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# THE IMPACT UNSECURED DEBT ON FINANCIAL DISTRESS AMONG BRITISH HOUSEHOLDS (\*)

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## **Abstract**

This paper uses evidence from the British Household Panel Survey (BHPS) to examine how attitudes towards unsecured debt are related to household finances and other characteristics. An ordered-logit model is estimated for 1995 and 2000 using a self-reported indicator of financial distress as the dependent variable. This analysis suggests that the main factors causing debt problems are the unsecured debt-income ratio, the level of mortgage income gearing, the level of financial wealth of households, their health, ethnicity and marital status. While the proportion of households reporting debt problems did not change between 1995 and 2000, there were important shifts among different groups. In particular, more households in the youngest age group reported debt repayments were a heavy burden in 2000, while the opposite applies to the oldest age group where a smaller proportion of households than in 1995 reported debt was a heavy burden. These changes can largely be accounted for by the changing economic circumstances of these groups rather than an unrelated shift in attitudes. In particular, the increase in indebtedness of the young was the main factor accounting for their greater tendency to report debt problems.

**Key words:** Unsecured debt, British Household Panel Survey, ordered-logit.

**JEL classification:** C25, D14, D91

## Summary

Unsecured borrowing by British households, mainly in the form of personal loans, overdrafts and credit cards, has grown rapidly over the past decade or so. This has led to widespread concerns that many households have taken on more debt than they can easily afford, with possible future consequences for macroeconomic and financial stability.

This paper examines survey evidence on the extent to which households consider unsecured debt to be a burden, using this as an indicator of financial distress. Its aim is to quantify the level at which unsecured debt becomes a problem for the typical household and what other factors affect this outcome. The paper uses evidence for 1995 and 2000 from the British Household Panel Survey (BHPS), which since 1995 has questioned households about their attitudes to unsecured debt.

We examine how attitudes to debt are related to survey measures of the amount of debt that people have and its affordability. We find that, in general, there is a clear link between the subjective measure of financial distress and indicators of the affordability of debt. Our estimates suggest that the main determinant of debt problems is the unsecured debt to income ratio. There is no clear point at which debt becomes a problem, but our analysis suggests, for example, that having an unsecured debt-income ratio above 12% (the 70<sup>th</sup> percentile of households with any debt) adds at least 17 percentage points to the probability of unsecured debt being somewhat of a burden and 4 percentage points to the probability of it being a heavy burden, compared to households without any debt. Nevertheless, our estimates also show a general softening in attitudes towards debt, since the higher debt to income ratios observed in 2000 did not lead to an increasing likelihood of reporting debt to be somewhat or a heavy burden. We attribute this to the greater affordability of debt in 2000.

Other than the unsecured debt to income ratio, the most important factors affecting the likelihood of a household reporting debt to be somewhat of a burden in 2000 were the level of mortgage income gearing, the level of financial wealth of the household, their health, ethnicity and marital status. Having mortgage income gearing above 20% of income added about 9 percentage points to the probability of reporting debt to be somewhat of a burden. Being unemployed was also associated with a higher probability of reporting debt problems.

While the proportion of households reporting debt problems did not change between 1995 and 2000, there were important shifts among different groups. In particular, more households in the youngest age group reported debt repayments were a heavy burden in 2000, while the opposite applies to the oldest age group where a smaller proportion of households than in 1995 reported debt was a heavy burden. By income group, the main change was a sharp fall in 2000 in the proportion of very low income households who reported that debt was a heavy burden.

The paper shows that these changes can largely be accounted for by the changing economic circumstances of different groups rather than an unrelated shift in attitudes. The increase in the median debt to income ratio of the young from just under 8% in 1995 to a level between 10% and 14% in 2000 was the main factor accounting for their greater tendency to report debt problems.

While any given level of indebtedness was less problematic in 2000 than 1995, the increased quantity of unsecured debt taken on by these groups meant that they were more likely to face problems and be vulnerable to potential shocks in their income and interest rates. Moreover, the evidence suggests that the likelihood of reporting debt to be a burden increased for households with high debt to income ratios who also experienced

an adverse financial shock. This suggests that, while the greater indebtedness of British households in 2000 had not raised the perceived burden of debt, some would be more vulnerable to adverse economic shocks should these occur in the future.

## 1 Introduction

Unsecured borrowing by British households, mainly in the form of personal loans, overdrafts and credit cards, has been growing very rapidly in recent years. This has led to widespread concerns that many households have taken on more debt than they can easily afford, with possible future consequences for macroeconomic and financial stability<sup>1</sup>.

While the outstanding aggregate stock of unsecured debt of the household sector is small in relation to the stock of mortgage debt and financial assets, the threat it poses to macroeconomic and financial stability is likely to be related to how it is distributed throughout the population. Given that better risk borrowers are able to consolidate debt into mortgages, it is possible that unsecured borrowing is increasingly being used by those not able to borrow elsewhere because they have either exhausted their mortgage capacity or are considered high risk. Of course, this is not the only possible explanation of the increase in unsecured debt. A more benign interpretation is that stable macroeconomic conditions and increased competition among lenders have encouraged people to take on more debt without this increasing the burden it imposes on them.

This paper examines survey evidence on the extent to which households consider unsecured debt to be a burden, using this as an indicator of financial distress. Its aim is to quantify the level at which unsecured debt becomes a problem for the typical household and what other factors affect this outcome. In general, the paper does not attempt to investigate the circumstances that have caused those households whose debt is a burden to get into that position<sup>2</sup>. For some, the burden is understood and willingly taken on when the debt is initiated, whereas for others debt only becomes a burden when circumstances change. The paper uses the BHPS<sup>3</sup>, which since 1991 has asked broadly the same group of people about their economic and social circumstances. In 1995 and 2000, households and individuals were asked about their unsecured debt and since 1995 they have been questioned about their attitudes to it. More recent information on the burden of unsecured debt as of September 2004 using a specially commissioned survey is described in May, Tudela and Young (2004).

Taken in isolation, self-reported attitudinal indicators of this type are difficult to interpret as different people may have different attitudes to the same economic circumstances. As such, they may not be very useful in measuring the objective economic circumstances that people face. Nevertheless, self-reported attitudes are important sources of information on the well-being of households. In this paper we examine how attitudes to debt are related to survey measures of the amount of it that people have and its affordability. We find that, in general, there is a clear link between the subjective measure of financial distress and indicators of the affordability of debt. This analysis allows us to highlight the most important factors in determining whether debt is likely to be considered a burden by households. Moreover, we are able to assess how attitudes have changed in response to the large increase in indebtedness of British households between 1995 and 2000. We find that the increased debt is not considered more of a burden in 2000 than it was in 1995. We attribute this to the greater affordability of debt in 2000.

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1. Recent analyses of this issue include Kempson et al. (2004).

2. We investigate the factors that determine the level of unsecured debt in a separate paper [Del-Río and Young (2005)].

3. The BHPS is managed by the ESRC UK Longitudinal Studies Centre with the Institute for Social and Economic Research at the University of Essex. Detailed information can be found in Brice et al. (2002) available at <http://www.iser.essex.ac.uk/bhps/>. The BHPS is an annual national survey whose sample has remained broadly representative of the population. The first wave corresponds to 1991 when 5,500 households and 10,300 individuals (aged over 16 years) were included. The sample excludes households located north of the Caledonian Canal in Scotland, and all new samples included in BHPS since 1997 are not considered in this paper since they only extend the coverage of some particular regions and groups of population.



The paper is organised as follows. Section 2 provides a preliminary analysis of unsecured debt and financial distress for UK households in the BHPS. Section 3 estimates the factors determining whether a household will face financial distress. Section 4 studies the role of financial surprises in explaining the probability of financial distress. Section 5 shows the distribution of estimated probabilities by age and income groups. Section 6 concludes.

## 2 Unsecured debt and financial distress in the BHPS

The BHPS constitutes a unique source of information on the financial position and socio-demographic characteristics of a representative sample of British families. In this paper we focus on the information it provides on the burden of debt and its relation to the amount of unsecured debt and the general financial position of each household. We first look at the distribution of unsecured debt across households and then analyse its relationship to the burden of debt.

Information on the stock of unsecured debt is available from the BHPS for 1995 and 2000 only. Unsecured debt in the BHPS covers financial commitments apart from mortgages and housing related loans. It specifically excludes credit card and other bills being paid off in full in the month of the interview. Respondents are shown a card prompting them about which forms of debt instruments they are using. In 1995, this card contained the following list of debt instruments: hire purchase agreements, personal loans (from bank, building society or another financial institution), credit cards, catalogue or mail order purchase agreements, DSS Social Fund loans, any other loan from a private individual, or anything else. Overdrafts and student loans were added to the list in 2000.

This change in the list of unsecured debt instruments affects any analysis attempting to compare responses across the two waves of the survey. As both types of instrument were available in 1995, it is not clear how respondents with overdrafts or student loans would have included this type of borrowing in their answers to the survey at that time without being prompted<sup>4</sup>. For example, they could have considered borrowing on overdrafts as a form of personal loan. But the change in question must leave room for doubt that this was the case. If borrowing using these instruments were entirely omitted in 1995, but not 2000, then a comparison would overstate the increase in unsecured household debt. There is some evidence against this in that Redwood and Tudela (2004) find that unsecured debt is more underreported relative to aggregate figures in 2000 than in 1995. This might suggest that the new listed instruments in 2000 were included in other categories in 1995. Throughout this analysis we assess the sensitivity of estimates to this potential problem by changing the sample in 2000. In particular, the analysis is usually presented both excluding and including households with student loans and overdrafts in 2000<sup>5</sup>. In addition, since full-time students are the main holders of student loans and overdrafts we also take into consideration the exclusion of this group from the sample in both years.

A likely reason for the addition of the student loan category in the 2000 survey is that loans had by then become the main form of financial support for students. Up to and including academic year 1997/98, students were funded under the system which was introduced in 1990/91, when non-income-assessed student loans were introduced to provide extra resources towards living expenses and partially to replace grants. The main grant rates were frozen at their 1990/91 values until 1994/95 when the shift from grant to loan was accelerated by reducing the level of grants and increasing loans. Further details on the extent of student loan finance are provided by Callender and Wilkinson (2003). This shift in the student finance regime towards loans is also likely to distort unsecured debt market participation and borrowing, especially among individuals and their families who have been students during the new regime. Again, we try to avoid this distortion by varying the sample to exclude those affected.

4. Overdrafts represented nearly 7% of the total number of debt instruments mentioned in 2000. Student loans were a less significant 1% of total debt instruments and would have been less important in 1995.

5. Note that households provide the total amount of debt they owe and the different classes of instruments they use. There is no information on the amount of debt by instrument. Therefore, when excluding households with overdrafts we are also excluding the debt that these borrowers may hold in other instruments.

According to the BHPS, around 48% of households had at least one form of unsecured debt in 1995 and 2000 (see Table A). If full-time students are excluded from the sample in both 1995 and 2000, this participation rate does not change (see last two columns in Table A)<sup>6</sup>. The average amount of unsecured debt<sup>7</sup> of borrowers doubled over these five years. For borrowers, median unsecured debt was £1,000 per debtor household in 1995, and £2,500 in 2000<sup>8</sup>. The median unsecured debt-income ratio increased from 5.5% to 9.0% per debtor household. This increase is still relatively high if borrowers with overdrafts and student loans are excluded in 2000 or if full-time students are not considered in both years. Households in the highest tail of the distribution (above the 90<sup>th</sup> percentile) had an unsecured debt-income ratio of 27.1% in 1995, while in 2000 this had increased to over 37.2%.

**Table A: Household unsecured debt and debt-income ratios in BHPS (1995 and 2000)**

	1995	2000	2000 (a)	1995	2000
				Excluding full-time students	
Number of households with no unsecured debt	2,351	2,281	2,281	2,289	2,269
Number of households with unsecured debt	2,181	2,189	2,110	2,112	2,113
Proportion of households with unsecured debt	0.48	0.49	0.48	0.48	0.48
Unsecured debt levels, for borrowers only (nominal values,£)					
mean	2,145	4,255	4,002	2,121	4,177
10 <sup>th</sup> percentile	77	150	150	75	150
30 <sup>th</sup> percentile	350	900	800	320	855
50 <sup>th</sup> percentile	1,000	2,500	2,200	1,000	2,500
70 <sup>th</sup> percentile	2,500	5,000	5,000	2,500	5,000
90 <sup>th</sup> percentile	6,250	11,000	10,200	6,250	10,800
Unsecured debt-income, for borrowers only (%)					
sample size	2,180	2,181	1,979	2,112	2,109
mean	10.96	18.51	15.32	10.02	16.44
10 <sup>th</sup> percentile	0.5	0.9	0.8	0.5	0.8
30 <sup>th</sup> percentile	2.0	3.8	3.4	1.9	3.7
50 <sup>th</sup> percentile	5.5	9.0	8.3	5.2	8.8
70 <sup>th</sup> percentile	11.9	18.4	16.3	11.1	17.4
90 <sup>th</sup> percentile	27.1	44.6	37.2	25.2	40.7

(a) The number of households with unsecured debt excludes families whose debt is only in the form of student loans or overdrafts. Debt and debt-income ratios are calculated excluding households with overdrafts or student loans, no matter if they have other type of instruments.

There are significant differences in the proportion of borrowers and average unsecured debt across households according to the age of the head of the household (referred to subsequently as the age of the household) and income<sup>9</sup>. Around 70% of households aged 16 to 30 years old had at least one form of unsecured debt in both 1995 and 2000 (see Table B). This fraction decreases with age to around 15% for households

6. The participation rate is 0.46 if households with overdrafts and student loans are excluded. But this figure is not totally relevant for the comparison since in 2000 we are excluding households with other types of instruments. At an individual level, 185 out of 459 individuals only hold debt in the form of overdrafts or student loans. Excluding households with no debt (apart from that on overdrafts or student loans) the proportion of borrowers is 0.48 in 2000.

7. If individuals cannot provide the exact amount they owe, they choose among some intervals. In particular, they are asked to indicate whether the amount they owe is more than £100, more than £500, more than £1,500, or more than £5,000. Depending on the case we assign a debt of £50, £300, £1,000, £3,250 or £7,000, to these cases respectively. This affects 310 individual borrowers (out of 6,889). In addition, if debt is a joint commitment we only assign half of the value. In 2000 which part of the debt is a sole commitment is known but we do not use this information since it is not available for 1995. Joint commitments affect 984 and 709 individuals out of 3,481 and 3,458 debtors in 1995 and 2000 respectively. Once the debt variable for each individual is built, a household variable is determined by adding up the debt of all members. For each year, all unsecured debt values above the 99<sup>th</sup> percentile are recoded to the value of the 99<sup>th</sup> percentile. This is also done for unsecured debt-income ratios.

8. If borrowers with overdrafts and student loans are excluded the median in 2000 is somewhat lower (£2,200).

9. We use the annual household income provided by BHPS scaled by a conversion factor taking into account the effects of household size and composition. Income groups are percentiles of the income distribution for the total sample in 1995. For 2000 the percentiles are updated using the Retail Price Index.

older than 60 years old. Comparing 1995 and 2000, the participation of younger households seems to be larger in 2000, although their contribution to aggregate debt is relatively small given their small and declining weight in the population (see last columns in Table B). Participation in the unsecured debt market is clearly higher for households with income above the median, with around 60% of them having some form of unsecured debt in 1995 and 2000.

**Table B: Proportion of borrowers and sample weights by age and income**

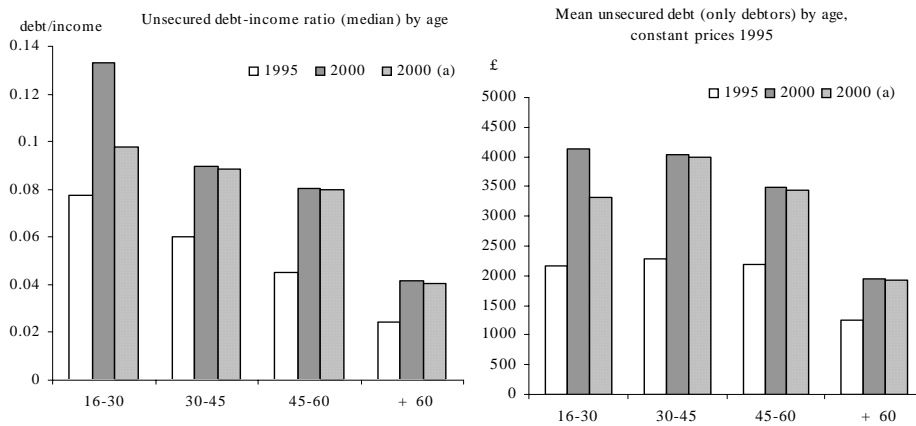
%	Proportion of borrowers					Sample weights of each age and income group	
	Total sample		Exc. new type of instruments	Excluding full-time students		1995	2000
	1995	2000	2000 (a)	1995	2000		
<b>age groups</b>							
16-30	67	75	73	70	73	18	16
30-45	65	64	64	65	64	29	30
45-60	55	52	51	55	52	22	25
60 +	14	16	15	14	16	29	28
<i>Total</i>	<i>48</i>	<i>49</i>	<i>48</i>	<i>48</i>	<i>48</i>	<i>100</i>	<i>100</i>
<b>income groups</b>							
below the 10 <sup>th</sup> percentile	38	38	33	35	28	10	7
10 <sup>th</sup> -30 <sup>th</sup> percentile	31	30	29	30	29	20	16
30 <sup>th</sup> -50 <sup>th</sup> percentile	45	42	41	45	41	20	22
50 <sup>th</sup> -70 <sup>th</sup> percentile	56	58	57	56	58	20	20
70 <sup>th</sup> -90 <sup>th</sup> percentile	61	60	59	61	60	20	23
above the 90 <sup>th</sup> percentile	60	57	56	60	57	10	12
<i>Total</i>	<i>48</i>	<i>49</i>	<i>48</i>	<i>48</i>	<i>48</i>	<i>100</i>	<i>100</i>

(a) Households with overdrafts or student loans and with no other type of unsecured debt are excluded.

As Cox et al. (2002) showed, the debt-income ratio is negatively related with age in both 1995 and 2000 (see Chart 1). Debt-income ratios increased for every age group between 1995 and 2000. The increase for the youngest is difficult to quantify due to the introduction of new categories of debt to the questionnaire and the change in method of student finance. The increase is smaller when families with either student loans or overdrafts are excluded from the analysis<sup>10</sup>. For those younger than 60, debt levels do not vary very much across age, in both 1995 and 2000.

10. Similar results are obtained when full-time students are excluded from the sample.

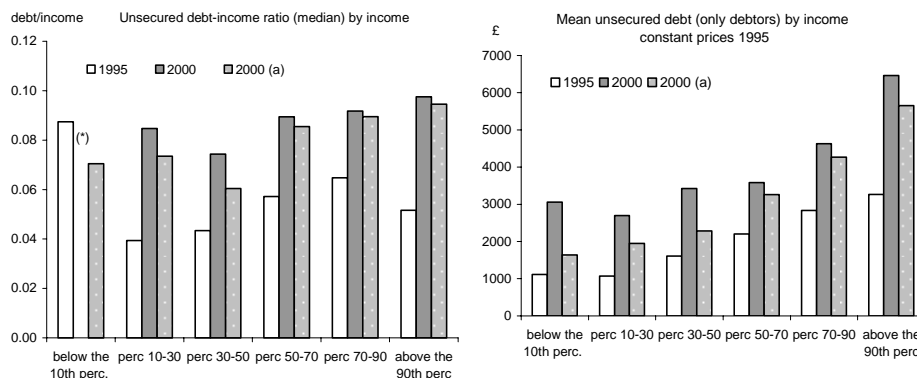
**Chart 1: Household unsecured debt and debt-income by age (of the head of the household)**



(a) Excluding all families with student loans and overdrafts.

The debt-income ratio is significantly higher than average for households below the 10<sup>th</sup> percentile in the income distribution in 1995 and much higher in 2000 (see Chart 2). The apparent change in the debt-income ratio between 1995 and 2000 is likely to be partly due to the change in the BHPS questionnaire and shift in the student finance regime. If all households with student loans and overdrafts in 2000 are excluded from the comparison, then the debt-income ratio for the lowest decile of the distribution actually falls between 1995 and 2000. When full-time students are excluded, (Chart 3) the increase in debt-income ratio for the lowest decile is similar to that of other income groups. The debt-income ratio in 1995 is slightly increasing between the 10<sup>th</sup> and 90<sup>th</sup> percentiles of the income distribution, but quite flat in 2000. Using the same real income thresholds, it is clear that the debt-income ratio increased between 1995 and 2000 for all income groups, with the sharpest increase for those between the 10<sup>th</sup> and 30<sup>th</sup> percentiles of the income distribution. It is interesting to note, however, that the weight of the lowest-income group fell considerably during that time as real income levels increased (Table B), the general increase in income being relevant in explaining the increase in aggregate debt levels.

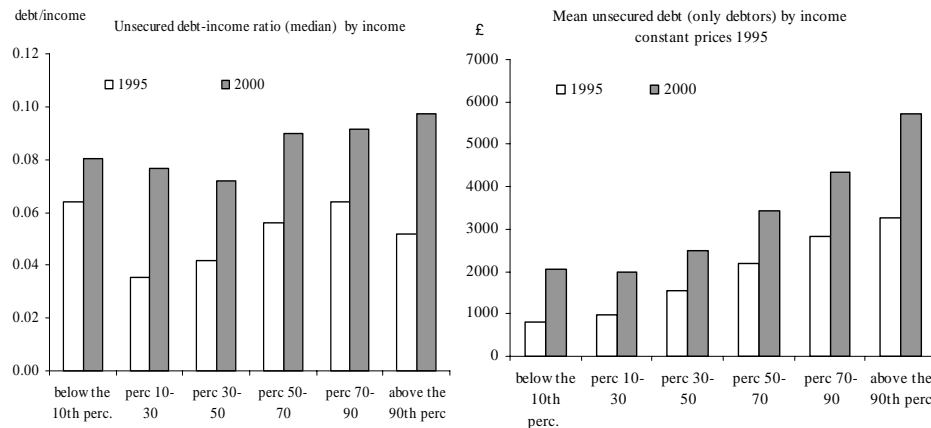
**Chart 2: Household unsecured-debt and debt-income by income**



(\*) Value excluded for 2000: 0.43

(a) excluding all families with student loans and overdrafts

**Chart 3: Household unsecured-debt and debt-income by income  
Excluding full-time students from the sample**



As noted earlier, the BHPS also provides self-reported information on the extent to which households consider their debt repayments to be a burden. They are first asked whether anyone in the household has to make repayments on hire purchases or loans, excluding mortgage loans but including DSS social fund loans. If the answer is 'yes'<sup>11</sup>, they are then asked 'to what extent is the repayment of such debts and the interest a financial burden on your household? Would you say it is a heavy burden, somewhat of a burden or not a problem?' In both 1995 and 2000 around 30% of the debtor households in the sample reported their unsecured debt repayments to be 'somewhat a burden', while a further 10% thought them a 'heavy burden'. We use this information as an indicator of financial distress.

As shown in Chart 4, debtors reporting such problems tend to have higher unsecured debt-income ratios throughout the household income distribution. In addition, mean (and median) unsecured debt-income ratios of those reporting financial problems are higher in 2000 than in 1995. The mean unsecured debt-income ratio of those reporting debt to be a heavy burden was 16% in 1995 and 26% in 2000. This may suggest that households perceived a given debt-income ratio to be less burdensome in 2000 than 1995. When all the sample is used in 2000, the debt-income ratio of those in the lowest income decile who consider their debt to be somewhat of a problem or no problem is very high. This is not significantly reduced if full-time students or those with overdrafts or student loans are excluded from the sample (lower panel of Chart 4).

11. In both 1995 and 2000, only 28% of households answered 'yes'. However, in the financial section of the questionnaire, which is made on an individual basis, around 48% of the sample reported to have at least one form of unsecured debt. This apparent contradiction suggests that the household respondent might not be aware of the debt of other members in the family. It could also be the case that different type of debts are taken under consideration when answering both questions. This is obviously a problem with survey data, and the following analysis has to be made on a reduced sample of household borrowers.

**Chart 4: Self-reported indicator of financial distress and debt-income ratios by income group**

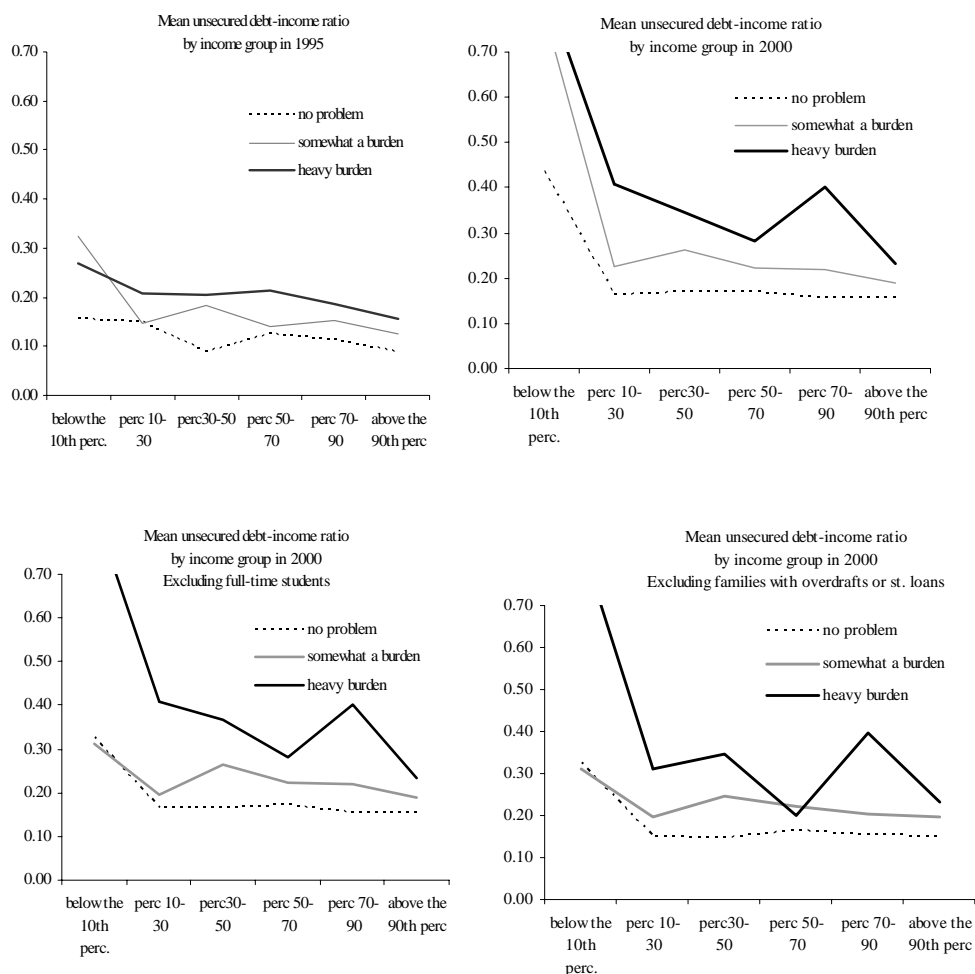
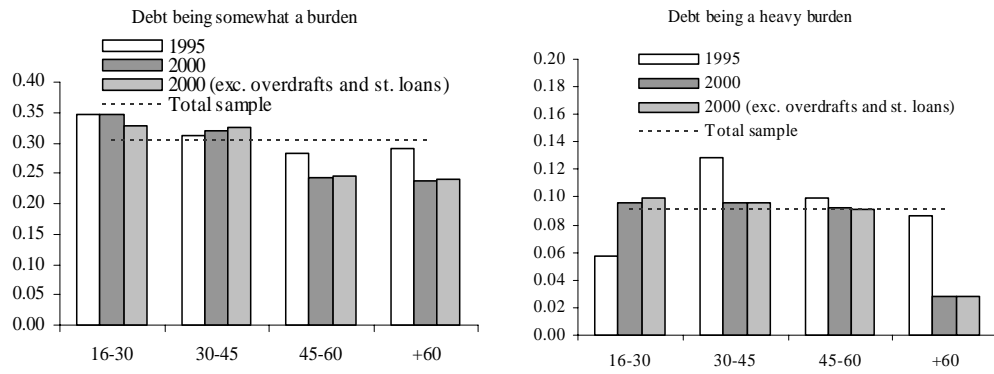


Chart 5 shows simple plots of the proportion of households reporting repayments to be a burden in different age groups. The proportion of households considering debt payments to be somewhat of a burden is slightly higher for younger households, both in 1995 and 2000. The difference across age groups widened between these years due to a fall in the proportion of households aged over 45 reporting that debt is somewhat of a burden. On the other hand, households considering debt a heavy burden were concentrated in the over 30 age groups in 1995. By 2000 however, there are no obvious differences across age groups except that a very low proportion of the oldest households reported debt to be a heavy burden. It appears then that those aged under 30 have become more concerned about debt, while those over 30 have become less concerned.

These changes in the perceived burden of debt are likely to reflect shifts in the amount of borrowing undertaken as well as changes in household circumstances. The next section assesses the relationship between the subjective burden of debt and its possible determinants.

Chart 5: Proportion of households under financial distress by age group





### 3 Relationship between indebtedness and the probability of debt being a problem

In this section, we analyse the factors that determine whether households are likely to report problems in paying their unsecured debt. To assess this, and to interpret the results, the analysis is carried out within the context of a heavily simplified framework that relates the self-reported burden of debt to household circumstances.

#### *A simple framework*

We presume that households consider their unsecured debts to be a burden if the repayments force them either to increase their borrowing or reduce their consumption below some comfortable level. By the household budget constraint, it is possible to state simple conditions that are useful in characterising payment problems. The constraint can be written in simplified form as:

$$c_t^i = y_t^i + D_{t+1}^i - (1 + r_t)D_t^i \quad (1)$$

where  $c$  is consumption,  $D$  is the stock of unsecured debt at the beginning of the period,  $y$  is total disposable income after mortgage interest payments and  $r$  is the interest rate on unsecured debt. Other assets and liabilities are assumed fixed in the short term. The amount of consumption that the household can afford without changing the stock of unsecured debt is  $y_t^i - r_t D_t^i$ .

It is assumed that debt becomes ‘somewhat’ of a problem for household  $i$  at date  $t$  when the amount of consumption that can be afforded without changing the stock of unsecured debt falls below some comfortable level,  $\tilde{c}_t^i$  and becomes a ‘heavy’ burden when it falls below a less comfortable level,  $\bar{c}_t^i$ . So, for household  $i$ , debt is a heavy burden if  $y_t^i - r_t D_t^i < \bar{c}_t^i$ , somewhat of a burden if  $\tilde{c}_t^i < y_t^i - r_t D_t^i < \bar{c}_t^i$ , and not a problem if income net of unsecured interest payments is greater than this level. Suppose that these levels depend on household characteristics as follows:

$$\bar{c}_t^i = (1 - \delta_t^i + \varepsilon_t^i) \bar{y}_t^i \quad (2)$$

$$\tilde{c}_t^i = \bar{c}_t^i - \delta_t^2 y_t^i \quad (3)$$

where  $\bar{y}_t^i$  is some measure of the household’s normal income,  $(1 - \delta_t^i)$  is the fraction of normal income that a representative household would regard as giving a comfortable level of consumption and  $\delta_t^2$  is the fraction of current income that would reduce consumption to such a level that debt becomes a heavy burden,  $\varepsilon_t^i$  is an individual specific factor that may be related to age and other household characteristics such as the number of children that makes the perceived comfortable level of consumption for a particular household differ from that of a representative household. Let  $\varepsilon_t^i = \alpha_t^i + u_t^i$ , where  $\alpha_t^i$  reflects observable household characteristics determining consumption needs and  $u_t^i$  is a set of unobservable factors that determine a household’s attitude to debt. These factors, including the ‘mood’ of the household on the day of the survey, capture the subjective nature of the survey, including any reporting errors.

Re-arranging these expressions, any household  $i$  at date  $t$  would state that debt is not a problem if

$$Z_t^i = r_t \frac{D_t^i}{y_t^i} + (1 - \delta_t^i) \left( \frac{\bar{y}_t^i - y_t^i}{y_t^i} \right) + \varepsilon_t^i \left( \frac{\bar{y}_t^i - y_t^i}{y_t^i} \right) + \alpha_t^i + u_t^i < \delta_t^i \quad (4)$$

that it is somewhat of a burden if

$$\delta_t^1 < Z_t^i = r_t \frac{D_t^i}{y_t^i} + (1 - \delta_t^1) \left( \frac{\bar{y}_t^i - y_t^i}{y_t^i} \right) + \varepsilon_t^i \left( \frac{\bar{y}_t^i - y_t^i}{y_t^i} \right) + \alpha_t^i + u_t^i < \delta_t^1 + \delta_t^2 \quad (5)$$

and is a heavy burden if

$$Z_t^i = r_t \frac{D_t^i}{y_t^i} + (1 - \delta_t^1) \left( \frac{\bar{y}_t^i - y_t^i}{y_t^i} \right) + \varepsilon_t^i \left( \frac{\bar{y}_t^i - y_t^i}{y_t^i} \right) + \alpha_t^i + u_t^i > \delta_t^1 + \delta_t^2 \quad (6)$$

In this simplified form, a household would report debt problems according to the value of a continuous latent variable  $Z$  relative to unobserved thresholds that are common to all households by design. The randomness in individual attitudes to debt is captured in the specification of the latent variable which is here determined by income gearing, normal income relative to current income and individual specific factors, related to observable as well as unobservable characteristics.

This type of model can be estimated in cross-section using an ordered-logit approach where the parameters to be estimated are the values of the common thresholds as well as any parameters determining the value of the latent variable. The dependent variable is the self-reported indicator of financial distress (*srifdi*). This variable takes the value 1 when the household reports no problem in meeting debt commitments, 2 when the household reports debt to be somewhat of a burden and 3 when debt payments are a heavy burden. The model we estimate is the following:

$$Prob[srifdi = j] = Prob(k_{j-1} \leq \beta'x_i + u_i \leq k_j) \quad j=1,2,3 \quad (7)$$

where  $\beta'x_i$  represents the observable determinants of the latent variable and  $k_j$  are the cut-off points with  $k_0 = -\infty$ ,  $k_1 = \delta^1$ ,  $k_2 = \delta^1 + \delta^2$ ,  $k_3 = +\infty$ . The variable  $u_i$ , representing unobservable differences across households in their attitude to debt, is assumed to be logistically distributed:

$$Prob(u_i \leq k_j) = \frac{\exp(k_j - \beta'x_i)}{1 + \exp(k_j - \beta'x_i)} \quad (8)$$

### Estimation

In estimating this model, we include as explanatory variables the level of unsecured debt, household income, age, employment status, mortgage income gearing, financial wealth as well as race, education, health and marital status indicators. The level of unsecured debt is captured by dummy variables reflecting the position of the household in the unsecured debt-income distribution. We use dummy rather than continuous variables so as not to impose a particular functional relationship between the level of the debt-income ratio and the probability of reporting debt problems<sup>12</sup>. Income variables are also included separately so as not to restrict income to affect the reporting of debt problems only through the debt-income ratio: it is expected that those with higher income would be less likely to consider unsecured debt to be a problem for given levels of the debt-income ratio.

The job status of the head of household is included to take account of whether household income is considered to be different to normal. It might be expected that the current income of the unemployed is below normal, thereby raising the likelihood that debt is a problem for them.

We also include household tenancy status, and split up mortgage borrowers by their mortgage-income gearing level, expecting that those with high secured debt would be more

12. While the model outlined above explained debt problems in terms of the flow of debt interest payments relative to income, data is only available on the stock position. The stock and flow positions are likely to be very highly correlated without substantial variation across households in effective interest rates.

likely to report unsecured debt payment problems. The estimation also takes account of the financial wealth of the household. We also consider other personal characteristics of the head of the household (such as gender, age, race, education, marital status and number of children) and six regional dummies.

The sample includes all households with debt that provided information for the variables included in the regression. The pooled estimation covering 1995 and 2000 includes 1993 households. In the main estimation, each variable is interacted with an intercept dummy for 2000 so that comparisons of all the coefficients and statistical tests for the significance of differences can be made across the two years. In addition, the results of the pooled estimation without this interaction, except for the constant term, are provided. This reduces substantially the number of parameters to be estimated, but also imposes the assumption that these are constant across the two years. The thresholds for all dummy variables except that for financial wealth are kept at their 1995 real values so that coefficients are comparable across the two years.

<b>Table C: Ordered logit: self-reported indicator of financial distress</b>								
	<b>Estimation with 2000 year interactions</b>						<b>Pooled estimation</b>	
No.observations	1993						1993	
Chi2	366 chi2(83)						312 chi2(42)	
Prob>chi2	0.00						0.00	
Pseudo R2	0.13						0.11	
log likelihood	-1569						-1599	
							Interaction with 2000 year dummy	
<b>Variable</b>	<i>Coeff</i>	<i>std.error</i>	<i>Marginal Effect (a)</i>	<i>Marginal Effect (b)</i>	<i>Coeff</i>	<i>std.error</i>	<i>Coeff</i>	<i>std.error</i>
<b>Unsecured debt to income (by percentile)</b>								
between 10 <sup>th</sup> and 30 <sup>th</sup>	0.21	0.50	0.03	0.01	0.36	0.95	0.15	0.41
between 30 <sup>th</sup> and 50 <sup>th</sup>	0.42	0.49	0.06	0.01	0.40	0.91	0.30	0.40
between 50 <sup>th</sup> and 70 <sup>th</sup>	0.66	0.48	0.10	0.02	0.58	0.90	<b>0.65</b>	0.40
between 70 <sup>th</sup> and 90 <sup>th</sup>	<b>1.04</b>	0.49	0.17	0.04	0.24	0.90	<b>0.89</b>	0.39
larger than the 90 <sup>th</sup>	<b>1.60</b>	0.50	0.27	0.09	0.39	0.91	<b>1.52</b>	0.40
<b>Age</b>								
aged 30 to 45	<b>0.43</b>	0.18	0.06	0.01	<b>-0.56</b>	0.26	0.17	0.13
aged 45 to 60	<b>0.50</b>	0.22	0.08	0.02	<b>-0.82</b>	0.33	0.12	0.16
aged 60 or more	-0.37	0.55	-0.05	-0.01	-0.61	0.73	<b>-0.56</b>	0.35
<b>Qualification</b>								
Medium	0.10	0.16	0.01	0.00	<b>-0.57</b>	0.22	<b>-0.20</b>	0.11
Low	<b>0.56</b>	0.22	0.09	0.02	<b>-0.93</b>	0.36	0.17	0.17
<b>Income (by percentile)</b>								
less than 10 <sup>th</sup>	0.19	0.35	0.03	0.01	<b>-1.26</b>	0.72	-0.07	0.29
between 10 <sup>th</sup> and 30 <sup>th</sup>	0.07	0.28	0.01	0.00	0.63	0.42	0.31	0.21
between 30 <sup>th</sup> and 50 <sup>th</sup>	0.11	0.21	0.02	0.00	0.18	0.31	0.20	0.15
between 70 <sup>th</sup> and 90 <sup>th</sup>	-0.02	0.20	0.00	0.00	-0.07	0.28	-0.05	0.14
above the percentile 90 <sup>th</sup>	-0.05	0.27	-0.01	0.00	<b>-0.80</b>	0.38	<b>-0.45</b>	0.18
<b>Job status</b>								
Self-employed	<b>-0.55</b>	0.25	-0.06	-0.01	0.53	0.34	<b>-0.31</b>	0.17
Unemployed	<b>0.89</b>	0.38	0.14	0.03	-0.71	0.64	<b>0.63</b>	0.29
Retired	0.79	0.58	0.13	0.03	-0.46	0.74	0.44	0.34
Full-time student	0.24	0.53	0.03	0.01	-0.80	0.85	-0.15	0.42
Other	-0.13	0.29	-0.02	0.00	0.14	0.43	-0.09	0.21
<b>Housing Status</b>								
not owner	0.42	0.31	0.06	0.01	0.33	0.48	<b>0.50</b>	0.23
owner, income gearing<p25	-0.05	0.34	-0.01	0.00	0.41	0.51	0.09	0.25
between 25 <sup>th</sup> and 50 <sup>th</sup>	-0.13	0.34	-0.02	0.00	0.43	0.50	0.04	0.24
between 50 <sup>th</sup> and 75 <sup>th</sup>	0.37	0.31	0.06	0.01	0.16	0.49	<b>0.41</b>	0.24
larger than 75 <sup>th</sup>	<b>0.61</b>	0.33	0.10	0.02	0.12	0.50	<b>0.60</b>	0.24
<b>Financial Wealth</b>								
zero fin.wealth	<b>0.51</b>	0.19	0.08	0.02	-0.20	0.27	<b>0.41</b>	0.13
Fin wealth>median	<b>-0.67</b>	0.18	-0.08	-0.01	0.16	0.25	<b>-0.58</b>	0.12
<b>Personal Characteristics</b>								
poor health	<b>1.04</b>	0.29	0.17	0.04	-0.20	0.40	<b>0.90</b>	0.20
Minority ethnic	0.27	0.38	0.04	0.01	0.38	0.53	<b>0.45</b>	0.28
Female	0.07	0.20	0.01	0.00	-0.21	0.27	0.01	0.13
Divorced	<b>0.40</b>	0.25	0.06	0.01	0.49	0.34	<b>0.60</b>	0.17
widow/separated	0.21	0.44	0.03	0.01	-0.19	0.73	0.10	0.35
<b>Time effects and cut-off points</b>								
year 2000					-0.27	1.09	<b>-0.24</b>	0.10
k1	1.37	0.66					1.04	0.50
k2	3.65	0.66					3.25	0.51

Note: The sample includes all households with positive debt providing the necessary information for variables included in the regression. The reference group includes the lowest indebted households, younger than 30, with high qualifications, income between percentile 50<sup>th</sup> and 70<sup>th</sup>, employed, owners with no mortgage and with positive financial wealth but below the sample median. Percentiles values are calculated for the total sample. The regression includes 6 region dummies and other demographic variables such as gender, marital status and number of dependent children. Percentiles for the debt ratio are calculated for 1995 and they are, respectively, 0.5%, 2%, 5.5%, 12% and 28.2%. Income percentiles are, respectively, £6,032, £10,051, £15,531, £22,385, £37,022 in 1995. In 2000 they are updated with the RPI. Income gearing percentiles are 8%, 13%, 20%, in 1995, and 9%, 13%, 20% in 2000. For financial wealth median value corresponds to £2,750 in 1995 and £3,270 in 2000.

Table C lists the estimated coefficients  $\beta$ , the cut-off points  $k_1$  and  $k_2$  and the marginal effects. The final two columns are for the pooled estimation without interactions (except for the constant). The marginal effect of each characteristic on the probability of debt being reported to be either somewhat of a problem (column a) or a heavy burden (column b) are presented using the coefficients without the interaction for 2000. This estimation was also carried out excluding full-time students and the conclusions were qualitatively the same.

For the reference group, the probability of reporting debt problems is determined solely by the estimated value of the cut-off points,  $k_1$  and  $k_2$  (see bottom lines in the table). It is estimated that in 1995 the probability of a member of the reference group reporting no problems was 0.80, the probability of reporting that debt is somewhat of a burden was 0.18 and the probability of reporting it to be a heavy burden was 0.03<sup>13</sup>. These differences among the reference group in the probability of facing debt problems highlight the fact that even people with what appear to be the same economic circumstances can interpret those circumstances differently. It is reassuring though that the majority of people in the reference group would be expected to be in agreement on whether they faced debt problems or not.

The inclusion of a time dummy for 2000 makes it possible to test whether there is any evidence of a significant change between 1995 and 2000 in the likelihood of the reference group reporting financial distress. This term is significant in the pooled estimation that does not allow other coefficients to vary across the two years, suggesting that there was an easing of financial coefficients across these two years. But this decline is not evident once other interactions are allowed for. This suggests that there was a general decline in the likelihood of reporting financial distress between 1995 and 2000, but that it was more apparent for other groups than the reference groups. The most significant changes point to there being less financial pressure for those aged between 30 and 60, those without high qualifications and those at the extremes of the income distribution. This will be commented on further below.

#### *Unsecured debt-income ratio*

There is clear evidence that the likelihood of reporting difficulties with debt is monotonically increasing in the unsecured debt-income ratio<sup>14</sup>. According to the marginal effects, having an unsecured debt-income ratio between 12% (the 70<sup>th</sup> percentile) and 27% (the 90<sup>th</sup> percentile), rather than below 0.5% as for the reference group, would add 17 percentage points to the probability of unsecured debt being somewhat of a burden and 4 percentage points to the probability of it being a heavy burden. Thus, for a household with characteristics otherwise the same as the reference group, the probability of debt being reported to be somewhat of a burden would be 35% rather than 18%. The probability of it being reported to be a heavy burden would be 7% rather than 3%. For those otherwise like the reference group but having debt just above 28% of income (the 90<sup>th</sup> percentile), the probability of debt being reported to be a heavy burden would be around 12% and the probability of debt being reported to be somewhat of a burden would be around 45%. The interaction of debt-income ratio with a dummy variable for 2000 is not statistically different from zero, suggesting that the probability of reporting problems is virtually identical in both years for those with unsecured debt greater than around 12% of income. However, the general increase in indebtedness in Britain between 1995 and 2000 has raised the proportion of households in the highest debt group from 10% in 1995 to 20% in 2000. While this would tend to increase the

13. That is, the probability of no problem for the reference group is given by  $\exp(1.37)/(1+\exp(1.37))$ .

14. The fact that debt problems are generally increasing in the debt-income ratio suggests that there are no clear thresholds for this ratio which, once crossed, move a household from one state to another. If this were the case, the coefficient on debt-income ratios below the threshold would be small and insignificant, only becoming large and significant for those above the threshold. In this way the probability of facing debt problems would move from close to zero to close to one as the threshold were crossed. Instead, it is likely that the level of any such thresholds vary by household. In this sense the appropriate information is the proportion of households of a particular type that would face debt problems with debt-income ratios above a particular threshold.

proportion of the population reporting some kind of debt problem, this is being offset by a lower propensity to have debt problems induced by other variables.

#### *Income effects*

There are a number of ways in which income levels affect the likelihood of reporting debt problems. Incomes enter indirectly via the unsecured debt-income ratio and the mortgage income gearing terms and also directly through the income percentile terms. None of the latter are significant in the basic specification. But there is evidence that some of the direct income effects were significant in 2000: an income level below the 10<sup>th</sup> percentile and above the 90<sup>th</sup> percentile reduced the probability of debt being somewhat of a burden (relative to income between the 50<sup>th</sup> and 70<sup>th</sup> percentiles) by 12 and 9 percentage points, respectively. In the first case this is likely to be associated with the number of low income students with high debt income ratios who do not find debt to be a burden. In the second case, it suggests that a given unsecured debt-income ratio is less onerous for people with high incomes. While this effect is plausible and consistent with the theoretical model, it is not clear why it was not apparent in 1995.

#### *Job status*

Being unemployed adds significantly to debt problems, while the self-employed, who may require debt for their business, find debt to be less of a problem than others with similar characteristics. Both of these effects are less apparent in 2000 than in 1995, but the change is not statistically significant.

#### *Housing status and mortgage debt*

Housing status is expected to affect the likelihood of reporting debt problems through two channels. First, those with mortgage debt face an additional drain on their resources, tending to make it more likely that they will face debt problems. Second, those who own their own house will tend to be able to borrow on better terms than those in rented accommodation, tending to make it less likely that they will face debt problems. The first effect seems to be present in the data to some extent. The likelihood of reporting unsecured debt problems is increasing in the level of mortgage income gearing. Having mortgage interest gearing above 20% (the top quartile of the distribution) adds 10 percentage points to the probability of finding unsecured debt to be somewhat of a burden. On the other hand those who are not owners and might be paying rent also seem more likely to consider debt a problem, although the results are statistically significant only for the pooled estimation.

#### *Financial assets*

Having financial assets contributes to a lower probability of reporting debt problems, although the effect is not quantitatively very large. Having financial assets above the median of £2,750 and £3,270 in 1995 and 2000, respectively, reduced the probability of reporting any debt problems by 8 percentage points.

#### *Household characteristics*

Demographic and other more permanent household characteristics also affect the likelihood of reporting debt problems. The reference group contains households headed by those aged under 30. In 1995, those between 30 and 60 were more likely to report that debt was a burden, other things equal. This would suggest that young people had a more relaxed attitude to debt than their elders. This relative effect is not evident in 2000, suggesting that attitudes to debt are not related to age for those under 60. The reduction between 1995 and 2000 in the propensity to report debt problems among the over-30s is one of the more

significant changes highlighted by this analysis. The evidence also suggests that being divorced, non-white or in poor health are positively linked to the likelihood of reporting debt problems.

#### *Goodness of fit*

An overall measure of the goodness of fit of the model is the number of responses that are correctly classified according to whether they report debt problems or not. We classify responses according to the predicted probability that debt is not a problem for each household. If this predicted probability is greater than 0.55, then we classify the household as not having a problem, if it is between 0.25 and 0.55 we classify it as having somewhat of a burden and if it is less than 0.25 we classify it as having a heavy burden. The probability thresholds are chosen to match the overall proportions in the three categories of attitudes to debt.

**Table D: Goodness of fit**

	predicted and correctly classified		people wrongly classified		total
		%		%	
No problem	881	75	290	25	1171.0
Somewhat a problem	278	44	355	56	633.0
Heavy problem	80	42	109	58	189.0
<b>Total</b>	<b>1239</b>	<b>62</b>	<b>754</b>	<b>38</b>	<b>1993.0</b>

Notes: Responses classified according to the predicted probability of debt not being a problem (prno). No problem if  $prno > 0.55$ , somewhat of a problem if  $0.55 > prno > 0.25$  and a heavy burden if  $prno < 0.25$ .

Table D shows that 62% of households are classified correctly on this basis. This varies according to the classification. By construction, the model classifies about 60% of households as not reporting a problem. This is correct for 75% of these households, but 25% of them claim to have a problem with debt. At the other extreme, about 10% of households are classified as finding debt to be a heavy burden. This classification is correct for 42% of these households, but 58% of them deny that debt is such a problem. As would be expected in a model with statistically significant coefficients, these classifications are substantially better than would be obtained if households were classified randomly. In that case the proportions correctly classified would be approximately 60%, 30% and 10% for the not a problem, somewhat of a burden and heavy burden categories respectively. The errors reflect the point made earlier that even people with the same observed circumstances have different attitudes to debt. The important point is that the econometric analysis is able to distinguish the economic characteristics of debtors that contribute to the reporting of debt problems.

#### 4 Overindebtedness and the role of financial surprises

The significance of the coefficients and the size of the marginal effects in the preceding estimation results points to debt-income ratios as the main variables explaining differences among households in the probability of reporting debt repayment problems. But there is likely to be a difference between those households whose financial circumstances are turning out as planned and those who have faced unpleasant financial surprises. To test the role of negative financial surprises in causing debt payment problems, we add to the previous model a variable that takes account of whether a household has had an adverse financial surprise. This variable has previously been used by Böheim and Taylor (2000) in their study of housing payment problems. It consists of the difference between the reported change in the financial situation of a household in a particular year and the expected change in the financial situation for the forthcoming year as reported in the previous year. We assume that a household has suffered a negative financial shock if the expected change in the financial situation was better than the actual change reported one year ahead. The variable for financial surprises is interacted with the unsecured debt-income ratio and we include contemporaneous and lagged values. Specifically, for those with debt-income ratios above the 70<sup>th</sup> percentile: those not affected by negative financial shocks in the past two years, those who experienced a financial shock in one year or the other and those who experienced a shock in both years. Because the household needs to be observed in the two previous years, the sample is reduced to 838 and 871 households in 1995 and 2000 respectively.

The inclusion of the financial surprise variable leads to some modification of the previous results. In particular there is evidence that having a high unsecured debt-income ratio is not sufficient to raise the probability of reporting debt problems for certain levels for debt. The pooled estimation shows that those with debt-income ratios between the 70<sup>th</sup> and 90<sup>th</sup> percentiles only had a significantly higher probability of reporting debt problems if they had also suffered a negative financial surprise in the current or previous period (see Table E). The coefficients of the other variables included in the equation (not shown in Table E) do not show large changes, although unemployment and the dummy variable for households with the largest mortgage income gearing reduce their significance when introducing negative financial shocks. This suggests that these variables might be picking up the effect of an adverse financial shock. When variables are interacted with the 2000 dummy variable the standard errors of the estimation increase significantly and the differences between 1995 and 2000 are not statistically significant.

The importance of these results is that they show that the likelihood of reporting debt problems is greater when high debt-income ratios are combined with negative financial surprises. This indicates that unsecured debt raises the *vulnerability* of households to adverse shocks.



Table E: Ordered logit including financial surprises

	<b>Pool estimation</b>		<b>2000 year interaction</b>			
<i>No.observations</i>	1703		1703			
<i>chi2(95)</i>	302		359			
<i>Prob&gt;chi2</i>	0.00		0.00			
<i>Pseudo R2</i>	0.12		0.13			
<i>log likelihood</i>	-1337		-1312			
					Interaction with dummy for year 2000	
<b>variable</b>	<i>Coeff</i>	<i>std.error</i>	<i>Coeff</i>	<i>std.error</i>	<i>Coeff</i>	<i>std.error</i>
unsecured-debt to income						
between perc. 10th and 30th	-0.17	0.36	0.01	0.57	0.69	0.95
between 30 <sup>th</sup> and 50 <sup>th</sup>	0.29	0.35	0.35	0.55	0.30	0.91
between 50 <sup>th</sup> and 70 <sup>th</sup>	0.39	0.34	0.43	0.54	0.86	0.90
between 70 <sup>th</sup> and 90 <sup>th</sup>						
no neg shock	0.41	0.36	0.64	0.57	0.41	0.92
neg surprise (t-1)	<b>0.67</b>	0.41	0.86	0.63	0.08	1.00
neg surprise	<b>1.25</b>	0.37	<b>1.04</b>	0.62	0.41	0.99
neg surprise (t) and (t-1)	<b>1.71</b>	0.42	<b>1.62</b>	0.65	0.54	1.04
larger than the perc.90 <sup>th</sup>						
no neg shock	<b>1.03</b>	0.40	0.87	0.60	0.57	0.95
neg surprise (t-1)	<b>1.27</b>	0.46	1.07	0.68	0.92	1.05
neg surprise	<b>1.94</b>	0.45	<b>2.03</b>	0.67	0.31	1.00
neg surprise (t) and (t-1)	<b>2.22</b>	0.47	<b>2.57</b>	0.81	0.29	1.11

## 5 Distribution of estimated probabilities by income and age groups

The estimated relationships described above show the influence of different factors on the likelihood of reporting debt problems and how they have changed over time. In this section we look at the probability of debt problems being reported for different groups of households, taking account of their different circumstances but not allowing for unobserved individual effects. By stripping out the individual effects, it is possible to show on a standardised basis where in the population debt problems are most likely to be reported.

Table F shows mean *predicted* probabilities of reporting debt problems by age and income group taking account of the actual circumstances of those in each group. In general, debt problems are most likely to be reported among households headed by 30-45 year olds towards the lower end of the income distribution. In both 1995 and 2000 households headed by 30-45 year olds with income between the 10<sup>th</sup> and 30<sup>th</sup> percentiles of the income distribution had a 45% chance of reporting that unsecured debt was somewhat of a burden and over a 20% chance that they would consider it a heavy burden. While the likelihood of reporting debt problems is smaller at higher income levels, the chances of debt being considered a problem are not negligible. The main change between 1995 and 2000 is that debt is estimated to be seen as less of a problem by those in the bottom decile of the income distribution. This is a puzzle that arises out of the estimation results and is a reflection of the change in attitudes towards debt of those with low incomes. Note that this is unlikely to reflect the effect of student debt as it is apparent across all age groups at low incomes<sup>15</sup>. Otherwise, the main difference between 1995 and 2000 is that the likelihood of reporting debt problems has increased for the under-30s at all parts of the income distribution apart from those in the highest and lowest income deciles. For older households and those in the upper and lower tail of the income distribution there is an estimated reduction in the probability of facing debt problems in spite of the increase in their indebtedness.

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15. The table is also calculated excluding full-time students from the sample and changes are minor.

**Table F: Estimated probabilities by income and age groups**

	Estimated probabilities							
	Debt being somewhat a burden				Debt being a heavy burden			
	1995		2000		1995		2000	
	mean	std.dev	mean	std.dev	mean	std.dev	mean	std.dev
<i>income &lt; perc10th</i>								
<i>age -30</i>	0.46	0.07 **	0.30	0.14	0.22	0.13 **	0.06	0.04
<i>aged 30 to 45</i>	0.47	0.05 **	0.31	0.14	0.29	0.14 **	0.08	0.07
<i>aged 45to 60</i>	0.44	0.13	0.27	0.33	0.33	0.26	0.15	0.21
<i>aged +60</i>	0.39	0.06			0.09	0.03		
<i>p10 &lt; income &lt; p30</i>								
<i>age -30</i>	0.40	0.09	0.41	0.09	0.12	0.08 **	0.23	0.20
<i>aged 30 to 45</i>	0.45	0.07	0.46	0.07	0.21	0.14	0.24	0.15
<i>aged 45to 60</i>	0.39	0.11	0.44	0.09	0.14	0.14 *	0.24	0.15
<i>aged +60</i>	0.34	0.13	0.31	0.10	0.10	0.09	0.07	0.05
<i>p30 &lt; income &lt; p50</i>								
<i>age -30</i>	0.38	0.10 **	0.42	0.08	0.13	0.13	0.15	0.11
<i>aged 30 to 45</i>	0.39	0.11	0.41	0.10	0.14	0.11	0.15	0.11
<i>aged 45to 60</i>	0.39	0.12	0.36	0.13	0.13	0.11	0.12	0.11
<i>aged +60</i>	0.33	0.10 **	0.22	0.11	0.09	0.08 **	0.04	0.03
<i>p50 &lt; income &lt; p70</i>								
<i>age -30</i>	0.31	0.11 **	0.37	0.10	0.07	0.04 **	0.12	0.11
<i>aged 30 to 45</i>	0.34	0.11	0.36	0.10	0.09	0.07	0.09	0.06
<i>aged 45to 60</i>	0.32	0.12	0.29	0.13	0.08	0.08	0.07	0.07
<i>aged +60</i>	0.23	0.12	0.16	0.08	0.04	0.03	0.02	0.02
<i>p70 &lt; income &lt; p90</i>								
<i>age -30</i>	0.25	0.11 **	0.35	0.13	0.05	0.04 **	0.10	0.07
<i>aged 30 to 45</i>	0.31	0.12	0.30	0.12	0.09	0.09	0.07	0.07
<i>aged 45to 60</i>	0.28	0.12 **	0.23	0.11	0.06	0.05	0.05	0.05
<i>aged +60</i>	0.17	0.08	0.17	0.16	0.03	0.01	0.04	0.06
<i>income &gt; p90</i>								
<i>age -30</i>	0.20	0.11	0.19	0.09	0.04	0.03	0.03	0.02
<i>aged 30 to 45</i>	0.25	0.11 **	0.20	0.12	0.05	0.04	0.04	0.04
<i>aged 45to 60</i>	0.23	0.11 **	0.15	0.11	0.04	0.04 *	0.03	0.04
<i>aged +60</i>	0.29	0.18 **	0.06	0.01	0.06	0.05 *	0.01	0.00

Note: Mean and standard deviation of fitted probabilities by income and age group are calculated. The symbol (\*\*)/(\*) indicates whether the difference between the mean in 1995 and the mean 2000 is statistically different from zero at 5%/10%.

## 6 Conclusions

According to the BHPS the average level of unsecured debt held by borrowers almost doubled between 1995 and 2000. Despite this, the proportion of households reporting that unsecured debt is somewhat of a burden or a heavy burden did not change between these two years. Is it possible to reconcile these disparate trends?

One possible reconciliation is to argue that self-reported indicators of the burden of debt are entirely subjective and bear little relation to objective reality. As such, it would not be surprising for the perceived burden of debt to be unrelated to increased indebtedness. This argument is not correct though, as we are able to reject the hypothesis that our subjective measures of the burden of debt are entirely random. Instead, our estimates show a systematic relationship between the perceived burden of debt and a range of determining factors.

These estimates, derived from an ordered-logit model of the probability of reporting debt problems, suggest that the main determinant of debt problems is the unsecured debt-income ratio. There is no clear point at which debt becomes a problem, but our analysis suggests, for example, that having an unsecured debt-income ratio above 12% (the 70<sup>th</sup> percentile of households with any debt) adds at least 17 percentage points to the probability of unsecured debt being somewhat of a burden and 4 percentage points to the probability of it being a heavy burden compared to households without any debt. Nevertheless, our estimates also show a general softening in attitudes towards debt, since the higher debt-income ratios observed in 2000 do not lead to an increasing likelihood of reporting debt to be somewhat of or a heavy burden.

Other than the unsecured debt-income ratio, the most important factors affecting the likelihood of a household reporting debt to be somewhat of a burden in 2000 are the level of mortgage income gearing, the level of financial wealth of the household, their health, ethnicity and marital status. Having mortgage income gearing above 20% of income adds about 9 percentage points to the probability of reporting debt to be somewhat of a burden. Being unemployed is also associated with a higher probability of reporting debt problems.

While the proportion of households reporting debt problems did not change between 1995 and 2000, there are important shifts among different groups. In particular, more households in the youngest age group report debt repayments to be a heavy burden in 2000, while the opposite applies to the oldest age group where a smaller proportion of households report debt to be a heavy burden than in 1995. By income group, the main change is a sharp fall in 2000 in the proportion of very low income households who report that debt is a heavy burden.

The paper shows that these changes can largely be accounted for by the changing economic circumstances of different groups rather than an unrelated shift in attitudes. The increase in the median debt-income ratio of the young from just under 7.7% in 1995 to a level between 10% and 14% in 2000 is the main factor accounting for their greater tendency to report debt problems.

These estimates are used to predict the probability that an individual household will report that it faces debt problems. When the mean predicted probabilities are calculated for different age and income groups, it is found that the households with the largest probability of reporting problems tend to be young and at the lower end of the income distribution. This reflects the fact that young households are more likely to participate in the unsecured debt market and have higher debt-income ratios. Moreover, comparing 1995 and 2000, it is the younger and less well-off households whose probability of facing debt problems has

increased. While any given level of indebtedness is less problematic in 2000 than in 1995, the increased quantity of unsecured debt taken on by these groups means that they are more likely to face problems and be vulnerable to potential shocks in their income and interest rates. Moreover the evidence suggests that the likelihood of reporting debt to be a burden is increased for high debt-income households who have also experienced an adverse financial shock. This suggests that while the greater indebtedness of British households in 2000 had not raised the perceived burden of debt, some of them are more vulnerable to adverse economic shocks should these occur in the future.

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