high levels of consumer debt. When housing wealth is not available, growing debt levels have led to increasing financial distress and default. In this section we review the incidence of financial distress and recent trends in arrears and defaults.

Recent trends in financial arrears

The relatively low current levels of mortgage debt servicing costs relative to incomes, and the high levels of housing wealth (and therefore collateral) have produced low levels of mortgage arrears and repossessions in recent years (see Figure 4.7). In 1992, at the peak of the early 1990s

recession, 3.5% of all mortgages were in arrears for at least six months, but this had fallen to only 0.37% of mortgages by the second half of 2003. Repossessions have followed a similar trend.

Mortgage payments are commonly viewed as being close to the top of the 'debt hierarchy', in the sense that consumers will aim to pay mortgage commitments before most other forms of debt. A September 2003 National Statistics Omnibus Survey commissioned by the Financial Services Authority (FSA) supported this view. The survey estimated that 6.9 million families in the UK were either struggling or falling behind with at least one of their borrowing commitments. Families were most likely to struggle with overdrafts (42% of those with an overdraft) and credit cards (44% with credit cards – one million families). Only 20% of mortgage holders reported concerns about meeting the mortgage commitments⁷.

The Omnibus Survey also asked families with mortgages about the possible impact

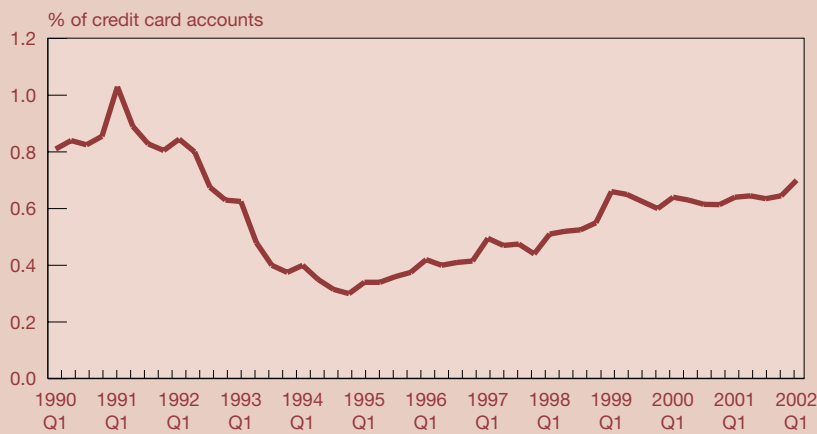
Individual bankruptcies

Bankruptcy is the final resort for people who are no longer able to maintain their borrowing commitments. Figure 4.10 presents the official statistics on the number of individual bankruptcies in the UK since 1990. Following high numbers of bankruptcies during the early 1990s recession, the number fell to a low at the end of 1997, but has since begun to rise again. This trend in the total conceals significantly divergent trends amongst different types of individuals declaring bankruptcy, however, as the number of self-employed individuals has continued to decline steadily since 1997, whereas there has been a sharp increase in the number of employed and unemployed individuals.

Part of the recent increase in bankruptcies can be explained by a rise in students declaring bankruptcy, which is related to the rise in student debt levels. According to the Student Loans Company, 899

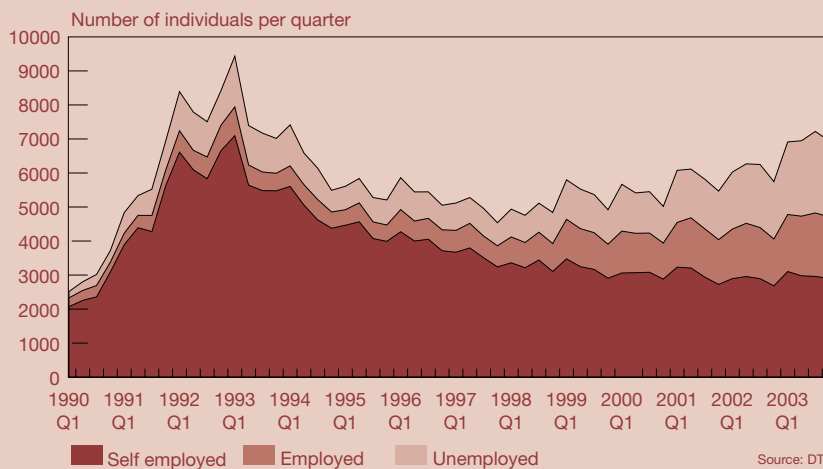
⁷ However, the CPP Group reported in May 2004 that nearly a third of the mortgage holders that they surveyed are concerned about meeting their mortgage payments over the next three months, up from only 18% in May 2002.

Figure 4.9 – Credit card payment arrears of three months or more



Source: APACS data from BoE Working Paper 214

Figure 4.10 – Individual bankruptcies in England & Wales



Source: DTI

student loan holders filed for bankruptcy in 2003, compared to 276 in 2002, 97 in 1998 and only 8 in 1992. The sharp increase in 2003 accounted for just under 20% of the increase in the total number of non-self-employed bankruptcies, although it has accounted for only 9% of the increase since 1998.

The Financial Services Authority (FSA) links the majority of the rise in individual bankruptcies with the increase in consumer debt levels and, in particular, the growth of the sub-prime lending market⁸, which can leave individuals at risk of bankruptcy in the case of unemployment or unexpectedly low incomes. The FSA suspects that legislative changes in April 2004 due to the introduction of the Enterprise Act are likely to fuel further growth in the number of individual bankruptcies in the future.

IV.4 – Macroeconomic models of financial distress

In order to shed light on the direction of trends in financial distress in the short to medium term, we have developed macroeconomic models of financial distress for two of the key indicators discussed above:

- the proportion of mortgages in arrears (for six months or more); and
- the number of bankruptcies of employed and unemployed individuals.

We have found that past trends in these economy-wide indicators of financial distress can be linked to broader economic indicators using econometric techniques. This allows us to develop scenario forecasts for these indicators for the next three years, to help us to understand the outlook for financial distress going forward.

There are other indicators of financial distress (for example, credit card arrears and late payment of utility bills) that could be amenable to macroeconomic analysis, but in this article we have chosen to focus on the two indicators we judged to be of the greatest importance to broader macroeconomic trends.

Modelling financial distress

A recent Bank of England working paper⁹ provides a useful summary of the academic literature identifying the key drivers of financial distress. The paper identifies two apparently competing approaches¹⁰ to modelling distress:

- the 'equity' approach, where borrowers base their default decisions on a rational comparison of the financial costs and returns involved in meeting debt commitments; and
- the 'ability-to-pay' approach, where borrowers continue to meet their debt commitments if they have the income to do so.

For mortgage arrears, the 'equity' approach would suggest that debt-holders would consider their relative financial position, perhaps measured by loan-to-value ratios of new mortgages or the level of undrawn equity (house prices minus mortgage debt). Consequently, 'negative equity' could be expected to increase mortgage arrears as debt-holders may decide that maintaining debt payments is no longer the rational option.

For general bankruptcy, the relative financial position of households could be indicated by total household financial wealth (including housing wealth) minus liabilities or, more approximately, by debt to income ratios. The decision to declare bankruptcy will also be affected by the severity of bankruptcy legislation and social attitudes towards bankruptcy, which could change over time.

The 'ability-to-pay' approach is most directly indicated by measures of income gearing, such as the ratio of interest payments to income. Short term income difficulties may also be indicated by the

⁸ See "Financial Risk Outlook 2004", available from <http://www.fsa.gov.uk>

⁹ Bank of England working paper 214, Whitley, J., Windram, R. & Prudence, C., "An empirical model of household arrears", 2004.

¹⁰ The authors argue that the two approaches are related, with the 'ability-to-pay' approach being a special case of the 'equity' approach where borrowers are prevented from behaving 'rationally' by liquidity constraints and imperfect capital markets.

unemployment rate and by indicators of relationship breakdown¹¹.

It is likely that both approaches influence the occurrence of financial distress, as confirmed by the academic evidence reviewed. We have therefore constructed a data set for our analysis that attempts to capture key indicators relevant to both the 'equity' and 'ability-to-pay' approaches. Table 4.1 describes this dataset. We have used a dataset similar to that of the Bank of England working paper, which estimated a broadly similar model for mortgage arrears¹².

We have employed standard econometric techniques, similar to those used in the Bank of England working paper, to estimate forecasting models for mortgage arrears and bankruptcies (further details of the econometric approach and results can be found in the Annex at the end of this article).

The reliability of the forecast model for mortgage arrears can be judged from Figure 4.11, which compares actual mortgage arrears with those predicted by the model. The 'Fitted A' line provides model estimates based on actual mortgage arrears in the previous quarter, so it is perhaps not surprising that the fit is very good. Greater reassurance should be drawn from the 'Fitted B' line, which provides model estimates based on actual mortgage arrear numbers from two years previous. The 'Fitted B' line is less precise, but does correctly predict the turning points in 1986, 1988 and 1992-3.

Similarly, Figure 4.12 presents actual and 'fitted' data for bankruptcies of employed and unemployed individuals. Again, the two-year 'forecast' provided by the 'Fitted B' line is reasonably reliable, predicting the turning points of 1993 and 1995, as well as the growth period between 1998 and 2003.

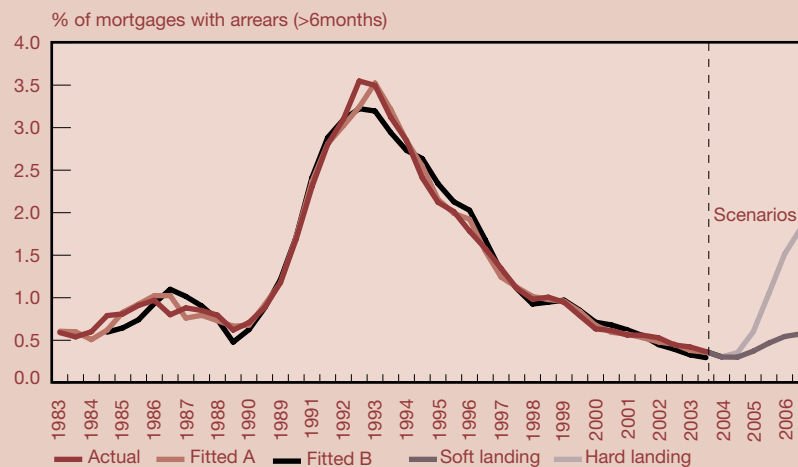
IV.5 – Alternative future scenarios for financial distress in the UK

We have employed our two macroeconomic models of financial distress to develop scenarios for mortgage arrears and individual bankruptcies in the UK over the next three years. We have constructed

Table 4.1 – Data set for economic analysis

Code	Variable	Source	Construction
MA	Mortgage arrears	Council of Mortgage Lenders	Percentage of mortgage accounts with arrears in excess of 6 months
LBK	Individual Bankruptcies	Department of Trade & Industry	Log of bankruptcies of employed and unemployed (excl. self-employed) individuals in England & Wales
MIG	Mortgage debt income gearing	National Statistics	Mortgage interest payments as percent of household disposable income
HIG	Household debt income gearing	National Statistics	Household interest payments as percent of household disposable income
UND	Unsecured debt	Bank of England	Outstanding level of unsecured debt held by UK residents, as a percent of household disposable income
UHE	Un-drawn housing equity	National Statistics	Equal to total housing wealth minus mortgage debt, as a percent of household disposable income
DUN	Change in unemployment	National Statistics	Change in unemployment rate on previous quarter

Figure 4.11 : Mortgage arrears: actuals, modelled and scenarios



two alternative scenarios for the UK economy which seek to capture the uncertainty in the UK housing market at present: a 'soft-landing' scenario for the housing market; and a 'hard-landing' scenario. As discussed in Section III above, both scenarios are possible, and in this section we describe the potential impact on mortgage arrears and individual bankruptcies in each scenario, using the models described above.

Underlying these two scenarios are illustrative projections for key variables, including consumer spending growth, household incomes, interest rates and house prices. For this analysis, we have translated these scenarios into forecasts for the drivers of our econometric models as follows:

- consumer borrowing scenarios are based on the discrepancy between household incomes and consumer spending growth, as well as housing wealth;
- consumer debt burden scenarios are based on interest rates, household income growth and consumer borrowing scenarios; and
- housing wealth scenarios are based on house price scenarios and an assumed trend rate of increase in the stock of housing¹³;

Table 4.2 sets out the various scenarios that have been constructed for the purposes of this analysis. We have fed these scenarios into the two econometric models described above, in order to

¹¹ See Coles, A. (1992) "Causes and characteristics of arrears and possessions", Council of Mortgage Lenders Housing Finance, No. 13. Coles surveyed mortgage lenders and found that 20-25% of arrears and repossessions were linked to relationship breakdown. Another 40% were linked to other income shocks, such as unemployment and business failure.

¹² The Bank of England paper includes estimated models for mortgage arrears and credit card arrears. It does not include analysis of individual bankruptcies.

¹³ We therefore implicitly assume that the price elasticity of housing supply is zero, at least in the short term. Recent evidence showing a lack of a strong supply response to higher house prices supports this simplifying assumption, at least for a three year forecast horizon.

generate alternative scenarios for mortgage arrears and individual bankruptcies for the period to 2006 in each scenario, as summarised in Table 4.3 and discussed in more detail below.

Soft-landing scenario

In the soft-landing scenario, house price inflation slows to a stand-still in 2005, but there are no significant falls in average house prices. Official interest rates peak at only 5% and income growth remains relatively buoyant. In this scenario, our models suggest rising consumer financial distress but at low levels compared to the early 1990s recession.

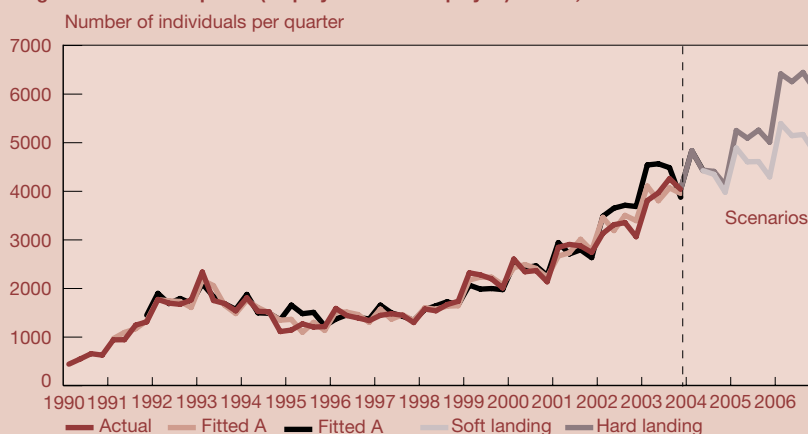
For mortgage arrears, rising interest rates and high levels of mortgage debt lead to a pick up in the burden of debt servicing charges, while there is no further increase in un-drawn housing equity as house price inflation slows. Consequently, mortgage arrears hit a minimum of just over 0.3% of total mortgages in 2004 before rising to just under 0.6% of total mortgages by the end of 2006 (see Figure 4.11). While this would represent a near doubling of the proportion of households in mortgage arrears, the total would still remain low compared to the levels seen throughout the 1990s.

Our model suggests that the rise in bankruptcies of employed and unemployed individuals will continue over the next three years, but at a slower rate in the soft-landing scenario. Recent rapid growth in bankruptcies has been linked to rising unsecured debt levels, according to our econometric analysis. In the soft-landing scenario, growth of unsecured debt is assumed to slow to more sustainable rates, leading to a slowdown in the growth of bankruptcies (see Figure 4.12). Numbers still rise, however, due to the assumed increase in interest rates, and therefore the cost of servicing existing debt.

Hard-landing scenario

In the hard-landing scenario, average house prices would continue to rise relatively rapidly throughout 2004 (by an average of 8.2%), driving continued strong consumer

Figure 4.12 - Bankruptcies (employed and unemployed): actual, modelled and scenarios



Source: PwC analysis

Table 4.2 - Two scenarios for UK housing market and related variables

		2003	2004	2005	2006
Real GDP growth	Soft-landing	2.2%	3.0%	2.5%	2.4%
	Hard-landing		3.1%	2.2%	1.0%
Real consumer spending growth	Soft-landing	2.5%	3.1%	2.1%	2.0%
	Hard-landing		3.6%	2.6%	0.4%
Official interest rates	Soft-landing	3.7%	4.3%	5.0%	5.0%
	Hard-landing		4.5%	6.1%	6.0%
House prices (ODPM index)	Soft-landing	18.2%	4.7%	-0.8%	1.5%
	Hard-landing		8.2%	0.9%	-9.0%
Mortgage debt	Soft-landing	14.3%	7.4%	1.5%	3.0%
	Hard-landing		11.0%	4.5%	2.0%
Unsecured debt	Soft-landing	7.8%	5.6%	4.6%	4.0%
	Hard-landing		6.5%	5.0%	2.0%
Mortgage interest gearing	Soft-landing	4.3%	4.9%	5.3%	5.3%
	Hard-landing		5.1%	6.6%	6.4%
Total debt interest gearing	Soft-landing	7.2%	8.0%	9.0%	8.8%
	Hard-landing		8.5%	11.1%	10.9%

spending growth and consumer borrowing in 2004. Consequently, interest rates would be driven up to a peak of 6.5% in the summer of 2005, triggering a sharp fall (a 'hard-landing') in house prices during 2006. Consequently, this scenario envisages a high consumer debt burden and falling housing wealth in 2005-6. In this hard-landing scenario, therefore, our models suggest quite rapid increases in consumer financial distress, but still to lower levels than during the early 1990s recession.

Mortgage arrears would increase rapidly in this scenario, initially due to high levels of mortgage debt and the increase in interest rates during 2004-5, but then subsequently driven by the sharp fall in house prices that would reduce un-drawn housing equity in 2006. Consequently, the proportion of mortgages in arrears in this scenario could

increase by a factor of six, from the lows expected in the first half of 2004 of around 0.3% of total mortgages, to in excess of 1.6% (see Figure 4.11). While this would represent a sharp increase from recent low levels of mortgage arrears, the total would still remain lower than levels of mortgage arrears witnessed during the early 1990s recession. During that recession, falling housing wealth was compounded by interest rates that peaked at 15%, which is not at all likely in our hard-landing scenario.

Similarly, our econometric results point to a significantly greater rise in bankruptcies in the hard-landing scenario than in the soft-landing scenario. The econometric analysis suggests that bankruptcies are driven by unsecured debt levels, which would continue to rise rapidly with strong consumer spending growth in 2004, and

Table 4.3 – Summary of scenarios for household financial distress

	Scenarios	2003	2004	2005	2006
Mortgage arrears (% of total)	<i>Soft-landing</i>	0.39%	0.30%	0.42%	0.56%
	<i>Hard-landing</i>		0.33%	0.83%	1.66%
Individual bankruptcies (number)	<i>Soft-landing</i>	16,079	17,600	18,400	20,500
	<i>Hard-landing</i>		17,800	20,600	25,200

Source: PwC analysis

interest rates, which would also rise further in this scenario. The number of bankruptcies of employed and unemployed individuals could rise from around 16,000 in 2003 to over 25,000 in 2006 (see Figure 4.12).

Potential impact on other forms of debt

An increase in mortgage arrears would be likely to be preceded by an increase in arrears on other forms of debt, as evidence on the relatively high position of mortgage payments on the ‘debt hierarchy’ might

suggest. But, as Bank of England research (Working paper 214) has shown, the evidence that credit card arrears precede mortgage arrears is not strong and the former precede the latter by no more than one quarter on average.

III.6 – Summary and conclusions

Rising levels of UK household debt have been supported both by historically low interest rates and by rising house prices. Most plausible scenarios for the UK

economy suggest that these factors are likely to become less accommodating over the next two years, which suggests that household financial distress is likely to increase.

Our econometric analysis of two indicators of financial distress supports this view although, importantly, it suggests that any rise in mortgage arrears is likely to be less pronounced than during the early 1990s recession due to the lower level of nominal interest rates at present. Nonetheless, if house prices fall, then some borrowers are likely to face ‘negative equity’, thus increasing the likelihood of financial distress significantly. Households with high credit card debts and relatively low income and asset levels could also be highly exposed to any further rise in interest rates, resulting in a further rise in personal bankruptcies, as predicted by our model.

Annex: Econometric models

We employed a single equation, linear dynamic model structure¹⁴ to estimate econometric models for mortgage arrears and bankruptcies, which were regressed on past values of themselves plus current and past values for the potential drivers that we have identified. The results of this regression analysis are set out in Table 4.4 (in which absolute t-values greater than 2 indicate statistically significant explanatory variables). The analysis also included seasonal dummies to take account of the seasonality of the data (only significant for the bankruptcy data). Below we set out the key results, including the estimated long term relationships between variables, which can be calculated from the co-integrating relationships presented in Table 4.4 (see footnotes ¹⁵ & ¹⁶ for details of the calculations).

The key results for **mortgage arrears** can be summarised as follows:

- the current rate of mortgage arrears (MA) is heavily correlated with past mortgage arrears;
- a one percent increase in un-drawn housing equity (UHE) causes mortgage arrears to fall by only 0.0048% of the total number of mortgage holders in the short term ¹⁵; but in the long term, mortgage arrears would lead to a fall of 0.044% of the total number of mortgage holders ¹⁶; after three years, one half of the long-term impact on mortgage arrears has occurred;
- a one percentage point rise in mortgage interest payments as a proportion of

Table 4.4 – Results of regression analysis

MA	Variable	MA_1	UHE	MIG_1	DUN	
	Coefficient	0.89046	-0.48412	1.993562	0.22037	
	t-value	(58)	(-6.9)	(9.9)	(8.3)	
LBK	Variable	LBK_1	HIG_1	UND_1	UHE_1	Constant
	Coefficient	0.89695	2.25257	1.0756	-0.0803	-0.15888
	t-value	(13.4)	(3.5)	(3.5)	(-2.2)	(-0.9)

Note: Lagged variables indicated by *underscore*. Seasonal adjustments conducted on bankruptcy data. Insignificant constant included for bankruptcy equation as it improves in-sample forecast accuracy. Statistically significant explanatory variables indicated by absolute t-value above 2 (at 95% confidence level). Source: PwC analysis

income (MIG) leads to an increase in mortgage arrears by 0.18% of the total number of mortgage holders in the long term; again, the short term effect is less, with one half of the impact occurring after three and a half years; and

- a one percentage point rise in the unemployment rate (DUN) pushes up the rate of mortgage arrears by 0.22% of the total number of mortgage holders; this is a short term effect only, as the level of unemployment does not affect mortgage arrears in the long term, according to the estimated model.

The results for **bankruptcies** of employed and unemployed individuals are broadly similar:

- the rate of bankruptcies (LBK) is heavily correlated with past bankruptcies;
- a one percentage point rise in household interest payments as a proportion of incomes (HIG) results in a 22% increase in bankruptcies in the long run;
- a one percentage point rise in unsecured debt as a proportion of income (UND)

results in a 10% increase in bankruptcies in the long term;

- a one percentage point rise in un-drawn housing equity as a proportion of income (UHE) results in a 0.8% fall in bankruptcies, over the long term; and
- we were not able to find a significant relationship between individual bankruptcies and unemployment, which was surprising; this may reflect the relatively limited data series available (1990-2003).

Overall, the econometric results suggest that financial distress is strongly linked to both interest payments and net debt levels (net of the value of housing) relative to incomes. An increase in consumer debt will lead to financial distress if it is not matched by an increase in housing wealth. By implication, therefore, a fall in housing wealth could trigger financial distress without increases in interest payments, as implied by the 'equity' approach to modelling payment arrears.

¹⁴ Mortgage arrears and bankruptcies may be important influences on other indicators such as house prices, consumer spending and, consequently, interest rates. This would suggest that house prices, consumer spending and interest rates should be modelled simultaneously with indicators of financial distress, to capture the dynamics between the variables. Such multiple equation systems estimation is beyond the scope of this article, but might be a topic for future research.

¹⁵ The co-efficient for UHE is -0.48412. As mortgage arrears is measured in percentage points, the short term impact equals $0.01 \times -0.48412\% = 0.0048412\%$.

¹⁶ The long term impact can be calculated from the co-integrated equation shown, as $-0.48412\% / (1 - 0.89046) = 0.044\%$.