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HOUSEHOLD DEBT REPAYMENT BEHAVIOUR:
WHAT ROLE DO INSTITUTIONS PLAY?



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Household Debt Repayment Behaviour: what role do institutions play?

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Abstract

Household debt repayment behavior has been understudied, especially empirically, despite the heightened debate on rising household debt, personal bankruptcy filings, and arrears. In this paper, we use 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 start our analysis by showing that falling into arrears has important long-term consequences for employment, self-employment, home-ownership, and health. Next, we show how arrears themselves are the result of adverse events that affect a household, such as bad health or unemployment. Finally, we show that there are important cross-country differences in how households react to these adverse events. These differences can be partly explained by local financial and judicial institutions. Indicators covering contract enforcement and the degree of credit information sharing are used to capture the costs associated with default. In particular, we show that while adverse shocks are highly important, the extent to which they affect household debt repayment depends crucially on the penalty for defaulting.

Keywords: Households Borrowing, Arrears, Institutions

JEL classification: D12, D14, G2.

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1. INTRODUCTION

Despite the lively policy debate on rising household debt, arrears and personal bankruptcy filings, there is relatively little empirical evidence on the determinants of households' debt repayment behaviour and the incidence of arrears. Even less is known about how rates of arrears compare between countries, although debt levels vary widely. The recent turmoil in the household credit market (especially among the US sub-prime borrowers) underscores the need to better understand when and why households fail to repay their debts, which households get into repayment difficulties, and how policies and institutions affect debt repayment, arrears, and default. Answers to these conundrums have wider importance since they also shed light on households' ability to smooth consumption against idiosyncratic shocks. This paper aims to present some evidence from Europe on which types of households enter arrears, how these arrears differ across countries, how some of these differences are related to institutions, and how arrears affect these households in the years that follow.

Many commentators view default as the consequence of a genuine inability to repay. That is, a household's decision to default is determined by adverse events, such as earnings or employment shocks, or health problems. However, in the macroeconomics literature, the decision to default is often modelled to depend on the cost of default, including legal costs and consequences of autarky. For example, in papers by Kocherlakota (1996), Kehoe and Levine (2001), Athreya (2002), and Chatterjee et al. (2007), households compare the punishment for (cost of) default with the benefit from renegeing 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 hitherto to the lack of suitable data. In an important paper, Fay et al. (2002) use the PSID to analyze the bankruptcy decisions of US households. However, not only is bankruptcy rather rare in the PSID, it also seems to be significantly under-reported. In contrast, Gross and Souleles (2002) analyze household delinquency and bankruptcy using administrative data from US credit card accounts. However, while it is more common to observe default in administrative credit card data, these data provide very little information about some potentially important variables (such as changes in employment status) and are not representative of the overall population. Gross and Souleles (2002) conclude that bankruptcy has become more common over their sample period, and attribute this to declining social stigma felt by bankrupts. Several UK studies have exploited the British Household Panel Survey to investigate financial difficulties, debt burdens, and the evolution of debt problems. Both Boheim and Taylor (2000) and May and Tudela (2005) study housing evictions, while May, Tudela, and Young (2004) look 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; households that often particularly concern policymakers.

Our paper complements these studies by investigating arrears among European households. It also investigates how institutions affect these arrears. We use data from the European Community Household Panel (ECHP), a random sample of EU households for 1994–2001 for each of the then members of the European Community. The paper has three

main objectives. First, we will show that falling into arrears has important long-term consequences for employment, self-employment, home-ownership, and health. Second, we will show how arrears are themselves the result of adverse events that affect a household, such as bad health, unemployment, or a reduction in income. Third, we will show that there are nevertheless important cross-country differences in how households react to these adverse events, and that these differences can partly be explained by local financial and judicial institutions (which are summarised in Box 1). These institutions are used as a proxy to capture the differences in the punishment for and the cost of default. Hence the primary aim of our paper is to understand the role of institutions in household arrears.

Several earlier studies have emphasized the role of institutions for 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. Of course, if lenders react to the change in institutions by restricting credit, this would weaken the relationship between observed arrears and institutions. Overall, we might expect some combination of reduced credit and increased arrears. Accordingly, this study complements the previous studies that emphasize the response of lenders by investigating, in contrast, the response of borrowers.

Using the ECHP offers several unique advantages. First, rather than analyzing bankruptcy—a low probability event that is really a legal status—we use data on arrears to analyze household debt repayment behaviour. After all, relatively few households that default on their debts become bankrupt. Second, the panel nature of the data allows us to investigate how the incidence of arrears evolves as a household experiences income and other types of shocks, while also controlling for unobserved heterogeneity. Moreover, the data allows us to monitor what happens to those households that enter arrears. Third, since we have nationally representative data for each EU country, we can compare the behaviour of households in different countries and assess the role of differences in national institutions. Finally, the data provide separate information on mortgage arrears (which are collateralized) and arrears on unsecured loans. This detail provides a further opportunity to see how different institutional environments might explain why some households choose to repay their loans but other seemingly similar households do not.

After providing a detailed description of our data in section 2, we start our discussion in Section 3 by first analyzing what happens to households who fall into arrears. This exercise shows that arrears could be indicators of longer-term stress and have severe consequences. In particular, even four years later and after controlling for their initial status, our results show that households who fall into arrears are more likely to become unemployed, less likely to be self-employed, more likely to report bad health, and less likely to be home owners. In Section 4, we investigate the determinants of household debt repayment behaviour, and analyze how the propensity to fall into arrears is affected by adverse events. We then show how the responses to adverse events vary across countries and how these responses depend on local financial and judicial institutions. These institutional differences affect the cost of, and punishment for, default. Our results show that adverse shocks are important, but the extent to which they matter depends crucially on

the punishment associated with default. Section 5 concludes with a discussion of these results and some remarks on their policy implications.

2. DATA

2.1. The European Community Household Panel

This paper uses data from the European Community Household Panel (ECHP). The dataset is a nationally representative panel of households, collected between 1994 and 2001, in each of the 14 countries in the European Union at that time. 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 questions on whether the household has any housing debts, and on whether the household is making non-housing loan repayments (such as on a loan or hire purchase agreement). Our key variable of interest is whether the household reports it has been unable to make a scheduled loan or utility payment during the last 12 months. There are separate questions to capture arrears on rent, utility bills, mortgage, or other scheduled payments on non-housing debt.

There are a number of advantages in using this survey, as discussed in the introduction. First, the data are nationally representative, unlike administrative credit card data. Second, since households are asked the same questions in all EU countries, we can compare the behaviour of similar households in different EU countries. Third, the survey focuses specifically on arrears over the last 12 months. Few other surveys concentrate on arrears, rather than bankruptcy. For example, Fay et al. (2002) exploited the 1996 wave of the PSID which asked whether the household had filed for bankruptcy. They found that only 250 households reported having filed, which was only around 1 percent of their sample, and less than half the national filing rate, suggesting bankruptcy is significantly under-reported. 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. Fourth, the panel component of our data allows us to investigate the evolution of income and arrears for the same household over time. In particular, we can investigate how the incidence of arrears evolves as the household experiences income and other types of shock, while also controlling for unobserved heterogeneity. Lastly, we can study both housing and non-housing debts separately.

However, some disadvantages remain: arrears are self-reported, and hence likely to be under-reported as was bankruptcy in the PSID. More importantly, we do not know the extent of arrears, nor do we know the level of debt. Not knowing the extent of the arrears means that reporting being 'unable to meet a scheduled debt repayment' covers a wide range of different behaviour by the borrower, from bankruptcy, to being a few weeks behind on their payments. Nevertheless, lenders typically view late payments as a signal that the loan is potentially at risk. Despite these potential shortcomings, we believe that these data are quite informative about arrears and household debt repayment behaviour.

A key relationship we study is the role adverse events play in subsequent arrears. The adverse events we investigate are: the percentage decline in household income over the last 12 months; a dummy variable indicating whether the household's real income has declined by over 7.5 percent over the last 12 months; and a dummy for whether the household reports their income situation to be worse compared to previous year. Throughout, household income is measured in real 1996 euros, and the regressions include the 3-month money market interest rate for each country.

In constructing our sample, we follow the literature and 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. Because our focus is on income risk alone, we include only stable households even though divorce may well be an important factor in explaining household default. Due to what looks like measurement problems, we exclude data from Finland and the 1996 wave in the data for Greece. Unfortunately, we must also drop Sweden, Germany, and the UK because our key variables of interest were not asked for households in these countries.

After these restrictions, we have over 100,000 observations, about 16,500 in each year and on average about 8,500 for each of the included countries. Table 1 summarizes the main variables of interest for our full sample. The table shows that around 80 percent of households comprised married or co-habiting couples, and the average number of children in each household was slightly less than one. The average age of the household head was 44, while about a fifth of households have completed a university degree, and a further third have finished secondary education. The table shows 73 percent of the households were home-owners and 17 percent were self-employed. On average each household's income had increased by 3 percent over the last year but around a quarter of households had seen their real incomes decline. Table 1 also presents summary statistics for the sub-sample of households with currently outstanding debts. This sample is smaller, with about 55,000 households. The households in this sub-sample are on average better educated, are more likely to be a couple, are more likely to have children, and to own their homes, and are less likely to be self-employed.

Of key interest for this paper are the wide differences across countries in debt levels and in arrears. Therefore, table 2 presents the proportion of households with debts and the proportion in arrears by country. These numbers show that the percentage of households with some debt (housing and/or non-housing) is highest in Denmark and the Netherlands, and is lowest in Italy and Greece. This difference between the Northern and the Mediterranean countries is fairly well known and is similar to those reported in Crook (2006). The last three columns are the focus of this paper; they report the percentage of households who have missed any scheduled loan or utility payment, a mortgage payment, or non-housing debt repayment. While the cross-country pattern no longer follows the exact Northern-Southern divide, differences remain significant. Moreover, arrears are not always the highest where the incidence of debt is highest: while the proportion of indebted households is fairly high among Dutch households, they seem to be the least likely to be in arrears. Reported arrears on any loan are highest in Greece, followed by Ireland and Italy, but Greek households are among the least likely to have debts. The table shows that the level of debt and the level of arrears both differ substantially between EU countries. But importantly, it also shows that higher arrears are not the necessary corollary of high debt

levels, and that some other mechanism must be involved in causing households to fall behind on paying their debts.

2.2. Institutions

To understand the differences in arrears across countries, we follow the law and finance literature and use data on institutions to proxy for differences in the cost of ‘default’. Such institutions can affect arrears and default in two ways. First, they can have a direct effect as making debts more difficult to recover is likely to make default more attractive to borrowers. Second, they may have an indirect effect, where lenders are likely to restrict credit and react by changing the loan terms that they offer. Because our data does not contain information on either the debt level or on the loan terms, this paper will analyze the overall effect of institutions for the rate of arrears. Nonetheless, we note that if lenders restrict credit when institutions are worse, the estimated effect of institutions on arrears will be under-estimated.

We consider three contract enforcement indicators, explained more fully in box 1, which measure the efficiency of the judicial (or administrative) system in the collection of overdue debt: 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 (as a percentage of the debt) of judicial proceedings. We would expect that borrowers are more willing to default as court action becomes more costly. We also add two additional variables which measure the coverage of private credit bureaus and of public credit registries, both expressed as a percentage of the adult population. They report the number of individuals and unincorporated firms listed in the respective registry with current information on repayment history, unpaid debts, or credit outstanding. While these variables do not directly affect the ability of lenders to enforce repayment through the courts, they capture whether other potential lenders will learn about the debtors’ behaviour, and thus affect households’ ability to borrow in the future. The data, together with a detailed description of these variables and how they are constructed, can be found on the Doing Business Indicators website (www.doingbusiness.org) and in Djankov et al. (2003) and Djankov et al. (2006).¹

Table 3 presents a summary of these institutional indicators, and highlights how the differences between the EU countries can be large. For example, the average length of trials is only 48 days in the Netherlands but is nearly four years in Italy. The cost is also correspondingly small in the Netherlands but is substantial in Spain and Belgium. All households are covered by private credit bureaus in Ireland but these institutions do not operate in France or Belgium. However, in France and Belgium, households are recorded on public credit registers (even if relatively few households are included in the public registry in France).

These differences are likely to impact household behaviour, and the goal of this paper is precisely to understand these effects. Box 1 outlines that we expect all the variables to increase the incidence of arrears through the direct effect on the incentives to default

¹ The data set used in our analysis was downloaded from the Doing Business indicators website in May 2006. We have noticed that due to a change in methodology in 2007, our institutional numbers no longer match those that are now listed on this website. Fortunately, however, the ordering across the countries remains constant with these new measures despite the change in levels, which implies that our results should not be affected by this change.

among existing debtors. However, the variables also have indirect effects. If borrowers can less effectively be punished for default this might also encourage them to additional borrowing that they might not otherwise have undertaken. Lenders, on the other hand, are likely to reduce their lending if they anticipate that recovering the debt might be difficult or expensive.

For the two coverage variables there are additional subtleties. Since these variables affect whether other creditors learn about delinquent behaviour, they can be expected to have a negative affect on arrears. If other lenders will learn of any failure to repay the debts, then these households have greater incentive to repay their debts since it will become more difficult for them to apply for a loan from alternative lenders. A side effect is that creditors will know about the credit history of households to which they have not previously made a loan, which may well increase the overall level of credit in the economy. If households enter arrears due to some unexpected adverse shock then extending credit to more borrowers might instead cause more households to be in arrears. Increasing information about the repayment behaviour of borrowers is likely to improve the operation of credit markets as credit is assigned to households more likely to repay their debts. Overall, a negative coefficient on the coverage variables would suggest that households are more likely to repay their loans if other potential lenders are able to see their debt-repayment history.

3. ARREARS AND THEIR CONSEQUENCES

Before investigating the effect of institutions, we first assess the impact of arrears on home-ownership, employment, self-employment, and health up to four years after the initial incidence of the household falling into arrears. These outcomes can indicate some of the consequences that befall debtor households.

An important consideration is the timing of the arrears and of home-ownership, employment, self-employment, and health. For example, consider unemployment. Households may enter arrears and enter unemployment at the same time. To address this endogeneity issue, we use a dynamic specification in which we investigate the relationship between arrears between time $t-1$ and time t , and employment at time $t+1$, $t+2$, $t+3$, and $t+4$ (we follow the same procedure for home-ownership, self-employment, and health), and we estimate the model using random effects probit. We will also report results that condition on the employment status of the household at time t , by running separate regressions for the sample of households that are currently employed and currently unemployed. Since this specification is a flexible version of a dynamic probit regression, it suffers from an initial conditions problem (see Hyslop, 1999). To solve this we also run additional regressions that model the initial conditions. These regressions adopt the procedure of Wooldridge (2005), where the initial state of the left-hand-side variable is modelled as a function of the time-invariant variables as well as the time-varying variables in the initial time period. All the regressions include a full set of household characteristics. Table 4 reports separate regressions for three types of arrears: ‘any arrears’, mortgage arrears, and ‘other arrears’. Mortgage arrears are arrears on mortgage debt. ‘Other’ arrears are arrears to financial institutions and include arrears on credit card payments, hire-purchase agreements, and other financial loans made by banks. ‘Any arrears’, in addition to mortgage and ‘other’ arrears, includes arrears on utility bills and housing rent.

Table 4 reports results for employment up to four years after an incidence of arrears. The first panel shows results for the full regression sample. It shows a large and statistically significant effect of arrears on employment, even four years after the arrears occurred for either ‘any’ arrears or ‘other’ arrears. The coefficients also imply that the economic effects are large.² For example, ‘any’ arrears raise non-employment one year later by 2.5 percent, and the effect on employment is similarly large four years later. Moreover, arrears on ‘other’ debts raise non-employment one year later by 2.3 percent. Arrears on mortgage debt, on the other hand, do not have a significant effect on future employment. The effect one year ahead is only significant at the 10 percent level, but nevertheless, the coefficient implies that mortgage arrears reduce employment by 0.85 percent.

In these regressions, however, it is unclear whether certain household types are susceptible to both arrears and unemployment, or if such households become unemployed following the initial experience of arrears. Accordingly, the middle two panels of table 4 show separate results for households that, at time t , are currently employed and that are not currently employed (again not explicitly reporting the effect of the household characteristics). These results indicate that households that are currently employed are much less likely to be employed if they have recently had ‘any’ arrears, or arrears on ‘other financial debts’. Remarkably, the coefficients are similar in size for one and for four years ahead (and similar to the regressions in the top panel). In contrast, among those households not employed, mortgage arrears seem to show a strong and positive effect on employment one year ahead, perhaps because such households more actively seek employment to meet their mortgage expenses. However, the effect is significant only one year ahead, and becomes insignificant three or more years ahead.

The bottom panel of Table 4 reports results for full RE dynamic probit regressions. The results for unemployment remain significant one and two years ahead for ‘any’ arrears and for arrears on ‘other’ loans, but are no longer significant three or more years ahead (at least at the 5 percent level). Moreover, in the regressions that are significant, the size of the coefficients are around half those in the top panel. The effect of mortgage arrears remains statistically insignificant.³

In a similar manner, table 5 reports the effect of arrears on home-ownership up to four years into the future. Regardless of the type of debt for which the household is in arrears, the table shows that arrears sharply reduce the incidence of home-ownership. Indeed, the effect on home-ownership is stronger four years in the future than one year ahead. The coefficients imply, one year ahead, that ‘any’ arrears reduces home-owning by 1.9 percent, that mortgage arrears reduces home-owning by 1.5 percent, and that ‘other’ arrears reduces home-owning by 1.8 percent. Again, these effects seem large. In the middle two panels, the table compares current homeowners to current renters, and finds the effects are of similar size for both groups. That is, those households currently in arrears are much more likely to find themselves in the rented sector in the future regardless of whether they currently own their own home. The bottom panel reports results for full dynamic probit. Again the results are significant up to four years ahead for all three types of arrears

² To calculate the size of the effect we predicted the level of unemployment holding all variables at their current level except assuming first that the household was in arrears and then that the household was not in arrears (the household specific effect, by necessity, is held at zero). The difference between these two numbers was calculated to be the effect of arrears on unemployment. A similar procedure is adopted throughout the paper.

³ We have also estimated a ‘quasi-fixed effects model, in which the average value of the shock for each individual over all the time periods is included as an additional regressor. Except for the health consequences, the results (available on request) are similar to those reported here.

(although only at the 10 percent level for two- and four-years ahead for mortgage arrears). Moreover, the coefficients are, if anything, larger than those implied in the top panel.

One possible motivation for reforming the law regarding debtors that is often debated in the UK (and elsewhere) is to encourage entrepreneurial activity. Hence it is interesting to see how arrears affect self-employment. Table 6 shows that arrears have no significant overall effect on self-employment up to four years ahead, looking across all households. Moreover, the results are also not significant if we restrict attention to those households who are not currently self-employed. However, there is a significant decline in self-employment in the future among the currently self-employed. The coefficients are significant for ‘any’ arrears and for mortgage arrears up to four years ahead, and on other financial arrears up to two years ahead. Although not significant, the coefficient remains large four years ahead, as well. Having said so, the economic size of the effects is quite small. In the top panel, the coefficient implies that ‘any’ arrears reduces self-employment 0.25 percent, that mortgage arrears reduces self-employment by 0.45 percent, and that ‘other’ arrears reduces self-employment by 0.85 percent. The bottom panel of table 6 reports the RE dynamic probit results (accounting for the initial conditions). In these regressions the effect of arrears is significant one year ahead for all three types of arrears, and, for ‘other’ arrears, remains significant two years ahead. Moreover, the coefficients are around twice as large as in the top panel.

Table 7 investigates the effect of arrears on health. The results show that households who have ‘any arrears’ or arrears on ‘other loans’ are significantly more likely to be in bad health one year, two years, three years and four years after the incidence of arrears. The coefficient implies that ‘any’ arrears increases the incidence of bad health one year ahead by 1.6 percent (it approximately doubles), and that ‘other’ arrears increases bad health one year ahead by 1.9 percent (the point effect of mortgage arrears is 0.1 percent).

If we restrict attention to households currently in bad health, we can see no significant effect in the year following arrears, but the results become significant three years ahead for ‘any arrears’ and four years ahead for arrears on ‘other debts’. It seems that arrears are associated with a long-run failure to recover from bad health. For those households currently in good health, the effect of arrears makes households significantly more likely to report bad health in the future. This is also true for those households reporting mortgage arrears (although mortgage arrears have no significant effect for households currently in bad health). The bottom panel shows the full dynamic probit model estimates. It shows that ‘any’ arrears report significantly worse health up to four years ahead. However, the effect of mortgage arrears is only significant four years ahead, while ‘other’ arrears are only significant one and three years ahead. Nevertheless, the results in the bottom panel are broadly similar to those in the top panel (although the coefficients are slightly smaller).

3.1. Discussion

We have found that arrears have adverse long-term effects on households, even when we control for the status of the household. Arrears increase the difficulty of finding a job by workers not currently employed, and increase the probability of losing a job by those who are employed. The full RE dynamic probit results support these results (although the size of the effects is smaller). Arrears also decrease the likelihood of buying a home.

Households in arrears are less likely to remain self-employed, but our results show no effect on the probability of starting a business. In addition, households are much more likely to report bad health, even when good health was reported at the time of financial distress. Frequently, these effects persist: we have found that households still struggle even four years after falling into arrears.

The employment and health consequences of arrears raise many serious policy issues, but policy makers may be rather less concerned about homeownership. The results for the self-employed are also interesting. The findings cast doubt on the common argument that reducing the punishment for debtors will encourage entrepreneurial activity as we find that arrears do not influence whether workers who are not currently self-employed will start a business. Nevertheless, the bottom panel (using full dynamic probit) does lend some support to this argument since arrears decrease self-employment one year ahead (two years ahead in the case of ‘other’ arrears). We believe that the interpretation of the results is least ambiguous for those regarding health. Here the results are significant and may well concern policy makers if we believe that poor health is a direct consequence of the problems associated with the original arrears. Given the important consequences that households suffer after arrears, we believe it is crucial to analyze the decision of household default.

The interpretation of these results on the persistent effects of arrears is not straight forward. Fundamental to disentangling the various causes and effects of arrears is an understanding of why and under what circumstances households default. One interpretation is that household shocks are persistent: when households are hit by an idiosyncratic shock, the effect of the shock remains for several periods, especially important when considering unemployment or bad health shocks. Another view is that households who anticipate shocks, such as unemployment for example, may rationally react by not repaying their current debts, as predicted by Kocherlakota (1996) and by Kehoe and Levine (2001). However, this presumes that households are strategic about repayment, rather than the more typical view that arrears are a reaction to an adverse event. This provides an important motivation to our analysis of household default in the next section.

4. DETERMINANTS OF ARREARS: ADVERSE EVENTS AND INSTITUTIONS

4.1. Preliminary Descriptive Analysis

Before the formal regression analysis on determinants of arrears, it is useful to look at some simple sample statistics for arrears. We investigate how arrears are related to income and other adverse events, and how the responses to these adverse events differ between countries. Table 8 investigates the effect of home-ownership and of various shocks on the incidence of arrears. The table looks at all arrears including arrears on mortgage and rent, utility bills and on ‘other’ loans (financial loans including hire purchase debts). On average 6.64 percent of households are in arrears but this number is well over twice as high, at 11.57 percent, for renters compared to households that own their home. Obviously renters will not have mortgage arrears, but around 1.57 percent of home-owners are in arrears on

their mortgage. For other financial debts, some 3.57 percent of renters are in arrears, but the number is substantially lower, at 1.34 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 remainder of table 8 looks at how households react to various types of shock. It shows that households who have lost their job are almost twice as likely to be in arrears, compared to households who have not. For any debt, nearly 13 percent of recently unemployed households are in arrears compared with only 6.4 percent of households that did not lose their jobs. While the differences between the incidences of mortgage arrears are similar, they are nevertheless higher for those households who have suffered a job loss. These numbers are much larger for other debts: 3.39 percent of households that suffered unemployment shocks are in arrears compared to 1.88 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 the 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 over 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 compared to the previous year. These households are three times more likely to have missed any scheduled payment than those households who believe their income situation is either about the same as the previous year, or it has improved. These households are also more likely to be in arrears on their mortgage and on other debts.

To capture how these responses may vary across countries, table 9 presents summary statistics for the proportion of households in each country who are in arrears after each of the four possible adverse events. The table shows that in each of the countries, arrears are highly affected by adverse events but to varying degrees: over 34 percent of Greek households fall in arrears after an unemployment shock but only 3.5 percent of Dutch households fall into arrears as a result of the same shock. These differences are large. A primary goal of this paper is to explain this variation. We want to understand why households with similar shocks should be so much less likely to pay their debts on schedule in Greece than in the Netherlands.

4.2. Preliminary Regressions on the role of household characteristics

The descriptive statistics reported earlier hint at some of the determinants behind household debt repayment behaviour. In this section, we turn to a more thorough regression analysis, which also helps us control for the effect of other variables and allows us to better analyze the micro dynamics behind household arrears. Consequently, we start by exploring the effect of household characteristics at time t , on arrears between time t and $t+1$. Our regressions include age, age-squared, the number of children in the household, the interest rate, log-income in the previous period, and dummy variables indicating the marital status of the household head, 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. Similar regressions are reported by Boheim and Taylor (2000) and May and Tudela (2005) for arrears in the UK.

The regressions are carried out using the random effects probit model (fixed effects probit is ruled out by the short length of the panel). As we discuss below, random effects specification allows for the fact that households in different countries can have different propensities to fall behind on their repayments. Since this formulation includes a household specific fixed effect, we can not separately identify the effect of household specific variables that do not change over time (including country of residence). Throughout, the regressions are estimated using the full sample of households (rather than conditioning on the sample of borrowers). Modelling the selection decision of lenders would require finding suitable exclusion restrictions (see Grant and Padula, 2006), i.e. finding variables that affect the lending decision but not arrears. Any candidate exclusion restriction seems inherently implausible if we suppose that lenders restrict credit based on their assessment of likely repayment behaviour, in which case they would grant loans to relatively lower risk households. Hence we keep all the households in our sample. If lenders react to changes in institutions by reducing credit then our regressions results will underestimate the true effect of these institutions. In other words, our results will be a lower bound on the true effect of institutions on borrower behaviour.

Results for the basic regression are reported in the first column of table 10. It shows that the incidence of arrears increases with age but falls with age-squared, where age is measured in decades. The coefficients (although not significant) imply that arrears are highest for households aged around 50. Homeowners are significantly less likely to be in arrears than renters; the coefficient implies renters are four times more likely to be behind on their payments than homeowners. Although large, this effect is unsurprising since homeowners have an asset that could, in principle, be liquidated and used to repay the households debts. Couples are also less likely to be in arrears compared to singles, though the effect is smaller than the effect of home-ownership. The coefficients imply that couples 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 (measured using country specific 3-month money market interest rates) increases the incidence of arrears: a 1 percent increase in the interest rate increases the incidence of arrears in the population by 0.25 percent.

Table 10 also shows that log-income, measured at $t-1$, is highly significant in the regression. Households that are initially poorer are significantly more likely to miss scheduled debt payments between time t and $t+1$. 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. Therefore, 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 period t 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 that

temporarily poor households are more likely to borrow. Hence finding that poorer households at $t-1$ are more likely to be in arrears between t and $t+1$ is genuinely striking and need not be predicted from a strict interpretation of the life-cycle consumption model.

4.3. 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 section is devoted to this issue. However, we do not know whether the shocks were expected by the household, and hence they should be thought of as adverse events. We will use both descriptions interchangeably in the text. In the regressions the timing of adverse events and of arrears is crucial. The household is asked about their arrears during the past 12 months (e.g. the 12 months prior to the period in which the arrears were reported). Hence in our regressions, we measure the household's income at time $t-1$, the adverse event between time $t-1$ and t , and the subsequent arrears between time t and $t+1$.

The first adverse event we investigate is the effect of becoming unemployed. We also report results for the change in income: we investigate the effect of the percentage fall in income and also for 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. Households may behave differently if their income changed in a way that was expected, something that we, unfortunately, can not observe in the data. However, households are asked how their income situation compares with one year previously. We create a dummy that takes the value one if they report that their income situation has clearly deteriorated over the last year and zero otherwise. Unexpected changes in income are likely to be captured in this variable as discussed below.

The second column of table 10 reports the effect of an unemployment shock on 'any' arrears. The results show that the household characteristics included in the first column are mostly unchanged, and that households that report an unemployment shock are significantly more likely to be in arrears over the next year. In fact, if we held all the other characteristics constant, and compared households if they had received the shock and if they had not, then the unemployment shock would lead to an increase by around 1 percent in the level of 'any' arrears. The fourth column of table 10 includes the percentage fall in income that the household has experienced (with increases recorded as zero). We would expect households to be more likely to fall in arrears as they progressively experience larger decreases 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 shock, or adverse event, has increased the incidence of arrears. In the sixth column the shock or adverse event is a dummy for whether the household's real income has fallen significantly, defined as a fall of 7.5 percent or more. Again the effect of the adverse event is large and significant: the coefficient implies that having a significant fall in income increases arrears by 0.6 percent. Admittedly, the cut-off used here to define a "significant" drop in income is rather arbitrary. An alternative approach would be to use the residuals from an estimated earnings process to characterize income volatility. Estimating this, however, requires many more than the relatively few time periods in our data. However,

households do report whether they suffered an ‘unexpected fall in income’, which we hope captures whether the change in income was unexpected, we also investigate the effect of a health shock. Column (8) of table 10 reports the effect of a health shock, while column (10) shows the effect of reporting a ‘worsened income situation’. The results are very similar for both shocks: households who experience either a health shock or an income shock are significantly more likely to be in arrears. The estimated coefficients imply that a health shock increases the incidence of arrears by 0.8 percent, while an income shock increases arrears by 1 percent.

These results suggest that adverse events are strongly associated with arrears. In the third, fifth, and seventh, ninth and eleventh columns of table 10, the shock is interacted with country specific dummies. Since each regression is estimated by a random effects probit model, we have allowed for the fact that 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 country react to the different shocks. For example, when considering the fall in income (column 5), households in Ireland and Belgium are the most likely to react by falling into arrears, while households in the Netherlands, Portugal and Austria are the least likely to end up in arrears. A similar pattern can be seen for the other two shocks we investigate: in columns (7) and (11), 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.

Table 11 looks at mortgage arrears alone. The table shows that arrears increase with age and decrease with age-squared, as before. 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. Similarly, single households and couples are no more 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 12. 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, on the other hand, 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 debt repayments. Again, higher interest rates are associated with higher rates of arrears. Of the five different shocks we investigate, all except the health shock significantly increase arrears, although the implied marginal effect is smaller in the case of mortgage arrears. As for consumer loans, households that experience an adverse event frequently respond by falling behind on their repayment: for unemployment shocks, by 0.13 percent; for the negative income shock in column (3), by 0.07 percent; and by 0.13 percent in the last column. These numbers are large considering that only 1.95 percent of households have ‘other’ arrears. More striking, is that for all the shocks there are

significant differences in how households respond to these shocks in different countries, and this includes the health shock which wasn't itself significant.

4.4. Institutions, Adverse Events and Arrears

Tables 10–12 show that while there are differences in the incidence of arrears for households with different characteristics, in all cases adverse events make households significantly more likely to miss a scheduled debt payment. Households fall into arrears if their income has fallen or if their income situation has become worse. However, the degree to which households react to these adverse events differs substantially between countries.

A primary goal of this paper is to explain this variation. We want to understand why households with similar shocks should be so much less likely to pay their debts on schedule in Greece than in the Netherlands. Could it be related to the way that credit markets are regulated in these different countries, and the fact that households are more likely to default if they can be less effectively punished? To assess this, we investigate how some of the regulatory differences across countries are related to the incidence of arrears. We do this by exploiting the Doing Business measures of institutions in different countries (as reported in Box 1).

Ideally, we would also consider the evolution of these institutional variables over time. Unfortunately, there is no time-series variation in these variables for the relatively few years that are in the data. As a result in the regressions, these variables are indistinguishable from country fixed effects. Accordingly, our formulation includes these institutions interacted with the adverse events. This formulation implies that the effect of institutions on the general level of arrears in the country is included in the household dummy (throughout we report results for random effects probit regressions), while the interaction term shows how institutions mediate the effect of a shock on arrears. More specifically, where y_{it} is a dummy variable indicating if household i have missed a payment between period t and period $t+1$ (it takes the value one if the payment was missed and zero otherwise). Our regression analysis takes the following form:

$$\Pr(y_{it+1} = 1) = \Phi(\beta X_{it} + \theta S_{it} + \gamma I_i S_{it} + f_i + \varepsilon_{it}) \quad (4.4.1)$$

where X_{it} is a set of household characteristics and other controls that we discussed earlier (age, age-squared, the number of children in the household, dummy variables indicating the marital status of the household head, whether the household owns their home, whether the household head is self-employed, interest rate, log-household income in the previous period, as well as a full set of time dummies), S_{it} is a dummy for whether the household has suffered from a shock at time t , and I_i is the institutional arrangement where the household i lives. The f_i and ε_{it} capture the time invariant and time varying idiosyncratic errors, while β , γ , and θ are the parameters to be estimated. Finally, $\Phi(\bullet)$ denotes the cumulative normal distribution. Because we only observe whether household i missed a payment between time t and $t+1$, and because we have only 6 years of data, the model is estimated using the random effects probit model.

Relevant institutions are those pertaining to the legal enforcement of contracts. Hence, we investigate the effect on arrears of three 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 the cost of judicial proceedings ('cost') as described in the data section, as well as the number of procedures necessary to enforce the repayment of debts. On information sharing, we investigate the role of credit bureau coverage.

The results are reported in table 13 for each of our institutions and each of the three shocks. Since the effects of household characteristics are largely unchanged, they will not be discussed further. 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 have fallen are significantly more likely to have been in arrears. However, neither 'cost' nor 'time' seem to significantly affect the incidence of arrears. But the number of procedures does significantly reduce the incidence of arrears when the household's income falls: moving from the 14 to 27 procedures reduces arrears in the whole population by 0.1 percent. Both public and private coverage also have a highly significant effect. The coefficients imply that moving from no private or public coverage to complete private and public coverage would reduce the level of arrears in the population by 0.3 percent.

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: time, 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 has worsened, and the coefficients are again highly significant. Moreover, the estimated coefficient is always around 50 percent larger. The size of the coefficients in the last four columns suggests that increasing the number of procedures from 14 to 27 would reduce arrears by 0.28 percent, while changing the length of time from the lowest to the highest level in the sample would reduce arrears by 0.3 percent. A similar exercise for cost increases arrears by 0.45 percent.

The negative effect for 'time' and for 'number of procedures' is surprising. They both have the opposite sign to those predicted in Box 1. We would expect that an increase in the amount of time taken to recover debts would have reduced the incentives to pursue unpaid debts, thereby encouraging arrears. We would expect a similar effect as the number of procedures increases. However, lenders are likely to react by reducing the availability of credit in these cases. Accordingly, the coefficient provides a lower bound on the true effect. In other words, finding a negative effect suggests that the effect on credit supply dominates, causing arrears to fall.

Both public and private coverage have negative signs, which is consistent with the view that if any arrears become widely publicized then households become less willing to miss their payments. In other words, households care about their reputation and the potential punishment of, for example, being excluded from other credit agreements, and are less likely to default if other lenders can learn of their failure to repay their debts. 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. That is, the coverage of private credit bureaus may reduce default because they increase the penalty (or reputational cost) of defaulting, or they may reduce default because they facilitate better

borrower loan matches. Our regressions can not distinguish between these two explanations.

Tables 14 and 15 repeat 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 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). The response to cost and coverage of the self-reported deteriorating income situation is similar. However, the implied response to time is smaller (as well as being of the ‘wrong’ sign).

The response of 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.

5. CONCLUSIONS AND POLICY IMPLICATIONS

This paper has shown that arrears have long-term consequences for households. Those who fail to repay their debts on schedule are less likely to be employed, or home-owners, and are more likely to be in bad health. The evidence for the effect on self-employed is weaker. However, interpreting these results is not easy. They may signal the fact that most idiosyncratic shocks are persistent. Conversely, they may imply that households are likely to default if they anticipate employment difficulties at some future date. In either case, we believe that they signal the importance of testing for strategic behaviour on the part of borrowers, and of analyzing when households fall into arrears. We strongly believe that answering this question and understanding household debt repayment behaviour is all the more necessary given the current credit market turmoil.

Our results also indicate 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 or health. 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. This would seem to support the argument made by many policy professionals that repayment problems arise from a genuine inability to repay, and hence that the long-run consequences suffered by defaulting households ought to be of genuine concern. However, we have also shown that households in different countries respond differently to adverse shocks.

To explain these cross-country differences in arrears, we investigated the role of institutional factors that capture differences in how effectively default can be punished. Many papers, such as the papers by La Porta (1998), Guiso et al. (2004), and Jappelli et al. (2005), have found that institutional factors are important in explaining credit availability. This paper has shown that many of these factors are also important in explaining arrears. That is, the significant differences in how households in different countries react to these shocks are related to local financial and judicial institutions. However, institutions can

affect not only the repayment behaviour of debtors, but also the decision to borrow and the decision to lend. Creditors, if they anticipate that the debt is less likely to be repaid, will rationally place restrictions on what they lend. Thus our estimates are a lower bound on the effect of institutions. 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. Our results show that information sharing through either private credit bureaus or public registries is important particularly for unsecured consumer loans. They matter less in the case of mortgage repayment. Similarly, we have found that as the cost of the legal process increases (as a proportion of the debt), all the three types of arrears we investigate increase, especially when a household reports their income situation has become worse. However, the results are more ambiguous as the number of procedures to recover a debt increases. The results are negative for ‘any’ arrears, but positive for mortgage arrears. Only this second result is consistent with the prediction outlined in Box 1. Lastly, the results for ‘time’ are negative for all three types of arrears: a result that is consistent with the fact that the effect of reduced lending dominates the effect of increased incentives to arrears. Overall, we are able to show that for mortgage arrears two of the institutional factors that relate to judicial system (the number and cost of legal procedures) have the predicted effect. This last result maybe expected since collateral loans are more likely to be taken into court.

To summarize, this paper has shown that adverse shocks matter, but the extent to which the shock results in arrears depends crucially on the cost of default. With some institutions households default when they suffer an adverse event, while with other institutions, seemingly similar households repay their debts. 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 and the type of loan, (i.e. whether it is collateralized or unsecured). Consequently, this paper emphasizes that the decision to default is at least partly strategic, since the decision to repay depends on the type of institutions. Of course, this does not (necessarily) mean all households behave strategically, but that at least some households are responding to the institutions they face. This highlights the crucial role of institutions in mediating any adverse shock that the household suffers. Guiso et al. (2004) argue that reforming institutions help credit markets work more effectively and can provide a growth dividend if they improve the allocation of credit to businesses. Similarly, we argue that good institutions can enable creditors to recover their loans and hence improve the operation of consumer credit markets. Well functioning credit markets can, in turn, enable households to borrow when needed and to smooth their consumption over time, improving welfare.

These institutions differ widely across the European Union, and therefore credit markets operate differently across member countries. However, the European Commission has committed itself to creating a single market for consumer credit throughout Europe. We argue that it is crucial to understand the effect of different regulatory regimes on households' borrowing and repayment behaviours before finalizing the proposal to harmonize the regulation of household credit markets across the EU. Our results suggest that the design of appropriate institutions is an important consideration for the European Commission. In particular, the coverage of private credit bureaus or public registries unambiguously proves to be a significant determinant of repayment behaviour, especially

in the case of unsecured loans. Hence extensive information sharing across the EU is likely to become more important as workers become more mobile across countries, suggesting an important role for trans-national legislation.

Another important conclusion of our paper is that arrears are often the consequence of households that borrow being surprised by an adverse event, such as unemployment or ill health of a wage earner. Under such circumstances, it may well be optimal to allow such households to default on their debts. In other words, under incomplete markets, bankruptcy provisions could help households to insure against some of the income fluctuations. Of course, there are many other institutional arrangements that affect household consumption, borrowing, and default, besides those credit market institutions investigated in this paper. These include social insurance schemes, such as unemployment insurance, and employment legislation. The latter, for example, affects the incidence of default through increased protection from job losses (i.e., reduced labour income risk) and lowers the need for insurance through default. Athreya and Simpson (2006) is one of the first papers to demonstrate that public insurance and personal bankruptcy should be studied jointly. They show that generous insurance regains the ability to improve welfare when default is prohibited, or that generous bankruptcy law can be an important barrier to the efficacy of social insurance policies. Similarly, Grant and Koeniger (2007), study the interaction between bankruptcy and labour market risks.

Labour markets and labour market institutions differ widely throughout Europe. Accordingly, we believe that while there is some potential for cross-national legislation, as in the case of information sharing, credit market institutions and bankruptcy provisions should be allowed to differ across the EU based on the differences in available social insurance schemes. Grant and Koeniger (2007) shows how different US states have dramatically different rules about the assets that households can keep in bankruptcy, and also how they differ with respect to their social insurance schemes. Hence the exact nature of institutional arrangements will need to accommodate the specific needs of each country.

We, of course, acknowledge that these policy conclusions should be read cautiously, especially since the analysis is limited by the lack of time-series variation in the institutions. However, given the heightened debate in the press and among policy makers about rising levels of household debt and bankruptcies, we remain convinced that this paper makes an important contribution to understanding the micro-dynamics of repayment difficulties and the role of policies and institutions.

Box 1: Institutional Variables and Arrears

Several papers, including Kocherlakota (1996), Kehoe and Levine (2001), Athreya (2002), Chatterjee et al. (2007) and Livshits et al. (2007), have derived theoretical results about the default behaviour of households who have idiosyncratic income risk, can borrow, and are able to default on their debts. After borrowing, and receiving the income realisation, the household must decide whether to repay the loan. In these models, households default when they receive an adverse shock. More precisely, households compare the punishment for default with the benefit from renegeing on their debts and do not pay if it is advantageous not to do so. The results from these papers suggest that arrears are more likely after a negative shock, and when the debt is harder (or impossible) to recover. Hence we investigate several candidate institutions which are likely to affect repayment behaviour:

Time: the total number of calendar days it takes, on average, for dispute resolution. We would expect that increasing the amount of time that it takes to complete the judicial process is likely to mean that jurisdictions in which the court process takes longer are less effective at recovering debts, and thus there is less incentive for debtors to repay their debts on schedule.

No. of Procedures: the total number of legal procedures mandated by law that must be followed in order to legally recover a debt. As the number of procedures (or their complexity) increases, we would expect it to become more costly to enforce the debt, reducing the ease with which arrears can be punished, increasing the incentives for arrears.

Cost: the cost (as a percentage of the debt) of judicial proceedings. If the court process is costly, many creditors may prefer not to pursue repayment especially if the debt is small or the prospects of recovering the debt are low, hence increasing incentives for arrears.

Public Coverage: the proportion of the adult population who have information on their repayment history, unpaid debts or outstanding credit recorded in public credit registries.

Private Coverage: the proportion of the adult population who have information on their repayment history, unpaid debts or outstanding credit recorded by private credit bureaus. If other lenders will learn of any failure to repay the debts, then these households have greater incentive to repay their debts since it will more difficult for them to apply for a loan from alternative lenders.

TABLES

Table 1: Summary Statistics for the ECHP

	All		Borrowers	
	(mean)	(s.e.)	(mean)	(s.e.)
Age	44.47	7.98	43.33	7.60
Tertiary Education	0.19	0.39	0.23	0.42
Secondary Education	0.32	0.46	0.35	0.47
Less than Secondary Education	0.48	0.49	0.42	0.49
Homeowner	0.73	0.44	0.83	0.37
No. children	0.94	1.07	1.09	1.12
Couple	0.81	0.39	0.85	0.34
Single woman	0.09	0.29	0.07	0.26
Self-employed	0.17	0.38	0.14	0.35
Change in log-income	0.03	0.52	0.03	0.46
Negative income shock	0.26	0.44	0.26	0.43
Income situation better	0.19	0.39	0.23	0.43
Income situation worse	0.24	0.42	0.23	0.42
Unemployment shock	0.03	0.17	0.03	0.16
Negative health shock	0.02	0.15	0.02	0.14
Real interest rate	5.29	2.52	4.74	2.04
Sample size	101,984		55,389	
Avg. per country	8,425		4,615	

Notes: Columns under “All” show the summary statistics for the whole sample, while the last two columns report these only for the sub-sample of households with housing or non-housing debt.

Sources: Authors’ calculations based on the 1995–2001 waves of the ECHP.

Table 2: Some basic statistics on debt in the EU

Country	Mortgage			Any Arrears	Other Debt	
	Any Debt	Debt	Other Debt		Mortgage Arrears	Other Debt Arrears
Denmark	88.11	70.78	59.10	3.70	0.71	1.95
Netherlands	78.80	66.08	47.34	2.16	0.36	0.69
Belgium	67.51	55.04	29.29	9.02	4.41	3.31
France	70.22	44.48	45.04	9.54	1.13	2.70
Ireland	69.61	56.01	49.00	8.39	2.37	2.76
Italy	27.69	17.45	14.30	6.20	1.23	1.74
Greece	24.79	13.16	14.76	22.80	2.86	3.49
Spain	45.98	29.37	25.13	5.08	1.64	1.47
Portugal	32.44	21.58	16.12	2.93	0.29	1.68
Austria	46.21	35.00	17.37	2.20	0.46	1.23
Total	54.20	39.47	28.42	6.64	1.39	1.93

Notes: Any debt refers to the proportion of households holding any kind of debt. Mortgage refers to the proportion holding a mortgage. ‘Any Arrears’ refers to whether the household has missed a scheduled rent, mortgage, utility or hire-purchase payment in the last 12 months, while ‘Mortgage’ and ‘Other Debt’ refer to the proportion who have missed a mortgage or a other loan payment in the last 12 months.

Sources: Authors’ calculations based on the 1995–2001 waves of the ECHP.

Table 3: Institutions in Different EU countries

Country	Time (days)	Cost	No. Procedures	Private Coverage	Public Coverage
Denmark	83	3.8	15	7.7	0
Netherlands	48	0.5	22	68.9	0
Belgium	112	9.1	27	0	55.3
France	75	3.8	21	0	1.8
Ireland	217	7.2	16	100	0
Italy	1390	3.9	18	59.9	6.1
Greece	151	8.2	14	17.7	0
Spain	169	10.7	23	6.5	42.1
Portugal	320	4.9	24	9.8	64.3
Austria	374	1.0	20	45.4	1.2

Notes: Time is the average number of days to complete the judicial process; Number of procedures refers to the number of legal procedures that must be completed to recover a debt; while coverage refers to that of private credit bureaus and public credit bureaus. "Cost" is the cost of judicial proceedings in court fees and attorney fees, where the use of attorneys is mandatory or common, expressed as a percentage of the debt value. Public coverage and private coverage refer to the percentage of the population for which public registries and private credit bureaus have information on borrowers.

Sources: These data were downloaded from the Doing Business indicators website (www.doingbusiness.org) in May 2006.

Table 4: Impact of falling in arrears on future employment, full sample

	'Any' Arrears				Mortgage Arrears				Arrears on 'Other' Loans			
	(1) 1-year	(2) 2-year	(3) 3-year	(4) 4-year	(5) 1-year	(6) 2-year	(7) 3-year	(8) 4-year	(9) 1-year	(10) 2-year	(11) 3-year	(12) 4-year
Full Sample												
Arrears	-0.429*** (0.044)	-0.537*** (0.054)	-0.399*** (0.065)	-0.483*** (0.081)	-0.166* (0.095)	-0.097 (0.116)	-0.079 (0.143)	-0.253 (0.167)	-0.392*** (0.072)	-0.558*** (0.090)	-0.254** (0.113)	-0.451*** (0.136)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
No. Observations	83715	61540	43395	28675	83927	61712	43541	28784	83858	61650	43484	28745
No. households	22824	18880	15290	12477	22834	18886	15304	12493	22830	18885	15298	12490
Employed at time t												
Arrears	-0.345*** (0.039)	-0.447*** (0.060)	-0.254*** (0.074)	-0.387*** (0.086)	-0.258*** (0.083)	-0.149 (0.130)	-0.070 (0.155)	-0.281* (0.170)	-0.417*** (0.065)	-0.443*** (0.101)	-0.251** (0.127)	-0.463*** (0.144)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
No. Observations	69291	51710	36942	24684	69495	51879	37084	24790	69427	51816	37027	24749
No. households	19389	16206	13292	10933	19400	16213	13307	10949	19397	16213	13303	10947
Not-Employed at time t												
Arrears	0.092 (0.058)	-0.068 (0.089)	-0.064 (0.117)	0.077 (0.148)	0.286** (0.128)	0.372* (0.200)	-0.308 (0.282)	-0.397 (0.366)	-0.122 (0.105)	-0.455*** (0.162)	-0.104 (0.208)	-0.121 (0.280)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
No. Observations	14337	9759	6398	3951	14345	9762	6402	3954	14344	9763	6402	3956
No. households	6017	4440	3205	2250	6018	4441	3205	2250	6017	4441	3205	2252
Full Dynamic Model												
Arrears	-0.212*** (0.043)	-0.276*** (0.054)	-0.126* (0.067)	-0.153* (0.078)	-0.089 (0.092)	0.020 (0.116)	0.004 (0.141)	-0.114 (0.160)	-0.271*** (0.071)	-0.406*** (0.090)	-0.123 (0.113)	-0.200 (0.132)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
No. Observations	81242	59883	42308	28009	81440	60042	42444	28109	81378	59987	42393	28074
No. households	21953	18261	14840	12164	21963	18268	14855	12178	21959	18267	14850	12176

Notes: The first four columns show the effect of having any arrears (on loans, rent or utility) on employment one, two, three, and four periods into the future, respectively. Columns 5–8 repeat this for the effect of mortgage arrears alone, and columns 9–12 for arrears on other loans. All regressions include a full set of year dummies, and a set of controls for household characteristics and other variables (age, age-squared, no. children, couple, self-employed and home-owner where applicable, household income in previous period, and interest rate together with a constant). The sample includes all households in the top panel, only households who were employed at the time of arrears in the second panel, and those were not employed in the third panel. In the bottom panel the model is estimated including lagged employment and a full set of additional regressors to account for the initial conditions problem. We adopt the convention that * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent.

Sources: Authors' calculations based on the 1995–2001 waves of the ECHP.

Table 5: Impact of falling in arrears on future home-ownership

	Any Arrears				Mortgage Arrears				Arrears on 'Other' Loans			
	(1) 1-year	(2) 2-year	(3) 3-year	(4) 4-year	(5) 1-year	(6) 2-year	(7) 3-year	(8) 4-year	(9) 1-year	(10) 2-year	(11) 3-year	(12) 4-year
Full Sample												
Arrears	-0.251*** (0.029)	-0.328*** (0.037)	-0.430*** (0.052)	-0.426*** (0.071)	-0.195*** (0.064)	-0.244*** (0.083)	-0.327*** (0.117)	-0.382** (0.160)	-0.241*** (0.051)	-0.348*** (0.066)	-0.449*** (0.091)	-0.415*** (0.124)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	101972	74790	52580	34506	102210	74985	52740	34625	102131	74915	52679	34583
No. households	26959	22393	18243	14918	26967	22400	18255	14935	26964	22398	18251	14932
Home-owner at time t												
Arrears	-0.209*** (0.051)	-0.277*** (0.056)	-0.293*** (0.077)	-0.331*** (0.092)	-0.265*** (0.083)	-0.337*** (0.090)	-0.393*** (0.123)	-0.427*** (0.143)	-0.293*** (0.090)	-0.425*** (0.098)	-0.376*** (0.136)	-0.452*** (0.162)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	75005	54961	38557	25181	75246	55159	38715	25296	75149	55074	38646	25254
No. households	20510	16978	13766	11181	20523	16991	13780	11196	20516	16983	13771	11194
Renters at time t												
Arrears	-0.363*** (0.052)	-0.428*** (0.084)	-0.694*** (0.108)	-0.589*** (0.129)					-0.251*** (0.086)	-0.347** (0.140)	-0.763*** (0.186)	-0.463** (0.213)
Controls	yes	yes	yes	yes					yes	Yes	yes	yes
No. Observations	26967	19829	14023	9325					26982	19841	14033	9329
No. households	8720	7052	5555	4387					8720	7053	5558	4388
Full Dynamic Model												
Arrears	-0.277*** (0.036)	-0.349*** (0.059)	-0.455*** (0.075)	-0.396*** (0.101)	-0.238*** (0.076)	-0.224* (0.126)	-0.348** (0.168)	-0.404* (0.220)	-0.281*** (0.062)	-0.425*** (0.101)	-0.537*** (0.128)	-0.522*** (0.196)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	99037	72852	51350	33764	99260	73033	51499	33873	99188	72969	51443	33834
No. households	25945	21660	17730	14563	25953	21668	17743	14577	25951	21666	17740	14574

Notes: The first four columns show the effect of having any arrears (on loans, rent or utility) on future home-ownership one, two, three, and four periods into the future, respectively. Columns 5–8 repeat this for the effect of mortgage arrears alone, and columns 9–12 for arrears on other loans. All regressions include a full set of year dummies, and a set of controls for household characteristics and other variables (age, age-squared, no. children, couple, self-employed and home-owner—where applicable, household income in previous period, and interest rate together with a constant). The sample includes all households in the top panel, only households who were home-owners at time t in the second panel, and those were not home-owners in the third panel (who can not have mortgage arrears). In the bottom panel the model is estimated including lagged employment and a full set of additional regressors to account for the initial conditions problem. Throughout * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent. *Sources:* Authors' calculations based on the 1995–2001 waves of the ECHP

Table 6: Impact of falling in arrears on future self-employment

	Any Arrears				Mortgage Arrears				Arrears on 'Other' Loans			
	(1) 1-year	(2) 2-year	(3) 3-year	(4) 4-year	(5) 1-year	(6) 2-year	(7) 3-year	(8) 4-year	(9) 1-year	(10) 2-year	(11) 3-year	(12) 4-year
Full Sample												
Arrears	-0.043 (0.032)	0.002 (0.039)	0.034 (0.056)	-0.042 (0.073)	-0.074 (0.064)	-0.014 (0.076)	0.011 (0.107)	-0.097 (0.137)	-0.139** (0.061)	-0.114 (0.073)	-0.003 (0.102)	-0.057 (0.135)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	101986	74799	52584	34509	102224	74994	52744	34628	102145	74924	52683	34586
No. households	26960	22395	18243	14919	26968	22402	18255	14936	26965	22400	18251	14933
Self-employed at time t												
Arrears	-0.310*** (0.069)	-0.289*** (0.107)	-0.160 (0.143)	-0.442** (0.177)	-0.418*** (0.124)	-0.338* (0.182)	-0.556** (0.248)	-0.871*** (0.291)	-0.319*** (0.119)	-0.627*** (0.173)	-0.291 (0.251)	-0.306 (0.323)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	18162	13179	9130	5800	18188	13202	9144	5810	18178	13194	9140	5807
No. households	5814	4678	3760	2926	5815	4681	3761	2929	5814	4678	3761	2929
Not self-employed at time t												
Arrears	0.067 (0.046)	0.140** (0.059)	0.113* (0.067)	0.095 (0.079)	0.110 (0.092)	0.179 (0.117)	0.136 (0.138)	0.235 (0.155)	-0.060 (0.090)	0.094 (0.107)	0.141 (0.121)	0.063 (0.146)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	83824	61620	43454	28709	84036	61792	43600	28818	83967	61730	43543	28779
No. households	22831	18891	15300	12487	22841	18897	15314	12503	22837	18896	15308	12500
Full Dynamic Probit												
Arrears	-0.093** (0.041)	-0.030 (0.066)	0.029 (0.083)	-0.043 (0.106)	-0.171** (0.080)	-0.065 (0.121)	-0.033 (0.153)	-0.123 (0.191)	-0.194** (0.075)	-0.273** (0.116)	0.065 (0.145)	-0.040 (0.192)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	99051	72860	51353	33767	99274	73041	51502	33876	99202	72977	51446	33837
No. households	25946	21662	17730	14564	25954	21670	17743	14578	25952	21668	17740	14575

Notes: The first four columns show the effect of having any arrears (on loans, rent or utility) on future self-employment one, two, three, and four periods into the future, respectively. Columns 5–8 repeat this for the effect of mortgage arrears alone, and columns 9–12 for arrears on other loans. All regressions include a full set of year dummies, and a set of controls for household characteristics and other variables (age, age-squared, no. children, couple, self-employed and home-owner—where applicable, household income in previous period, and interest rate together with a constant). The sample includes all households in the top panel, only households who were self-employed at the time of arrears in the second panel, and those were not self-employed in the third panel. In the bottom panel the model is estimated including lagged employment and a full set of additional regressors to account for the initial conditions problem. Throughout * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent. *Sources:* Authors' calculations based on the 1995–2001 waves of the ECHP.

Table 7: Impact of falling in arrears on reporting bad health in the future

	Any Arrears				Mortgage Arrears				Arrears on 'Other' Loans			
	(1) 1-year	(2) 2-year	(3) 3-year	(4) 4-year	(5) 1-year	(6) 2-year	(7) 3-year	(8) 4-year	(9) 1-year	(10) 2-year	(11) 3-year	(12) 4-year
Full Sample												
Arrears	0.250*** (5.48)	0.261*** (4.76)	0.292*** (4.44)	0.391*** (4.77)	0.025 (0.26)	0.059 (0.51)	0.125 (0.90)	0.440*** (2.67)	0.291*** (3.86)	0.206** (2.20)	0.422*** (3.80)	0.295** (2.00)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	101611	74517	52386	34389	101845	74711	52546	34508	101768	74641	52485	34466
No. households	26932	22363	18219	14897	26940	22370	18231	14914	26937	22368	18227	14911
Good Health at time t												
Arrears	0.236*** (0.037)	0.260*** (0.043)	0.200*** (0.060)	0.270*** (0.071)	0.156* (0.080)	0.206** (0.090)	0.198 (0.122)	0.319** (0.138)	0.276*** (0.065)	0.314*** (0.075)	0.325*** (0.103)	0.082 (0.138)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	96145	70657	49778	32752	96371	70845	49933	32866	96298	70778	49875	32826
No. households	26194	21765	17724	14478	26199	21772	17736	14494	26198	21770	17733	14491
Bad Health at time t												
Arrears	-0.047 (0.076)	-0.016 (0.103)	0.322** (0.137)	0.310* (0.163)	-0.125 (0.171)	-0.275 (0.245)	-0.151 (0.325)	0.626 (0.412)	0.124 (0.130)	-0.203 (0.176)	0.274 (0.231)	0.608** (0.308)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	5204	3646	2467	1541	5210	3650	2470	1544	5206	3648	2468	1543
No. households	2706	2011	1472	1009	2707	2013	1473	1011	2705	2012	1472	1011
Full Dynamic Model												
Arrears	0.227*** (0.047)	0.232*** (0.057)	0.234*** (0.069)	0.320*** (0.087)	0.072 (0.097)	0.103 (0.117)	0.137 (0.144)	0.434** (0.172)	0.217*** (0.077)	0.122 (0.097)	0.345*** (0.116)	0.156 (0.157)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	Yes	yes	yes
No. Observations	98411	72390	51033	33575	98630	72570	51182	33684	98560	72506	51126	33645
No. households	25830	21554	17645	14501	25838	21562	17658	14515	25836	21560	17655	14512

Notes: The first four columns show the effect of having any arrears (on loans, rent or utility) on reporting bad health in the future (one, two, three, and four periods afterwards, respectively). Columns 5–8 repeat this for the effect of mortgage arrears alone, and columns 9–12 for arrears on other loans. All regressions include a full set of year dummies, and a set of controls for household characteristics and other variables (age, age-squared, no. children, couple, self-employed and home-owner—where applicable, household income in previous period, and interest rate together with a constant). The sample includes all households in the top panel, only households who reported good health at the time of arrears in the second panel, those who reported bad health in the third panel. In the bottom panel the model is estimated including lagged employment and a full set of additional regressors to account for the initial conditions problem. We adopt the convention that * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent. *Sources:* Authors' calculations based on the 1995–2001 waves of the ECHP.

Table 8: Percentage of Households in Arrears by Adverse Event

	Any Arrears	Arrears on Mortgages	Arrears on Other Debt
Overall	6.64	1.39	1.93
Renter	11.57	-	3.57
Home-owner	4.87	1.57	1.34
Unemployment Shock - No	6.44	1.35	1.88
Yes	12.77	2.64	3.39
Negative Income Shock - No	6.12	1.25	1.81
Yes	7.94	1.73	2.25
Negative Health Shock - No	6.49	1.36	1.90
Yes	12.81	2.26	3.09
Income Situation Worse - No	5.04	1.11	1.54
Yes	11.58	2.24	3.12

Notes: 'Any arrears' refers to the proportion of households who missed a mortgage payment, a loan payment, rent or a utility payment in the last 12 months, while 'Arrears on Mortgage' and 'Arrears on Other Debt' refer to the proportion who have only missed a mortgage or other loan payment, respectively.

Sources: Authors' calculations based on the 1995–2001 waves of the ECHP.

Table 9: Percentage of Households in Arrears by Adverse Event and by Country

Country	Unemployment Shock	Negative Income Shock	Negative Health Shock	Income Situation Worse
Denmark	6.62	5.54	9.42	6.10
Netherlands	3.50	3.28	9.17	4.88
Belgium	15.42	9.28	20.63	16.57
France	20.74	12.36	21.06	15.18
Ireland	15.97	7.91	17.02	14.49
Italy	11.54	7.31	11.44	10.26
Greece	34.61	24.38	34.28	33.95
Spain	12.03	6.03	13.71	8.68
Portugal	5.08	3.33	3.67	4.52
Austria	4.97	2.43	3.62	3.27

Notes: This table shows the arrears on any debt in each country when they experience an adverse event.

Sources: Authors' calculations based on the 1995–2001 waves of the ECHP.

Table 10: The Incidence of Household Arrears (s.e. in parenthesis)

	Basic	Unemployment Shock		Percentage Fall in Income		Large Fall in Income		Negative Health Shock		Income Situation Worse	
Age	0.247 (0.196)	0.284 (0.196)	0.282 (0.196)	0.340* (0.197)	0.344* (0.196)	0.348* (0.197)	0.336* (0.194)	0.239 (0.197)	0.231 (0.196)	0.210 (0.193)	0.224 (0.190)
age-squared	-0.026 (0.022)	-0.031 (0.022)	-0.031 (0.022)	-0.036* (0.022)	-0.037* (0.022)	-0.038* (0.022)	-0.036* (0.022)	-0.025 (0.022)	-0.025 (0.022)	-0.023 (0.022)	-0.025 (0.021)
Homeowner	-0.587*** (0.029)	-0.586*** (0.029)	-0.587*** (0.029)	-0.581*** (0.030)	-0.583*** (0.029)	-0.582*** (0.029)	-0.582*** (0.029)	-0.586*** (0.029)	-0.585*** (0.029)	-	-0.574*** (0.028)
no. children	0.190*** (0.014)	0.190*** (0.013)	0.189*** (0.014)	0.189*** (0.014)	0.188*** (0.014)	0.189*** (0.014)	0.187*** (0.014)	0.190*** (0.014)	0.191*** (0.014)	0.185** (0.014)	0.184*** (0.014)
Couple	-0.291*** (0.037)	-0.291*** (0.037)	-0.291*** (0.037)	-0.250*** (0.037)	-0.250*** (0.037)	-0.258*** (0.037)	-0.251*** (0.037)	-0.289*** (0.037)	-0.288*** (0.037)	-	-0.263*** (0.036)
self-employed	0.025 (0.034)	-0.049 (0.034)	-0.051 (0.034)	-0.014 (0.034)	-0.014 (0.034)	0.002 (0.034)	0.001 (0.034)	0.025 (0.034)	0.027 (0.034)	0.030 (0.033)	0.032 (0.033)
interest rate	0.124*** (0.005)	0.124*** (0.005)	0.123*** (0.005)	0.123*** (0.005)	0.122*** (0.005)	0.123*** (0.005)	0.119*** (0.005)	0.125*** (0.005)	0.125*** (0.005)	0.120** (0.005)	0.111*** (0.005)
ln-income	-3.142*** (0.188)	-3.119*** (0.187)	-3.122*** (0.187)	-3.710*** (0.196)	-3.751*** (0.196)	-3.820*** (0.196)	-3.807*** (0.194)	-3.111*** (0.188)	-3.111*** (0.188)	-	-3.229*** (0.186)
Shock		0.343*** (0.045)		0.253*** (0.024)		0.253*** (0.022)		0.281*** (0.053)		0.365** (0.022)	
shock x Denmark			0.047 (0.231)		0.389** (0.176)		0.187** (0.084)		0.284 (0.229)		0.116 (0.104)
x Neth.			-0.212 (0.205)		0.014 (0.120)		-0.024 (0.074)		0.269 (0.191)		0.043 (0.075)
x Belgium			0.381** (0.178)		0.536*** (0.085)		0.444*** (0.064)		0.439*** (0.199)		0.750*** (0.070)
x France			0.568*** (0.099)		0.446*** (0.059)		0.496*** (0.045)		0.551*** (0.110)		0.664*** (0.043)
x Ireland			0.583*** (0.172)		0.634*** (0.151)		0.323*** (0.075)		0.302 (0.224)		0.372*** (0.081)
x Italy			0.307*** (0.104)		0.226*** (0.051)		0.198*** (0.046)		0.224* (0.122)		0.199*** (0.045)
x Greece			0.669*** (0.145)		0.459*** (0.079)		0.475*** (0.057)		0.173 (0.228)		0.816*** (0.056)
x Spain			0.284** (0.110)		0.165*** (0.041)		0.157*** (0.053)		0.455*** (0.144)		0.196*** (0.058)
x Portugal			-0.071 (0.090)		-0.034 (0.094)		-0.254*** (0.084)		-0.345* (0.189)		-0.253*** (0.076)
x Austria			0.150 (0.233)		0.050 (0.165)		-0.215* (0.110)		-0.236 (0.313)		-0.169 (0.109)
Country Diff. (p-value)			85.41 (0.000)		174.21 (0.000)		281.63 (0.000)		52.52 (0.000)		607.62 (0.000)

Notes: Estimated using Random Effects Probit regression using the 1995–2000 waves of the ECHP. All regressions include a full set of year dummies. The type of shock is written over the columns, so that the shock is an unemployment shock in cols (2) and (3) etc. “Country Diff.” is a joint test for whether the country dummies, interacted with the shock, are significantly different from zero. We adopt the convention that * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent.

Sources: Authors’ calculations based on the 1995–2001 waves of the ECHP.

Table 11: The Incidence of Mortgage Arrears (s.e. in parenthesis)

	Basic	Unemployment Shock	Percentage Fall in Income	Large Fall in Income	Negative Health Shock	Income Situation Worse					
Age	1.076*** (0.347)	1.220*** (0.378)	1.114*** (0.348)	1.150*** (0.352)	1.147*** (0.349)	1.258*** (0.380)	1.197*** (0.369)	1.095*** (0.349)	1.080*** (0.358)	1.059*** (0.347)	1.005*** (0.347)
Age-squared	-0.127*** (0.039)	-0.145*** (0.043)	-0.132*** (0.039)	-0.136*** (0.040)	-0.135*** (0.039)	-0.149*** (0.043)	-0.141*** (0.042)	-0.130*** (0.039)	-0.128*** (0.039)	-0.126*** (0.039)	-0.120*** (0.039)
no. children	0.110*** (0.023)	0.117*** (0.026)	0.109*** (0.023)	0.111*** (0.024)	0.110*** (0.023)	0.119*** (0.026)	0.113*** (0.025)	0.111*** (0.023)	0.110*** (0.023)	0.107*** (0.023)	0.107*** (0.023)
Couple	-0.008 (0.065)	-0.004 (0.072)	-0.007 (0.065)	0.014 (0.066)	0.020 (0.066)	0.022 (0.072)	0.019 (0.069)	-0.012 (0.065)	-0.013 (0.065)	-0.002 (0.065)	0.016 (0.066)
self-employed	0.189*** (0.055)	0.232*** (0.060)	0.216*** (0.055)	0.151** (0.056)	0.146*** (0.056)	0.180*** (0.061)	0.173*** (0.059)	0.181*** (0.055)	0.184*** (0.055)	0.193*** (0.055)	0.200*** (0.055)
interest rate	0.043*** (0.009)	0.045*** (0.009)	0.040*** (0.009)	0.041*** (0.009)	0.041*** (0.009)	0.045*** (0.009)	0.042*** (0.010)	0.043*** (0.009)	0.044*** (0.009)	0.039*** (0.009)	0.042*** (0.010)
ln-income	-1.828*** (0.309)	-1.833*** (0.334)	-1.798*** (0.311)	-2.187*** (0.328)	-2.238*** (0.325)	-2.380*** (0.350)	-2.366*** (0.341)	-1.744*** (0.313)	-1.739*** (0.313)	-1.725*** (0.311)	-1.835*** (0.312)
Shock		0.358*** (0.086)		0.198*** (0.037)		0.232*** (0.040)		0.215** (0.101)		0.281*** (0.039)	
Country Diff. (p-value)			36.20 (0.000)		76.14 (0.000)		86.70 (0.000)		33.82 (0.000)		158.89 (0.000)

Notes: Estimated using Random Effects Probit regression using the 1995–2000 waves of the ECHP. All regressions include a full set of year dummies. The type of shock is written over the columns, so that the shock is an unemployment shock in cols (2) and (3) etc. “Country Diff.” is a joint test for whether the country dummies, interacted with the shock, are significantly different from zero. We adopt the convention that * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent.

Sources: Authors’ calculations based on the 1995–2001 waves of the ECHP.

Table 12: The Incidence of Arrears on ‘Other’ Debts (s.e. in parenthesis)

	Basic	Unemployment Shock	Percentage Fall in Income	Large Fall in Income	Negative Health Shock	Income Situation Worse					
Age	0.325 (0.254)	0.349 (0.254)	0.344 (0.254)	0.372 (0.255)	0.386 (0.255)	0.384 (0.254)	0.389 (0.253)	0.301 (0.255)	0.303 (0.255)	0.301 (0.251)	0.322 (0.249)
age-squared	-0.040 (0.029)	-0.044 (0.029)	-0.043 (0.029)	-0.046 (0.029)	-0.048* (0.029)	-0.048* (0.029)	-0.048* (0.028)	-0.038 (0.029)	-0.038 (0.029)	-0.039 (0.028)	-0.041 (0.028)
home-owner	-0.520*** (0.037)	-0.519*** (0.037)	-0.519*** (0.037)	-0.515*** (0.037)	-0.518*** (0.037)	-0.514*** (0.037)	-0.513*** (0.037)	-0.523*** (0.037)	-0.523*** (0.037)	-0.507*** (0.037)	-0.512*** (0.036)
no. children	0.163*** (0.017)	0.164*** (0.017)	0.163*** (0.017)	0.163*** (0.017)	0.164*** (0.017)	0.163*** (0.017)	0.162*** (0.017)	0.165*** (0.017)	0.165*** (0.017)	0.161*** (0.017)	0.154*** (0.017)
Couple	-0.183*** (0.047)	-0.183*** (0.047)	-0.183*** (0.047)	-0.166*** (0.047)	-0.157*** (0.047)	-0.165*** (0.047)	-0.154*** (0.047)	-0.177*** (0.047)	-0.174*** (0.047)	-0.178*** (0.046)	-0.157*** (0.046)
self-employed	0.049 (0.044)	0.065 (0.044)	0.064 (0.044)	0.024 (0.045)	0.023 (0.045)	0.033 (0.044)	0.036 (0.044)	0.049 (0.044)	0.051 (0.045)	0.051 (0.044)	0.057 (0.043)
interest rate	0.037*** (0.007)	0.037*** (0.007)	0.037*** (0.007)	0.037*** (0.007)	0.040*** (0.007)	0.037*** (0.007)	0.040*** (0.007)	0.037*** (0.007)	0.038*** (0.007)	0.033*** (0.007)	0.039*** (0.007)
ln-income	-1.736*** (0.255)	-1.699*** (0.255)	-1.703*** (0.256)	-1.971*** (0.264)	-2.024*** (0.264)	-2.080*** (0.265)	2.095*** (0.262)	-1.725*** (0.257)	1.717*** (0.257)	-1.642*** (0.254)	-1.710*** (0.256)
Shock		0.261*** (0.066)		0.155*** (0.034)		0.163*** (0.031)		0.097 (0.080)		0.267*** (0.030)	
Country Diff. (p-value)			27.15 (0.003)		65.09 (0.000)		96.00 (0.000)		21.59 (0.017)		147.78 (0.000)

Notes: Estimated using Random Effects Probit regression using the 1995–2001 waves of the ECHP. All regressions include a full set of year dummies. The type of shock is written over the columns, so that the shock is an unemployment shock in cols (2) and (3) etc. “Country Diff.” is a joint test for whether the country dummies, interacted with the shock, are significantly different from zero. We adopt the convention that * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent.

Sources: Authors’ calculations based on the 1995–2001 waves of the ECHP.

Table 13: Institutions and Any Arrears (standard errors in parenthesis)

	Percentage Fall in Income				Large Fall in Income				Income Situation Worse			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Age	0.338*	0.340*	0.344*	0.340*	0.343*	0.349*	0.351	0.341*	0.209	0.199	0.219	0.207
	(0.197)	(0.197)	(0.197)	(0.197)	(0.197)	(0.196)	(0.197)	(0.196)	(0.192)	(0.192)	(0.193)	(0.192)
age-squared	-0.037*	-0.037*	-0.037*	-0.037*	-0.037*	-0.038*	-0.038	-0.037*	-0.023	-0.022	-0.025	-0.023
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.021)
home-owner	-0.582***	-0.582***	-0.581***	-0.580***	-0.582***	-0.586***	-0.582***	-0.576***	-0.573***	-0.580***	-0.573***	-0.567***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.028)	(0.029)	(0.029)	(0.029)
no. children	0.189***	0.189***	0.189***	0.189***	0.189***	0.189***	0.189***	0.190***	0.183***	0.184***	0.185***	0.188***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Couple	-0.259***	-0.260***	-0.258***	-0.255***	-0.256***	-0.260***	-0.257***	-0.252***	-0.271***	-0.282***	-0.283***	-0.272***
	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)	(0.036)	(0.037)	(0.036)
self-employed	-0.014	-0.014	-0.016	-0.012	0.003	0.001	0.001	0.005	0.029	0.027	0.029	0.033
	(0.035)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)	(0.033)	(0.033)	(0.034)	(0.033)
interest rate	0.123***	0.123***	0.122***	0.122***	0.124***	0.121***	0.121***	0.122***	0.123***	0.116***	0.116***	0.118***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)
ln-income	-3.700***	-3.708***	-3.733***	-3.726***	-3.800***	-3.817***	-3.826***	-3.797***	-3.123***	-3.069***	-3.070***	-3.147***
	(0.196)	(0.197)	(0.196)	(0.196)	(0.196)	(0.196)	(0.196)	(0.196)	(0.186)	(0.185)	(0.186)	(0.185)
Shock	0.275***	0.244***	0.569***	0.439***	0.288***	0.130***	0.505***	0.449***	0.452***	0.154***	0.761***	0.676***
	(0.030)	(0.051)	(0.145)	(0.050)	(0.026)	(0.041)	(0.105)	(0.036)	(0.026)	(0.042)	(0.110)	(0.069)
Shock x Time	-0.005				-0.009**				-0.023***			
	(0.005)				(0.004)				(0.004)			
Shock x Cost		0.001				0.022***				0.038***		
		(0.007)				(0.006)				(0.006)		
Shock x No. Procedures			-0.015**				-0.013**				-0.020***	
			(0.007)				(0.005)				(0.005)	
Shock x Private Cov.				-0.307***				-0.392***				-0.664***
				(0.099)				(0.068)				(0.069)
Shock x Public Cov.				-0.481***				-0.531***				-0.804***
				(0.116)				(0.093)				(0.093)

Notes: Estimated using Random Effects Probit regression using the 1995–2001 waves of the ECHP. All regressions include a full set of year dummies. Time is the number of days on average to complete the legal process; Cost is the proportion of the principle it costs to recover the debt; No. Procedures is the number of procedures to complete the legal process; while Coverage is the coverage of private credit bureaus or public registries, respectively. We adopt the convention that * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent.

Sources: Authors' calculations based on the 1995–2001 waves of the ECHP.

Table 14: Institutions and Mortgage Arrears (standard errors in parenthesis)

	Percentage Fall in Income				Large Fall in Income				Income Situation Worse			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
age	1.157*** (0.355)	1.014*** (0.351)	1.241*** (0.380)	1.144*** (0.351)	1.156*** (0.349)	1.153*** (0.351)	1.162*** (0.352)	1.162*** (0.351)	1.070*** (0.351)	1.055*** (0.360)	1.066*** (0.363)	1.112*** (0.369)
age-squared	-0.136*** (0.040)	- (0.040)	- (0.043)	- (0.040)	- (0.039)	- (0.040)	- (0.040)	- (0.040)	- (0.040)	- (0.041)	- (0.041)	-0.133*** (0.042)
no. children	0.112*** (0.024)	0.111*** (0.024)	0.118*** (0.026)	0.111*** (0.024)	0.111*** (0.023)	0.111*** (0.024)	0.112*** (0.024)	0.112*** (0.024)	0.107*** (0.024)	0.108*** (0.024)	0.110*** (0.025)	0.115*** (0.025)
couple	0.013 (0.067)	0.011 (0.066)	0.021 (0.072)	0.012 (0.066)	0.016 (0.066)	0.009 (0.066)	0.015 (0.066)	0.014 (0.066)	0.005 (0.066)	-0.001 (0.068)	0.001 (0.067)	0.003 (0.070)
self-employed	0.150*** (0.057)	0.152*** (0.056)	0.165*** (0.061)	0.147** (0.056)	0.165*** (0.055)	0.161*** (0.056)	0.165*** (0.056)	0.165*** (0.056)	0.195*** (0.056)	0.197*** (0.057)	0.199*** (0.058)	0.205*** (0.059)
interest rate	0.041*** (0.009)	0.041*** (0.009)	0.044*** (0.010)	0.042*** (0.009)	0.042*** (0.009)	0.037*** (0.009)	0.043*** (0.009)	0.042*** (0.009)	0.042*** (0.009)	0.043*** (0.009)	0.047*** (0.010)	0.043*** (0.009)
ln-income	-2.203*** (0.331)	- (0.327)	- (0.351)	2.195*** (0.327)	- (0.324)	- (0.327)	- (0.327)	- (0.327)	- (0.315)	- (0.322)	- (0.322)	-1.777*** (0.330)
shock	0.172*** (0.047)	0.063 (0.089)	0.200 (0.261)	0.045*** (0.106)	0.236*** (0.046)	-0.089 (0.076)	0.037 (0.186)	0.203*** (0.071)	0.349*** (0.047)	-0.138* (0.080)	-0.310 (0.202)	0.343*** (0.073)
Shock x Time	0.006 (0.007)				-0.004 (0.007)				-0.015** (0.007)			
Shock x Cost		0.017 (0.010)				0.051*** (0.010)				0.071*** (0.011)		
Shock x No. Procedures			0.000 (0.012)				0.009 (0.009)				0.029*** (0.010)	
Shock x Priv. Coverage				0.280 (0.183)				-0.053 (0.122)				-0.331** (0.135)
Shock x Pub. Coverage				0.314 (0.227)				0.172 (0.162)				0.164 (0.169)

Notes: Estimated using Random Effects Probit regression using the 1995–2001 waves of the ECHP. All regressions include a full set of year dummies. Time is the number of days on average to complete the legal process; Cost is the proportion of the principle it costs to recover the debt; No. Procedures is the number of procedures to complete the legal process; while Coverage is the coverage of private credit bureaus or public registries, respectively. We adopt the convention that * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent.
Sources: Authors' calculations based on the 1995–2001 waves of the ECHP.

Table 15: Institutions and ‘Other’ Arrears (standard errors in parenthesis)

	Percentage Fall in Income				Large Fall 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)	0.373 (0.255)	0.372 (0.255)	0.384 (0.254)	0.385 (0.254)	0.384 (0.255)	0.377 (0.254)	0.301 (0.251)	0.286 (0.250)	0.300 (0.251)	0.296 (0.250)
age-squared	-0.046 (0.029)	-0.046 (0.029)	-0.046 (0.029)	-0.046 (0.029)	-0.048* (0.029)	-0.048* (0.029)	-0.048* (0.029)	-0.047 (0.029)	-0.039 (0.028)	-0.037 (0.028)	-0.039 (0.028)	-0.038 (0.028)
Homeowner	-0.515*** (0.037)	-0.515*** (0.037)	-0.515*** (0.037)	-0.514*** (0.037)	-0.514*** (0.037)	-0.516*** (0.037)	-0.514*** (0.037)	-0.509*** (0.037)	-0.507*** (0.037)	-0.513*** (0.037)	-0.506*** (0.037)	-0.505*** (0.037)
no. children	0.163*** (0.017)	0.163*** (0.017)	0.163*** (0.017)	0.164*** (0.017)	0.163*** (0.017)	0.163*** (0.017)	0.164*** (0.017)	0.164*** (0.017)	0.160*** (0.017)	0.159*** (0.017)	0.161*** (0.017)	0.161*** (0.017)
Couple	-0.168*** (0.047)	-0.166*** (0.047)	-0.166*** (0.047)	-0.163*** (0.047)	-0.165*** (0.047)	-0.165*** (0.047)	-0.165*** (0.047)	-0.161*** (0.047)	-0.172*** (0.046)	-0.177*** (0.046)	-0.178*** (0.046)	-0.175*** (0.046)
self-employed	0.023 (0.045)	0.023 (0.045)	0.024 (0.045)	0.025 (0.045)	0.033 (0.044)	0.032 (0.044)	0.033 (0.044)	0.036 (0.044)	0.051 (0.044)	0.049 (0.044)	0.051 (0.044)	0.053 (0.044)
interest rate	0.036*** (0.007)	0.037*** (0.007)	0.037*** (0.007)	0.036*** (0.007)	0.037*** (0.007)	0.036*** (0.007)	0.037*** (0.007)	0.036*** (0.007)	0.035*** (0.007)	0.029*** (0.007)	0.034*** (0.007)	0.033*** (0.007)
ln-income	-1.976*** (0.264)	-1.980*** (0.264)	-1.974*** (0.264)	-1.990*** (0.264)	-2.079*** (0.265)	-2.079*** (0.265)	-2.079*** (0.265)	-2.062*** (0.264)	-1.677*** (0.254)	-1.636*** (0.253)	-1.642*** (0.254)	-1.663*** (0.254)
shock	0.132*** (0.044)	0.196*** (0.070)	0.211 (0.212)	0.290*** (0.070)	0.165*** (0.037)	0.097* (0.056)	0.154 (0.153)	0.292*** (0.051)	0.310*** (0.036)	0.092* (0.056)	0.238 (0.157)	0.341*** (0.050)
Shock x Time	0.005 (0.006)				-0.001 (0.006)				-0.011** (0.005)			
Shock x Cost		-0.006 (0.009)				0.012 (0.008)				0.033*** (0.009)		
Shock x No. Procedures			-0.003 (0.010)				0.000 (0.007)				0.001 (0.008)	
Shock x Priv. Coverage				-0.192 (0.138)				-0.295*** (0.095)				-0.175* (0.093)
Shock x Pub. Coverage				-0.368** (0.165)				-0.274** (0.128)				-0.145 (0.123)

Notes: Estimated using Random Effects Probit regression using the 1995–2001 waves of the ECHP. All regressions include a full set of year dummies. Time is the number of days on average to complete the legal process; Cost is the proportion of the principle it costs to recover the debt; No. Procedures are the number of procedures to complete the legal process; while Coverage is the coverage of private credit bureaus or public registries, respectively. We adopt the convention that * means significant at 10 percent, ** significant at 5 percent, and *** significant at 1 percent.

Sources: Authors’ calculations based on the 1995–2001 waves of the ECHP.

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