

HOUSEHOLD DEBT AND ARREARS: WHAT ROLE DO INSTITUTIONS PLAY?*

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Abstract

Despite the heightened debate on rising household debt, personal bankruptcy filings, and arrears, household debt repayment behaviour has been understudied, especially at the empirical level. This paper uses data from the European Community Household Panel to analyze the determinants of household debt arrears. The paper's primary aim is to understand the role of institutions in household arrears by exploiting cross-country differences and the panel nature of the data set. We first analyze how the incidence of arrears is affected by adverse events, while controlling for other observable demographic characteristics, and unobservable factors by using a random effects estimator. We then show how the effects of the adverse events themselves vary across countries, depending on local financial and judicial institutions, which captures the differences in punishment and cost of default. We find that adverse events are important, and the extent to which they matter depends on the punishment associated with default.

Keywords: Households Borrowing, Arrears, Institutions

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1 Introduction

Almost nothing is known about households' debt repayment behavior and the incidence of arrears, even in the US and the UK where household debt and default has been growing rapidly. This is despite the heightened debate on the subject in the press and among policy makers, many of whom believe that there is a credit crisis. For example, the Governor of the Bank of England warned in May 2006 that "spiralling levels of personal debt are a 'potentially large social problem' ".¹

Which households get into repayment difficulties? Among seemingly similar households, why do some repay their debts and others default? How do policies and institutions affect debt, repayment, and arrears? These are just some of the interesting questions that need to be understood if economists are to contribute to the public discussion. These questions are also relevant from a strictly economic perspective. They shed light on household behaviour, their ability to smooth consumption against various shocks, and overall implications of household behaviour for macroeconomic outcomes.

Using data from the European Community Household Panel (ECHP), this paper analyzes the determinants of household debt arrears. The paper's primary aim is to understand the role of institutions in household arrears by exploiting cross-country differences and the panel nature of the data set. We describe how the propensity to "default" differs across countries and then explain this variation by the differences in national institutions.

Many commentators view default as the consequence of a genuine inability to repay. That is, the household's decision to default is affected by adverse events such as earnings or employment shocks, health problems, and divorce. However, in the macroeconomics literature, the decision to default is modeled to depend on how it is punished (e.g. the cost of default, including legal costs and the consequences of autarky). In papers by Kocherlakota (1996), Kehoe and Levine (2001), Athreya (2002), and Chatterjee et al. (2005), households compare the punishment for default with the benefit from reneging on their debts and do not pay if it is advantageous not to do so.

Relatively few studies, however, analyze the empirical determinants of default, perhaps due to the lack of suitable data. Nevertheless, Fay et al. (2002) used the PSID to ana-

¹Reported in the Daily Telegraph, 12 May 2006.

lyze the bankruptcy decisions of US households, while Gross and Souleles (2002) explored the administrative data from credit card accounts. Although both studies made key contributions, the PSID has rather few observations for bankruptcy, a low-probability event. Administrative credit card data have little information about some potentially important variables, such as changes in employment status, and are not representative of the overall population.

Several UK studies have exploited the British Household Panel Survey to investigate financial difficulties, debt burden, and the evolution of debt problems. Both Boheim and Taylor (2000) and May and Tudela (2005) studied housing evictions, while May, Tudela, and Young (2004) looked at unsecured credit. Bridges and Disney (2004) use data from the Survey of Low Income Families to examine use of credit, default, and arrears among low income families with children; the households that often particularly concern policy makers.

This paper uses the ECHP, which has several unique advantages. First, the ECHP provides nationally representative data for 14 EU countries, facilitating cross-country comparisons and enabling us to assess the role of institutions. Second, instead of analyzing bankruptcy—a low probability event that is really a legal status—we use data on household arrears to analyze household debt repayment behavior. After all, relatively few households that default on their debts become bankrupt. Third, the panel nature of the data allows us to incorporate unobserved differences among households' willingness to default and also to carry out a dynamic analysis. Finally, the data provide separate information on arrears on mortgages, which are collateralized, and arrears on unsecured loans. This opportunity helps us see how different contracts might explain why households choose to repay some loans and not others.

We begin by analyzing how the propensity to fall into arrears is affected by adverse events, while controlling for other observable demographic characteristics. We then show how the responses to these adverse events vary across countries, and that these responses depend on local financial and judicial institutions. Previous studies have emphasized the role of institutional arrangements in credit availability and the general development of financial markets. Examples include La Porta et al. (1998), Jappelli and Pagano (2002), Guiso et al. (2004) and Jappelli et al. (2005). However, institutions will only affect credit

availability (lenders will only restrict lending) if they influence the repayment behaviour of borrowers should their credit application be approved. To our knowledge, this paper is the first to study the implications of these institutions on arrears. The only close paper in this sense is by Grant and Padula (2005) which emphasizes the role of informal markets in explaining household debt repayment behaviour using administrative data from a leading Italian consumer credit company.

Our preliminary results show that in almost all cases households are more likely to be in arrears if they have suffered some adverse event, such as a significant fall in their income. However, there are significant differences in how households in different countries react to these shocks, and these differences seem to be related to the different institutional arrangements that exist in each country. These findings indicate that although adverse events are important determinants of arrears, the extent to which they matter depends crucially on how effectively default can be punished.

2 Data

2.1 The European Community Household Panel

This paper uses data from the European Community Household Panel (ECHP). The ECHP is a nationally representative panel of households in each of the 15 countries then in the European Union, collected between 1994–2001 (when collection of the data was discontinued). The survey asks questions about various demographic characteristics and the income of the household members. Additionally, the survey also includes information on households' debts and arrears. In particular, it asks whether the household has any housing debts, and whether the household is repaying any non-housing debts (such as a loan or hire purchase agreement). Our key variable of interest is provided by the question on whether the household has been unable to make a scheduled loan payment during the last 12 months.²

There are a number of advantages in using our survey as discussed in the introduction. The data is nationally representative, and moreover, since the same questions were asked

²The survey specifically asked whether the household has been unable to pay scheduled rent, utility bills, mortgage payments, or other payments on non-housing debt.

in all EU countries, we can compare the behaviour of households across different countries. Secondly, the survey focuses specifically on arrears over the last 12 months. Few other surveys concentrate on arrears. For example, the 1996 wave of the PSID asked US households whether they had filed for bankruptcy - a fairly rare event. Fay, Hurst and White (2002) found that only around 250 households had filed in the period 1992-1995, less than one percent of the households that were reported. This suggests bankruptcy is under-reported in the PSID, since the rate in that survey is half the national filing rate. A more serious problem is that only a small proportion of accounts that become delinquent (in which households are more than three months in arrears) result in a filing for bankruptcy. While bankruptcy law sets the punishment for default and thus affects equilibrium behaviour, bankruptcy filings are not an accurate measure of default and/or repayment behaviour. Thirdly, the panel component of our data allows us to investigate the evolution of income, debt, and arrears for the same household over time. In particular, we can investigate how both the incidence of debt and of repayment (the obverse of arrears) evolves as the household experiences income and other types of shock, while also controlling for unobserved heterogeneity. Lastly, we can separately investigate both housing and non-housing debts.

However, some disadvantages remain: arrears are self-reported, which means they are likely to be under-reported (recall the low reported filing rate in the PSID). More seriously we do not know the length of arrears, nor do we know the level of debt. Despite these potential disadvantages, we believe that this data can be informative about arrears and household debt-repayment behaviour.

In constructing our sample, we include all households where the household head (defined as the male in couples) is between the ages of 30 and 60. We exclude households with multiple unrelated adults. We focus on income risk alone and so include only stable households even though divorce may be an important factor. Since we are interested in the behaviour of households over time we also exclude those households who are only observed once. We exclude the first wave, 1994, from the analysis, since some variables seem to be less well measured in this year. Sweden is excluded from the analysis as the key variables in our analysis were not asked to Swedish households. Income is expressed in real 1996 euros. The interest rate that is used in the regressions is the 3-month money market interest rate

in each country.

After these restrictions, we have over 140,000 observations (about 23,000 in each year and on average 10,000 for each of the 14 countries we include in the survey). The data is summarized in table 1. Around 80 percent of households comprised of married or cohabiting couples, with an average household size of 3.24 persons. The average age of the household head was 44, with a quarter of households having been to university and a further third having completed secondary school. The table shows that 55 percent of households had mortgage debts and that 30 percent of households had other debts. Moreover, around 3 percent of households reported arrears during the last 12 months. On average, each household's income had increased by 3 percent over the last year but nearly half of households had seen their real income decline.

Table 1 also describes some summary statistics for the sample of households who are borrowing. This sample is slightly smaller, at under 100,000. Moreover, the households in this sub-sample are on average better educated, more likely to be a couple, and are more likely to have children than the sample of all households. They are also more likely to own their own house, and are more likely to be employed.

To capture the significant differences across countries, table 2 reports the proportion of households with any debt and those who are in arrears conditional on having debt. The proportion of households with some debt is highest in Denmark, and the Netherlands and is lowest in Italy and Greece. This difference between the Northern countries and the Mediterranean is similar to the more limited results reported in Crook (2004) and Crook and Hochguetel (2006). The last three columns are the focus of this study, reporting the percentage of households who have missed any scheduled loan payment, mortgage payment, or non-housing debt payment, respectively. While the cross-country pattern no longer follows exactly the Northern-Southern divide, differences remain significant. Reported arrears on any loan are highest in Greece and Finland, followed by Ireland and Italy. While arrears on mortgages are quite low in France, arrears on non-housing debt, which is not collateralized, are over 6 percent. Moreover, while the Dutch are among the most indebted households, they seem to be the least likely to be in arrears.

2.2 Institutions

To understand and link these differences across countries, we follow the law and finance literature and use the following data as proxies for cost of “default”. Contract enforcement indicators measure the efficiency of the judicial (or administrative) system in the collection of overdue debt. These include the total number of procedures mandated by the law, the total number of calendar days it takes, on average, for dispute resolution and the cost of judicial proceedings. On information sharing, we also use a measure of “private credit bureau coverage” expressed as a percentage of the adult population, (e.g. it reports the number of individuals and firms listed in the respective registry with current information on repayment history, unpaid debts or credit outstanding). The construction methodology of all these variables is developed in Djankov et al. (2006), and the data are available at the www.doingbusiness.org website.

3 Econometric Methodology and Results

3.1 Some Preliminary Observations

Before the formal regression analysis, it is useful to look at some simple sample statistics for arrears, to investigate how arrears are related to income and other shocks, and how the responses to shocks differ between countries. Table 3 investigates the effect of home-ownership, and then of various shocks, on the incidence of arrears. The table looks at all arrears including arrears on mortgage and rent, utility bills and on financial loans (including hire purchase debts). On average nearly 8 percent of households are in arrears but this number is almost twice as high, at 9.36 percent, for renters compared to households that own their home. Obviously renters will not have mortgage arrears, but around 3 percent of home-owners are in arrears on their mortgage. For other financial debts, some 2.67 percent of renters are in arrears, but the number is substantially lower, at 1.64 percent, for homeowners. The table also shows that households are more likely to be in arrears on their other (non-housing) debts compared to their mortgage debts, which are collateralized.

The rest of table 3 looks at how households react to various types of shock. Comparing households who have lost their job to households who have not shows that such households

are around twice as likely to be in arrears. For any debt, 15 percent of recently unemployed households are in arrears compared with only 7.5 percent of households who did not lose their jobs. While the difference between the incidence of mortgage arrears is similar, the numbers are much larger for other debts: 3.95 percent of households who suffered unemployment shocks are in arrears compared to 2.06 percent for households who did not face any unemployment shock.

Similar results are obtained when comparing households whose real income fell to those whose real income did not fall. However the differences are much smaller compared to the effects of unemployment shock. Health shocks are also investigated, and the results are similar to the unemployment shock effects, where for each of the different types of debts, households with a negative shock are around 50 percent more likely to default than households who did not suffer the shock. As before, arrears are more likely for other debts than for mortgage debts.

Lastly the table compares households that have self-reported that their income situation is significantly worse than one year previously, and such households are three times more likely to have missed any scheduled payment on a debt than those households who believe their income situation is about the same as the previous year, or to have improved. These households are also more likely to be in arrears on their mortgage or on other debts.

3.2 The Regression Analysis

The set of independent variables included in the regression are age, age-squared, interest rate, logarithm of the household income in the previous period, and dummy variables indicating the marital status of the household head, the number of children in the household, whether the household owns their home, whether the household head is self-employed, as well as a full set of time dummies. Using age and time dummies precluded estimating cohort effects. The basic regression is reported in table 4. The first column only includes the household characteristics and shows the estimates from a random effects probit regression.

The incidence of arrears increases with age but falls with age-squared, where age is measured in decades. The coefficients imply that arrears are highest for households aged around 50, although the coefficients are not significant. Those households that own their

house are significantly less likely to be in arrears than households that are renting; the coefficient implies renters are four times more likely to be behind on their payments as households that own their home. Although this effect is very large, it is unsurprising since such households have an asset that could, in principle, be liquidated and used to repay the debts that the household has. The coefficient is significant at the one percent level. Couples are also less likely to be in arrears compared to singles, in fact, the effect is half as large as for home-owning. The coefficients imply that couple are around half as likely to be in arrears as other types of household. Having children also reduces the incidence of arrears. However, there is no significant difference in the repayment behaviour of the self-employed and of other types of household. As might be expected, the interest rate increases the incidence of arrears: a 1 percent increase in the interest rate increases the incidence of arrears by a third. Recall that this variable is measured using the country specific 3-month money market interest rate.

Lastly, log-income is highly significant in the regression. We measured income in the period prior to the current period (recall that the arrears question asks about arrears over the last year, hence we take income one year prior to the period covered by any possible arrears). Households that are initially poorer are significantly more likely to miss scheduled debt payments. This might not seem surprising, but it does require comment. One reason for arrears is that households find it difficult to repay their debts when some unforeseen adverse event occurs, hence we would expect households whose income is currently low to be more likely to miss their scheduled debt repayments. Moreover, households will only be in arrears on loans if they have borrowed in the previous period. One reason to borrow is to smooth consumption when income is temporarily low, hence we would expect households with low income in the period immediately prior to the current period (the question asks about arrears over the last year) to be in arrears more often simply because these households are more likely to borrow. In taking income one year prior to this, we hope we (at least partially) eliminate this effect; e.g. that temporarily poor households are more likely to borrow. Hence finding that poorer households are more likely to be in arrears is genuinely striking and need not be predicted from a strict interpretation of the life-cycle consumption model (if we have successfully measured income prior to the household contracting any

debts).

3.2.1 Arrears and Adverse Events

An important reason that households fail to repay their debts on schedule is that they have experienced some shock or adverse event. The rest of this paper is devoted to this issue. Throughout we often describe these changes in income as shocks, although we do not know whether the shocks were expected by the household, hence more properly they should be thought of as adverse events. Nevertheless, we will use both descriptions interchangeably in the text. The first two shocks we investigate are the percentage fall in income and a dummy for whether there has been a significant fall in income (defined as a fall of over 7.5 percent in real terms). Households which have been unfortunate may be less able or willing to repay their debts.³ Households may behave differently if the income changed in a way that was expected, something that we, unfortunately, can not observe. However, households are asked how their income situation compares with one year previously. We create a dummy that takes the value one if the reports that their income situation has clearly deteriorated over the last year and zero otherwise. This variable is likely to capture unexpected changes in income.

In the second column of table 4 we include the percentage fall in income that the household has experienced (with increases recorded as zero). We would expect household to be more likely to be in arrears as they progressively experience larger falls in income but households might be expected to repay their debts on schedule both if their income has stayed the same and if it has increased. The results show that the household characteristics included in the first column is mostly unchanged, and that the shock, or adverse event, has increased the incidence of arrears. In the fourth column the shock or adverse event is a dummy for the household's real income has fallen significantly, while column (6) shows the effect of reporting a worsening income situation. The results are very similar in both cases. As expected, households who have had an income shock are significantly more likely to be in arrears. However, the estimated effect in column (6) is around 50 percent larger than

³Indeed it could be socially optimal to allow these households to default in response to an unexpected fall in income if other risk-sharing or insurance mechanisms are not available to such households.

that in column (4).

In the third, fifth and seventh columns of table 4 the shock is interacted with country dummies. Since each regression is estimated by random effects probit, households in different countries can have different propensities to fall behind on their repayments (these country fixed effects will not be separately identified from the household effects). The results show that there are significant differences in how households in each of the countries reacts to the different shocks. For example, when considering the fall in income (column 3), households in Ireland and Belgium are the most likely to react by falling into arrears, while households in the Netherlands and Portugal and Austria are the least likely to respond by ending up in arrears. A similar pattern can be seen for the other two shocks we investigate: in column (5) and (7) Greek, French, and Belgian households are the most likely to react to the adverse event by missing debt repayments. The last row reports the test statistic for whether these responses differ across countries, and we find that the differences are highly significant in all cases.

3.2.2 Mortgage Arrears and Arrears on Other Debts

Table 5 looks at mortgage arrears. The table shows that arrears increase with age and decrease with age-squared. This time the coefficients are highly significant, and imply that arrears peaks when the household head is around 44. Having children and being self-employed also increase the incidence of mortgage arrears, but single households and couples are equally likely to be in arrears. The table also shows that households that were initially poor are less likely to be in arrears, and that arrears are more likely as the interest rate rises. Columns (2), (4) and (6) all show that arrears are more likely when the household experiences some adverse event. Moreover, the differences across countries in how these households react to these adverse events (given in columns 3, 5 and 7) are highly significant.

Arrears on other financial loans are reported in table 6. The results show that age has no effect (neither age nor age-squared are significant) but couples and home-owners are much more likely to be in arrears. Having children, however, significantly increases the incidence of arrears. In the table, self-employed households are not significantly different from other households, but initially poor households are much more likely to miss scheduled repay-

ments. Again, higher interest rates are associated with higher rates of arrears. The three different shocks all increase arrears, but notice that the implied coefficient is smaller than for mortgage arrears. Nevertheless, households that experience an adverse event frequently respond by falling behind on the repayment of their consumer loans. Columns (3), (5), and (7) show that there are significant differences in how households respond to these shocks in different countries.

3.2.3 Arrears and Institutions

These differences between the effect of the shocks in different EU countries, reported in tables 4-6, seem large and significant. A primary aim of this study is to explain at least some of this variation: why should households with similar shocks be so much less likely to make their scheduled debt payments in Greece than in the Netherlands? Why do seemingly similar households, that have suffered the same adverse event, repay their debts in some countries but not in others? Could it be related to the way that credit markets are regulated in these different countries: households may be more likely to default if they can be less effectively punished. To assess this we investigate how some of the regulatory and institutional differences across countries are related to the incidence of arrears. We run further regressions that include both the shock and the shock with some institutional variables. Formally, we redefine our latent variable D_{it}^* as follows:

$$D_{it}^{**} = X_{it}'\beta + \delta I_c A_{it} + f_i + u_{it} \quad (1)$$

where X_{it}' denotes the demographic variables (and includes year fixed effects), I_c denotes the country specific institutions, and A_{it} the adverse events. The results are reported in table 7 for each of our institutions and each of the three shocks.

One set of factors likely to be relevant are those pertaining to the legal enforcement of contracts. Hence, we investigate the effect on arrears of two contract enforcement indicators that measure the efficiency of the judicial system in the collection of overdue debt, namely the total number of calendar days for dispute resolution, ‘time’ and and the cost of judicial proceedings ‘cost’ as described in the data section, as well as the number of procedures ‘proc’ necessary to enforce the repayment of debts. On information sharing, we investigate

the role of credit bureau coverage.

The effect of the household characteristics is largely unchanged and have already been discussed. Columns (1)-(4) assess the effect of institutions and the percentage fall in income. In each case the effect of the shock, as before, is positive; households whose income falls are more likely to have been in arrears over the last year. However, neither cost, time nor coverage significant affect the incidence of arrears. However, the number of procedures significantly reduces the incidence of arrears when the household's income falls.

In columns (5)-(8) the shock is whether there has been a fall in income. This time all the institutions affect whether the household enters arrears when they experience the shock: cost, the number of procedures, and coverage reduce the incidence of arrears while arrears increase with cost. The last four columns investigate the role of institutions when the household reports that their income situation is worse, and the coefficients are again highly significant, although the estimated coefficient is always around 50 percent larger.

The negative effect that we estimate for time and for number of procedures is surprising. If both measure the difficulty in recovering debts through the legal system, we might expect that increasing the difficulty would increase the incidence of arrears, but we find the opposite effect. However, increasing the cost has a positive effect, suggesting that arrears increase as it becomes more costly to recover debts.

Coverage has a positive sign, which is consistent with the view that if any arrears become widely publicized then households become less willing to miss their payments. That is, households care about their reputation and are less likely to default if other lenders can learn of their failure to repay their debts.⁴ An alternative explanation is that households that have defaulted in the past can be effectively excluded from credit markets and thus will not be in arrears. Note, however, we include household specific effects in the fixed effect probit regression.

Tables 8 and 9 repeats the same analysis for arrears on mortgage debts and on other debts respectively. When mortgage debts are investigated, none of the institutions affects the incidence of arrears when assessing the effect of the percentage fall in income, and

⁴We experimented with the coverage of public credit registries, but found that this institution did not have any effect on how households reacted to the shock, and hence we do not report these results.

only cost has an effect when looking at whether income has fallen. The estimated effect is positive, which is in line with theory. However, all the institutions affect arrears when the household believes its income situation has deteriorated over the last year. Time continues to have a positive effect but all the other institutions have effects consistent with intuition. Indeed increasing the number of procedures from the lowest level to the highest level among the countries in our sample doubles the response to the shock in column (11). Cost and coverage also causes the response to the self-reported deteriorating income situation to a similar extent. However, the implied response to time is smaller (as well as being of the ‘wrong’ sign).

The response to arrears on other debts is similar, coverage significantly reduces the response to an income fall, while cost increases and time reduces the response to a worsening income situation. The coefficients, however, tend to be slightly smaller than those for the mortgage arrears.

4 Conclusion

The focus of this study has been to understand the determinants of household “default” or more precisely to understand when they miss their scheduled loan repayments and enter arrears. Our results have first showed that although certain types of household (such as renters) are more likely to be in arrears, falling behind on repayments is often precipitated by an adverse shock to the household’s income. Those households whose real income declined, or where the household head lost their job, are significantly more likely not to repay their debts on schedule. However, households in different countries respond differently to adverse shocks.

To explain these cross-country differences, our paper then turned to the role of institutional factors that capture differences in how effectively default can be punished. We know from the literature on law and finance, such as the papers by La Porta (1998), Guiso et al. (2004), and Jappelli et al. (2005), that institutional factors are important in explaining credit availability. This paper has shown that these factors are also important in explaining arrears.

To summarize, this paper has shown that adverse shocks matter, but the extent to which the shock results in arrears depends crucially on the the cost of default. We have concentrated on four institutional factors: the length of the judicial process, the cost of this process, the number of specific procedures, and the coverage of private credit bureaus. We have found that reducing the cost and increasing the coverage both reduced the effect of adverse events on arrears in most specifications. However, the number of procedures had an ambiguous effect, since it increased arrears overall, but reduced mortgage arrears. Reducing the length of time of the judicial process, in contrast, seemed to increase the effect of the shock on arrears.

Consequently, this paper emphasizes that the decision to default is partly strategic: households in similar circumstances fail to repay their loans on time in some institutional environments, but ensure to keep up with their repayments in others. This highlights the crucial role of institutions in mediating any adverse shock that the household suffers. While the optimal design of institutions is beyond the scope of this paper, we would like to conclude by noting that our results do not suggest that institutions should be designed to ensure repayment. After all, in the absence of alternative ways of insuring themselves against shocks, it may indeed be socially optimal to allow households who experience an adverse shock to fall into arrears and default on their debts.

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Table 1: Summary Statistics for the ECHP

	All		If borrowing	
	mean	std. dev.	mean	std. dev.
Age	44.35	8.08	43.34	7.99
Tertiary Education	0.23	0.42	0.28	0.45
Secondary Education	0.33	0.47	0.34	0.47
Less than Secondary Education	0.43	0.50	0.38	0.49
Mortgage	0.55	0.50	0.86	0.35
Own House	0.71	0.45	0.98	0.15
Household Size	3.24	1.36	3.35	1.32
No. children	0.92	1.07	1.03	1.11
Couple	0.81	0.39	0.87	0.34
Single woman	0.10	0.30	0.07	0.26
Self-employed	0.16	0.37	0.14	0.35
Employed	0.85	0.36	0.90	0.30
Change in log-income	0.03	0.49	0.03	0.42
Negative income shock	0.45	0.50	0.44	0.50
Income situation better	0.17	0.38	0.23	0.42
Income situation same	0.47	0.50	0.48	0.50
Income situation worse	0.20	0.40	0.18	0.39
Unemployment shock	0.03	0.18	0.03	0.16
Negative health shock	0.03	0.17	0.02	0.15
Real interest rate	5.36	2.78	4.78	2.00
Sample size	141,457		96,154	
Avg. per country	10,104		6,868	
Avg. per year	23,576		13,872	

Authors calculation based on the ECHP.

Table 2: Some basic statistics on debt in the EU

Country	Debt			Arrears		
	Any Debt	Mortgage	Other	Any	Mortgage	Other
Denmark	96.29	93.60	59.36	2.23	0.88	1.11
Netherlands	95.79	95.11	31.06	0.73	0.36	0.26
Belgium	75.89	70.31	28.51	7.28	4.08	3.02
France	78.90	65.33	44.84	6.72	2.43	2.00
Ireland	76.71	67.69	40.89	7.92	4.80	2.61
Italy	31.00	22.75	14.37	7.46	3.78	2.62
Greece	29.12	18.87	15.41	30.89	20.78	8.13
Spain	47.56	33.73	24.24	5.60	3.47	2.11
Portugal	38.66	30.01	16.47	2.78	0.88	1.61
Austria	57.62	51.98	18.10	1.51	0.61	0.96
Finland	70.62	58.87	41.20	24.02	9.24	6.32
Luxembourg	77.23	64.73	43.26	3.04	1.17	0.55
Total	63.50	54.89	30.85	6.15	2.93	2.03

Authors calculations based on the 1995-2001 waves of the ECHP. Any debt refers to the proportion of households holding any kind of debt. Mortgage refers to the proportion holding a mortgage. ‘Arrears’ refers to whether the household has missed a scheduled rent, mortgage, utility or hire-purchase payment in the last 12 months, in each case conditional on whether debts are held by the household.

Table 3: Percentage of Households in Arrears by Event

	Any Loan	Mortgage	Other Loan
Overall	7.87	1.55	2.25
Renter	9.36	-	2.67
Home-owner	5.75	2.99	1.64
Unemployment Shock			
No	7.31	1.45	2.06
Yes	15.22	2.79	3.95
Negative Income Shock			
No	7.55	1.47	2.16
Yes	9.04	1.82	2.55
Negative Health Shock			
No	7.71	1.51	2.14
Yes	15.80	2.71	4.65
Income Situation Worse			
No	5.72	1.16	1.64
Yes	15.25	2.88	4.35

Authors calculations based on the 1995-2001 waves of the ECHP.

Table 4: The Incidence of Household Arrears (standard errors in parenthesis).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
age	0.211 (0.197)	0.299 (0.197)	0.311 (0.197)	0.307 (0.197)	0.315 (0.195)	0.182 (0.193)	0.218 (0.190)
age-squared	-0.022 (0.022)	-0.032 (0.022)	-0.034 (0.022)	-0.033 (0.022)	-0.034 (0.022)	-0.020 (0.022)	-0.023 (0.021)
house	-0.591*** (0.030)	-0.586*** (0.030)	-0.588*** (0.030)	-0.586*** (0.030)	-0.586*** (0.029)	-0.575*** (0.029)	-0.576*** (0.028)
no. child	0.190*** (0.014)	0.190*** (0.014)	0.189*** (0.014)	0.190*** (0.014)	0.188*** (0.014)	0.185*** (0.014)	0.182*** (0.013)
couple	-0.299*** (0.037)	-0.267*** (0.037)	-0.257*** (0.037)	-0.265*** (0.037)	-0.256*** (0.037)	-0.287*** (0.037)	-0.263*** (0.035)
self-employed	0.023 (0.034)	-0.017 (0.034)	-0.017 (0.034)	-0.000 (0.034)	-0.001 (0.034)	0.028 (0.033)	0.030 (0.032)
interest rate	0.125*** (0.005)	0.124*** (0.005)	0.123*** (0.005)	0.124*** (0.005)	0.120*** (0.005)	0.121*** (0.005)	0.111*** (0.005)
ln-income	-3.169*** (0.188)	-3.736*** (0.197)	-3.781*** (0.197)	-3.842*** (0.197)	-3.832*** (0.195)	-3.090*** (0.186)	-3.245*** (0.186)
shock		0.254*** (0.024)		0.253*** (0.022)		0.365*** (0.022)	
shock ×							
Denmark			0.399** (0.175)		0.189** (0.084)		0.119 (0.103)
Neth.			0.011 (0.120)		-0.023 (0.073)		0.048 (0.074)
Belgium			0.534*** (0.084)		0.438*** (0.064)		0.751*** (0.070)
France			0.442*** (0.059)		0.496*** (0.045)		0.660*** (0.043)
Ireland			0.633*** (0.152)		0.322*** (0.075)		0.373*** (0.081)
Italy			0.227*** (0.051)		0.198*** (0.045)		0.199*** (0.045)
Greece			0.461*** (0.079)		0.474*** (0.057)		0.816*** (0.056)
Spain			0.167*** (0.041)		0.158*** (0.053)		0.197*** (0.058)
Portugal			-0.027 (0.093)		-0.248*** (0.084)		-0.251*** (0.076)
Austria			0.052 (0.166)		-0.217* (0.111)		-0.172 (0.108)
Country Diff.			54.44		112.06		601.69
p-value			(0.000)		(0.000)		(0.000)

Table 5: Mortgage Arrears (standard errors in parenthesis).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
age	0.980*** (0.360)	1.039*** (0.361)	1.036*** (0.360)	1.054*** (0.361)	1.023*** (0.355)	0.968*** (0.356)	0.900*** (0.346)
age-squared	-0.120*** (0.040)	-0.127*** (0.041)	-0.126*** (0.040)	-0.129*** (0.041)	-0.125*** (0.040)	-0.120*** (0.040)	-0.111*** (0.038)
no. child	0.120*** (0.024)	0.119*** (0.024)	0.118*** (0.024)	0.120*** (0.024)	0.115*** (0.023)	0.115*** (0.023)	0.109*** (0.022)
couple	-0.116* (0.070)	-0.094 (0.071)	-0.086 (0.070)	-0.109 (0.071)	-0.083 (0.070)	-0.109 (0.071)	-0.090 (0.066)
self-employed	0.178*** (0.056)	0.137** (0.057)	0.133** (0.057)	0.152*** (0.057)	0.148*** (0.056)	0.183*** (0.056)	0.182*** (0.055)
interest rate	0.041*** (0.009)	0.039*** (0.009)	0.039*** (0.009)	0.039*** (0.009)	0.039*** (0.009)	0.036*** (0.009)	0.040*** (0.009)
ln income	-2.011*** (0.317)	-2.406*** (0.328)	-2.474*** (0.328)	-2.510*** (0.329)	-2.531*** (0.324)	-1.909*** (0.316)	-2.014*** (0.315)
shock		0.206*** (0.038)		0.233*** (0.039)		0.288*** (0.040)	
Country Diff.			32.34		46.27		98.80
p-value			(0.000)		(0.000)		(0.000)

Estimated using Random Effects Probit regression using the 1995-2000 waves of the ECHP. All regressions include a full set of year dummies. The shock is the percentage fall in income in cols (2) and (3), whether income has fallen in cols (4) and (5), and whether reported income situation is worse in cols (6) and (7)

Table 6: Arrears on Other Debts (standard errors in parenthesis).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
age	0.324 (0.254)	0.372 (0.255)	0.386 (0.255)	0.383 (0.254)	0.387 (0.252)	0.303 (0.251)	0.324 (0.248)
age-squared	-0.040 (0.029)	-0.046 (0.029)	-0.048* (0.029)	-0.047* (0.029)	-0.048* (0.028)	-0.039 (0.028)	-0.041 (0.028)
house	-0.521*** (0.037)	-0.516*** (0.037)	-0.518*** (0.037)	-0.514*** (0.037)	-0.514*** (0.037)	-0.507*** (0.037)	-0.512*** (0.036)
no. child	0.163*** (0.017)	0.162*** (0.017)	0.163*** (0.017)	0.163*** (0.017)	0.162*** (0.017)	0.160*** (0.017)	0.153*** (0.017)
couple	-0.180*** (0.047)	-0.164*** (0.047)	-0.155*** (0.047)	-0.162*** (0.047)	-0.151*** (0.047)	-0.176*** (0.046)	-0.155*** (0.046)
self-employed	0.048 (0.044)	0.023 (0.045)	0.022 (0.045)	0.032 (0.044)	0.035 (0.044)	0.051 (0.044)	0.056 (0.043)
interest rate	0.037*** (0.007)	0.037*** (0.007)	0.040*** (0.007)	0.037*** (0.007)	0.040*** (0.007)	0.033*** (0.007)	0.039*** (0.007)
ln income	-1.732*** (0.255)	-1.966*** (0.264)	-2.020*** (0.263)	-2.077*** (0.265)	-2.093*** (0.262)	-1.638*** (0.254)	-1.709*** (0.255)
shock		0.155*** (0.034)		0.163*** (0.030)		0.267*** (0.030)	
Country Diff.			33.26		55.83		62.18
p-value			(0.000)		(0.000)		(0.000)

Estimated using Random Effects Probit regression using the 1995-2000 waves of the ECHP. All regressions include a full set of year dummies. The shock is the percentage fall in income in cols (2) and (3), whether income has fallen in cols (4) and (5), and whether reported income situation is worse in cols (6) and (7).

Table 7: Institutions and Household Arrears (standard errors in parenthesis).

	Percentage Fall in Income			Fall in Income			Income Situation Worse					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
age	0.297 (0.197)	0.298 (0.197)	0.303 (0.197)	0.297 (0.197)	0.303 (0.197)	0.308 (0.197)	0.310 (0.197)	0.305 (0.197)	0.184 (0.193)	0.172 (0.193)	0.192 (0.193)	0.169 (0.193)
age-squared	-0.032 (0.022)	-0.032 (0.022)	-0.033 (0.022)	-0.032 (0.022)	-0.033 (0.022)	-0.033 (0.022)	-0.034 (0.022)	-0.033 (0.022)	-0.020 (0.022)	-0.019 (0.022)	-0.022 (0.022)	-0.019 (0.022)
house	-0.586*** (0.030)	-0.586*** (0.030)	-0.586*** (0.030)	-0.586*** (0.030)	-0.586*** (0.030)	-0.590*** (0.030)	-0.586*** (0.030)	-0.585*** (0.030)	-0.576*** (0.029)	-0.584*** (0.029)	-0.576*** (0.029)	-0.575*** (0.029)
no. children	0.189*** (0.014)	0.190*** (0.014)	0.189*** (0.014)	0.190*** (0.014)	0.190*** (0.014)	0.190*** (0.014)	0.190*** (0.014)	0.191*** (0.014)	0.183*** (0.014)	0.184*** (0.014)	0.185*** (0.014)	0.186*** (0.014)
couple	-0.267*** (0.037)	-0.267*** (0.037)	-0.266*** (0.037)	-0.267*** (0.037)	-0.262*** (0.037)	-0.267*** (0.037)	-0.265*** (0.037)	-0.264*** (0.037)	-0.274*** (0.036)	-0.287*** (0.036)	-0.287*** (0.036)	-0.282*** (0.036)
self-employed	-0.017 (0.034)	-0.017 (0.034)	-0.019 (0.034)	-0.017 (0.034)	0.001 (0.034)	-0.002 (0.034)	-0.001 (0.034)	0.001 (0.034)	0.027 (0.033)	0.025 (0.033)	0.027 (0.034)	0.028 (0.033)
interest rate	0.124*** (0.005)	0.124*** (0.005)	0.123*** (0.005)	0.124*** (0.005)	0.125*** (0.005)	0.122*** (0.005)	0.122*** (0.005)	0.124*** (0.005)	0.123*** (0.005)	0.116*** (0.005)	0.117*** (0.005)	0.121*** (0.005)
ln income	-3.725*** (0.197)	-3.733*** (0.198)	-3.760*** (0.198)	-3.722*** (0.198)	-3.822*** (0.197)	-3.837*** (0.197)	-3.848*** (0.197)	-3.820*** (0.197)	-3.141*** (0.186)	-3.086*** (0.186)	-3.088*** (0.186)	-3.114*** (0.186)
shock	0.276*** (0.030)	0.245*** (0.051)	0.573*** (0.145)	0.272*** (0.030)	0.288*** (0.026)	0.130*** (0.041)	0.508*** (0.105)	0.315*** (0.028)	0.452*** (0.026)	0.154*** (0.042)	0.762*** (0.110)	0.482*** (0.028)
shock×Time	-0.005 (0.005)				-0.009** (0.004)				-0.022*** (0.004)			
shock×Cost		0.001 (0.007)				0.022*** (0.006)				0.038*** (0.006)		
shock×Proc.			-0.015** (0.007)				-0.013** (0.005)				-0.020*** (0.005)	
shock×Cov.				-0.082 (0.085)				-0.221*** (0.062)				-0.416*** (0.063)

Estimated using Random Effects Probit regression using the 1995-2000 waves of the ECHP. All regressions include a full set of year dummies. Time is the number of days (in 100s); Proc. is the number of procedures; while Cov. is the coverage of private credit bureaus.

Table 8: Institutions and Mortgage Arrears (standard errors in parenthesis).

	Percentage Fall in Income						Income Situation Worse					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
age	1.041*** (0.362)	1.033*** (0.361)	1.038*** (0.361)	1.041*** (0.361)	1.051*** (0.361)	1.034*** (0.359)	1.047*** (0.361)	1.047*** (0.361)	0.965*** (0.355)	0.936*** (0.351)	0.955*** (0.356)	0.948*** (0.355)
age-squared	-0.127*** (0.041)	-0.126*** (0.041)	-0.127*** (0.041)	-0.127*** (0.041)	-0.128*** (0.041)	-0.126*** (0.040)	-0.128*** (0.041)	-0.128*** (0.041)	-0.119*** (0.040)	-0.116*** (0.039)	-0.118*** (0.040)	-0.117*** (0.040)
no. child	0.120*** (0.024)	0.118*** (0.024)	0.119*** (0.024)	0.119*** (0.024)	0.120*** (0.024)	0.118*** (0.023)	0.120*** (0.024)	0.121*** (0.024)	0.113*** (0.023)	0.109*** (0.023)	0.115*** (0.023)	0.116*** (0.023)
couple	-0.091 (0.071)	-0.095 (0.070)	-0.093 (0.071)	-0.093 (0.071)	-0.101 (0.070)	-0.105 (0.070)	-0.110 (0.070)	-0.108 (0.070)	-0.095 (0.069)	-0.095 (0.068)	-0.094 (0.069)	-0.093 (0.069)
self-employed	0.136** (0.057)	0.138** (0.057)	0.137** (0.057)	0.135** (0.057)	0.152*** (0.057)	0.147*** (0.056)	0.152*** (0.057)	0.152*** (0.057)	0.181*** (0.056)	0.178*** (0.055)	0.185*** (0.056)	0.181*** (0.056)
interest rate	0.038*** (0.009)	0.039*** (0.009)	0.039*** (0.009)	0.039*** (0.009)	0.039*** (0.009)	0.035*** (0.009)	0.041*** (0.009)	0.039*** (0.009)	0.038*** (0.009)	0.028*** (0.009)	0.043*** (0.009)	0.037*** (0.009)
ln income	-2.418*** (0.329)	-2.385*** (0.328)	-2.404*** (0.328)	-2.425*** (0.329)	-2.504*** (0.329)	-2.513*** (0.327)	-2.504*** (0.329)	-2.500*** (0.329)	-1.942*** (0.316)	-1.906*** (0.313)	-1.915*** (0.315)	-1.931*** (0.316)
shock	0.177*** (0.047)	0.097 (0.077)	0.183 (0.188)	0.178*** (0.049)	0.244*** (0.048)	-0.052 (0.079)	0.035 (0.205)	0.270*** (0.050)	0.345*** (0.015)**	-0.108 (0.007)	-0.359* (0.011)	0.398*** (0.011)
shock×Time	0.007 (0.007)				-0.003 (0.007)							
shock×Cost		0.014 (0.010)				0.046*** (0.011)				0.067*** (0.011)		
shock×Proc			0.001 (0.012)				0.010 (0.009)				0.031*** (0.010)	
shock×Cov.				0.126 (0.130)				-0.129 (0.104)				-0.400*** (0.115)

Estimated using Random Effects Probit regression using the 1995-2000 waves of the ECHP. All regressions include a full set of year dummies. Time is the number of days (in 100s); Proc. is the number of procedures; while Cov. is the coverage of private credit bureaus.

Table 9: Institutions and Arrears on Other Debts (standard errors in parenthesis).

	Percentage Change in Income						Income Situation Worse					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
age	0.373 (0.255)	0.373 (0.255)	0.372 (0.255)	0.371 (0.255)	0.383 (0.254)	0.384 (0.254)	0.383 (0.254)	0.380 (0.254)	0.303 (0.251)	0.287 (0.250)	0.302 (0.251)	0.296 (0.251)
age-squared	-0.046 (0.029)	-0.046 (0.029)	-0.046 (0.029)	-0.046 (0.029)	-0.047* (0.029)	-0.048* (0.029)	-0.047* (0.029)	-0.047 (0.029)	-0.039 (0.028)	-0.037 (0.028)	-0.039 (0.028)	-0.038 (0.028)
house	-0.516*** (0.037)	-0.515*** (0.037)	-0.516*** (0.037)	-0.516*** (0.037)	-0.514*** (0.037)	-0.517*** (0.037)	-0.514*** (0.037)	-0.513*** (0.037)	-0.507*** (0.037)	-0.513*** (0.036)	-0.507*** (0.037)	-0.506*** (0.037)
no. child	0.163*** (0.017)	0.163*** (0.017)	0.162*** (0.017)	0.162*** (0.017)	0.163*** (0.017)	0.163*** (0.017)	0.163*** (0.017)	0.164*** (0.017)	0.159*** (0.017)	0.159*** (0.017)	0.160*** (0.017)	0.161*** (0.017)
couple	-0.165*** (0.047)	-0.163*** (0.047)	-0.164*** (0.047)	-0.164*** (0.047)	-0.162*** (0.047)	-0.162*** (0.047)	-0.162*** (0.047)	-0.161*** (0.047)	-0.169*** (0.046)	-0.175*** (0.046)	-0.176*** (0.046)	-0.175*** (0.046)
self-employed	0.022 (0.045)	0.022 (0.045)	0.023 (0.045)	0.023 (0.045)	0.032 (0.044)	0.031 (0.044)	0.032 (0.044)	0.033 (0.044)	0.051 (0.044)	0.048 (0.044)	0.051 (0.044)	0.051 (0.044)
interest rate	0.037*** (0.007)	0.037*** (0.007)	0.037*** (0.007)	0.037*** (0.007)	0.037*** (0.007)	0.036*** (0.007)	0.037*** (0.007)	0.037*** (0.007)	0.035*** (0.007)	0.029*** (0.007)	0.034*** (0.007)	0.033*** (0.007)
ln income	-1.972*** (0.264)	-1.976*** (0.264)	-1.970*** (0.264)	-1.964*** (0.264)	-2.076*** (0.265)	-2.077*** (0.264)	-2.077*** (0.265)	-2.060*** (0.265)	-1.675*** (0.254)	-1.633*** (0.253)	-1.638*** (0.254)	-1.648*** (0.254)
shock	0.132*** (0.044)	0.196*** (0.070)	0.212 (0.212)	0.159*** (0.044)	0.166*** (0.037)	0.097* (0.056)	0.155 (0.153)	0.220*** (0.039)	0.311*** (0.036)	0.092* (0.056)	0.240 (0.157)	0.305*** (0.039)
shock×Time	0.005 (0.006)				-0.001 (0.006)					-0.012** (0.005)		
shock×Cost		-0.006 (0.009)				0.012 (0.008)				0.033*** (0.009)		
shock×Proc.			-0.003 (0.010)			0.000 (0.007)					0.001 (0.008)	
shock×Cov.				-0.018 (0.118)				-0.204** (0.086)				-0.130 (0.084)

Estimated using Random Effects Probit regression using the 1995-2000 waves of the ECHP. All regressions include a full set of year dummies. Time is the number of days (in 100s); Proc. is the number of procedures; while Cov. is the coverage of private credit bureaus.