CFCM

CENTRE FOR FINANCE AND CREDIT MARKETS

Working Paper 09/03

Income Shocks, Mortgage Repayment Risk and Financial Distress Among UK Households

John Gathergood

Produced By:

Centre for Finance and Credit Markets
School of Economics
Sir Clive Granger Building
University Park
Nottingham
NG7 2RD

Tel: +44(0) 115 951 5619
Fax: +44(0) 115 951 4159
enquiries@cfcm.org.uk

CFCM

1 May 2009

Income Shocks, Mortgage Repayment Risk and Financial Distress Among UK Households

John Gathergood*

Abstract

This paper examines the prevalence of mortgage arrears in the U.K using the British Household Panel Survey (BHPS). The majority of reported problems occur in the first few years after purchase. Episodes of unemployment, long-term sickness or relationship breakdown all predict repayment difficulties, as well as measures of leverage and income gearing at the point of origination. Using proxy measures for unemployment risk, ill-health risk and separation risk at the time of purchase, constructed from a variety of instruments, repayment difficulties are shown to be strongly correlated with *ex ante* repayment risk. This result raises questions about the efficiency of the mortgage lending process and the possibility that a significant proportion of mortgage arrears and defaults could be prevented by improved screening of repayment risk at the time of application.

* ESRC Postdoctoral Research Fellow, Centre for Finance and Credit Markets, School of Economics, University of Nottingham.

Correspondence: john.gathergood@nottingham.ac.uk. School of Economics, Sir Clive Granger Building, University Park, Nottingham. NG7 2RD. Tel: +44(0) 1158466447.

I should like to thank the Economic and Social Research Council for funding my postdoctoral award.

INCOME SHOCKS, MORTGAGE REPAYMENT RISK AND FINANCIAL DISTRESS AMONG UK HOUSEHOLDS

1. Introduction

It is widely accepted that household mortgage defaults to have played a major role in the origins of the current recessions in both the U.K. and the U.S. However, the causes of household mortgage repayment difficulties in these nations are under-researched. Few studies have, until recently, examined the causes of mortgage arrears, default and foreclosure, especially caused by adverse 'shocks' to household finances or by predictable events and circumstances. Following the recent U.S. experience, howeverm a growing number of studies are emerging on the causes of mortgage defaults by U.S. households, including papers on the role of the structure of mortgage lending contracts in promoting foreclosures (White, 2008; Foote, 2008), the foreclosure-price fall spiral, (Calormis, 2008) and the option value of foreclosure to households (Bajari, 2008). A large theoretical literature addresses mortgage default from an option-value perspective (see Deng *et al*., 2000) Perhaps surprisingly, fewer studies focus on the causes of repayment difficulties at the individual level, such as the role of falling incomes due to unemployment, increased debt burdens on the mortgage holder due to relationship breakdown, or reduced capacity for work caused by ill health.

The absence of such studies for the U.S. has most likely arisen due to the lack of available data on such types of shocks to household income alongside data on household mortgage arrears and repayment difficulties. Individual-level, high frequency panel data on mortgage loan terms and performance is available from institutional sources, as in Bajari, 2008, but such sources lack information on socio-economic background and characteristics. Elsewhere household panel data is available in the Panel Study of Income Dynamics (PSID), including

household labour market participation, health status and finances, with some mortgage details, but not including data on repayment difficulties or mortgage arrears on a regular basis. Hence studies on mortgage repayment and default are limited to cross-sectional data, occasional surveys and institutional data with limited information on the forms of income household shocks which most likely cause default.

By contrast, rich U.K. panel data is available on household mortgage borrowing and repayment performance, plus socio-demographic characteristics, labour market participation, health status and repayment of non-mortgage credit. This allows an analysis of the relationship between various forms of *pre-purchase* income risk and *post-purchase* income changes on household mortgage repayment difficulties. Existing studies have examined the relationship between changes in household income arising from a variety of sources (such as job loss, breakdown of the household unit and ill-health) on mortgage arrears and repayment for the U.K. (Boheim and Taylor, 2000; May and Tudela, 2005; Bridges and Disney, 2004) and for a panel of E.U. nations (Duygan and Grant, forthcoming).

This paper offers two innovations to these existing studies. Firstly, it distinguishes between the types of 'shocks' which cause repayment difficulties. This is made possible by the range of information on socio-economic characteristics present in the BHPS. Secondly, the paper explores to what extent repayment difficulties are related to the underlying risk that households experience such a 'shock' at the point of purchase. Proxies for unemployment risk, ill health risk and relationship breakdown risk (at the point of purchase and based on a number of relevant instruments) are estimated and shown to be statistically and economically significant as predictors of mortgage repayment difficulties. These results raise pertinent questions about the extent of information asymmetries between borrowers and lenders and the efficiency of the mortgage lending process.

The British Household Panel Survey (BHPS) used here, modelled on the PSID, contains a series of detailed questions on self-reported household difficulties in paying for housing, on the burden of housing payments on the household's budget and on the extent of arrears on mortgage payments. These questions are asked in every wave, together with questions on the respondent's financial expectations over the coming year and financial experience over the previous year. As an annual household survey, the BHPS does not contain data on mortgage repayment performance of the same frequency as that held by mortgage lenders, but the combination of mortgage payment questions together with a broader set of economic covariates make this data suitable for a study on the causes of household repayment difficulties.

The policy-relevance of research on the causes of mortgage repayment difficulties has rarely been more apparent. Difficulty meeting mortgage payments is one of the most significant causes of financial distress to households. Mortgage borrowing typically represent the largest debts owed by the households, are secured upon the most valuable durable good and single investment asset owned by the household and are the dominant debt service cost met by household income (on the magnitude of housing assets and debt in U.S. and U.K. household balance sheets see Banks *et al.*, 2003). The welfare consequences of mortgage repayment difficulties, arrears and repossessions are potentially far reaching and long-lasting. As well as the prospect of eviction for households subject to repossession orders, households in arrears face growing debt-service costs in the short-term and suffer worsened credit ratings which induce supply constraints from lenders, making the return to home-ownership and access to all types of credit instrument more costly in the medium-term. Indeed, home-owning households are more likely to achieve greater financial net worth in the long-term and benefit from greater opportunities for equity withdrawal which improve welfare in retirement (Sinai and Souleles (2007). Long-term home ownership has been shown to result in a range

of socio-economic benefits to the household, including increased physical and mental wellbeing (Rossi and Weber, 1996) improved outcomes for children in the home-owning family unit (Green and White, 1997) and residence in neighbourhoods with greater social capital (Di Pasquale and Glasear, 1999). Hence mortgage repayment difficulties raise the prospect of serious decrements to long-term household welfare and heightened current financial stress.

Mortgage arrears and repossessions can also present sizeable financial losses to lenders. During periods of real house price increases, the financial losses of household non-repayment and subsequent repossession for the lender can be minimised, or even result in net gains to the lender. However, the majority of repossessions occur in periods of house price falls, which further encourage repossessions (Foote, 2008) and so present potentially sizeable losses to lenders and investors as the value of repossessed collateral diminishes and housing market supply is extended by repossession sales in an already falling market. Large losses experienced by lenders in the U.S. sub-prime mortgage market in mid-2006 have been widely cited by the news media and academic literature as the predominant cause of the banking crisis of 2008 and subsequent global economic downturn and localised recessions which have followed (Jaffee,) Much of the growth in the U.S. housing market and the majority of foreclosures on U.S. mortgage loans can be attributed to the rise and fall of the sub-prime mortgage market in areas of the U.S. (Mian and Sufi, 2008).

Despite the U.K. housing market having received less attention than the U.S. housing market in media coverage of the current recessions in both markets, concurrent with the rapid decline in the U.S. housing market and increase in foreclosure rates since early 2005, the U.K. has witnessed increasing rate of repossession orders and reported repayment difficulties on mortgage loans. Figure 1 illustrates the U.K. aggregate time series for repossession orders and substantial arrears (6-12 months) over the past 20 years. Figures for repossession orders

are provided by the Ministry of Justice and represent orders brought against home owners approved by magistrates in England and Wales only. Figures for mortgage arrears are provided by the Council of Mortgage Lenders and refer to 1st charge mortgages originated in the U.K. only. As the figure illustrates, repossession orders rose sharply in the early 1990s during the period of recession and housing market collapse in the U.K., trebling in number between 1989 and 1991 alongside a similar magnitude of increase in recorded mortgage arrears. Both measures decline gradually through the 1990s (repossession orders are issued against a property only once, whereas household perpetually exhibiting mortgage arrears will be recorded multiple times in the mortgage arrears series) before repossessions figures turn sharply again in late 2004 near the peak of the U.K. house price boom ahead of the current housing market decline.

The response of U.K. government policy to rising arrears and repossessions by providing direct subsidies to households experiencing difficulties meeting mortgage payments has also mirrored that in the U.S. U.S. policy interventions in the mortgage market under the Housing and Economic Recovery Act 2008 have sought to reduce foreclosure rates by offering new home loans to up to 400,000 U.S. households struggling to meeting the rising debt-service costs associated with reaching interest rate reset points. Under the scheme eligible existing mortgage holders can refinance onto a 30-year fixed rate mortgage at up to 90% of the market value of the home (see White, 2008). In the U.K. government support is available to subsidise mortgage interest payments of unemployment households via Income Support for Mortgage Interest (with approximately 200,000 current claimants) and to allow households who suffer substantial falls in income to defer mortgage payments for up to two years (the Homeowner Mortgage Support Scheme). Both policies offer temporary relief and are based on the presumption that households have experienced temporary shocks to income or creditworthiness.

The paper proceeds as follows. Section 2 summarises the existing empirical literature on household debt repayment difficulties, arrears and distress. Section 3 outlines the basic econometric procedure for modelling financial distress and the instrumental variable approach adopted in this paper towards estimating *ex ante* repayment risk. Section 3 presents results, first for the income 'shocks' which appear to drive repayment difficulties and then for the relationship between repayment difficulties and measures of *ex ante* repayment risk. Section 4 concludes the paper.

2. Existing literature and empirical strategy.

Studies in the existing literature explore the types of events, at the micro and macro level, combined with the institutional factors, which lead to households falling into arrears or reporting difficulties making mortgage repayments. Studies based on aggregate time series data emphasise the relevance of debt-to-income ratios, income gearing, interest rate movements and unemployment to mortgage arrears (Brookes et al, 1994; Figuiera, 2005). Institutional factors appear to play a role in explaining the wide cross-county pattern in mortgage arrears across European nations. Duygan and Grant (2006) calculate from the European Household Community Panel (ECHP) 1995-2001 that the proportion of households in arrears on at least one credit item ranges from less than 1% in Germany to 26% in Greece, arguing that this variation is in part attributable to variation in creditor rights across nations. They also find that shocks to household finances, such as unemployment, are more closely related to failure to repay loans in nations where information sharing is more limited. The scope for recourse available to creditors and extent of information sharing on financial shocks go some way to explaining variation in debt arrears across nations.

While the cross-county pattern in debt and arrears may be explained by institutional differences, and macroeconomic changes impact upon reported household financial distress

at the microeconomic level, recent studies also incorporate the importance of household-specific adverse 'shocks' on debt repayment difficulties. Individual-level data allows the impact of macroeconomic changes across households to be quantified more precisely, such as observing individual unemployment events and the impact of interest rate changes on the debt servicing costs of particular households. The vulnerability of households to events arising at the macroeconomic scale, such as interest rate movements and structural unemployment, is in part determined by the household's debt servicing cost and mortgage position. Adverse macroeconomic events bear more heavily on households with greater debt exposure and less scope for reducing debt service costs, variation which is not captured in aggregate measures of total indebtedness of income gearing. Hence utilising microeconomic data allows for a more accurate evaluation of the impact of both 'macroeconomic' and micro-level shocks on household debt and arrears.

Two recent studies for the U.K. examine the causes of household debt and arrears utilising household surveys which include questions on repayment difficulties, value and time in arrears on debt obligations and self-reported measures of financial distress – questions typically not asked in large-scale U.S. household surveys. Firstly, Bridges and Disney (2005) examine repayment difficulties on a range of secured and unsecured credit instruments among a two-wave panel of low-income households in the U.K. They find a range of socio-economic characteristics are associated with cross-sectional variation in repayment difficulties and arrears, such as renter/tenant housing tenure, age, labour market status, household size, education and health. Similar findings are presented in a number of studies utilising cross-sectional data by Burrows (refs in Boheim here). Also, utilising the short-panel, the authors note a low observed year-on-year persistence in self-reported arrears, with only 30% of households who reported debt problems in the first wave also reporting debt problems in the second wave. Despite the low persistence of arrears and repayment difficulties,

elsewhere the authors find that where arrears appear persistent, they are more commonly related to persistent self-reported psychological distress (Bridges and Disney, 2006), a finding supported by Brown et al (2005).

Secondly, and as a background to this study, Boheim and Taylor (2000) examine housing payment difficulties and evictions among mortgage-holding homeowners, private tenants and social tenants utilising the panel component of the BHPS between 1991 and 1997. Their results corroborate with the findings from cross-section studies that a number of underlying factors are significantly related to the likelihood of a household reporting arrears on housing payments and, ultimately, on the likelihood of eviction. They also show that unexpected changes in financial circumstance increase the likelihood of self-reported repayment difficulties. In each wave, the BHPS questions respondents on how they expect their financial situation to evolve over the coming year – whether it will improve, worsen or stay about the same. A similar question is asked in retrospect about the financial experience of the household over the previous year. Using these questions in combination, their analysis shows that, conditional on household characteristics including income, employment status and household size, a worse-than-expected financial experience over the previous year increases the likelihood of self-reported repayment difficulties. However, the authors do not explore the types of 'shocks' which might cause these changes or the predictability of such events. These topics are the focus of this paper.

Understanding the types of events which might constitute such unanticipated financial disappointments which bear on the household's ability to meet mortgage payments, and to what extent they can indeed be interpreted as 'shocks' is the objective of this study. A variety of factors which decrement household income or increase household debt service costs can potentially in isolation, or combination, cause repayment difficulties. Most obviously, reductions in household income caused by a period of unemployment, or reduced capacity for

work arising from ill-health increase the debt burden upon a household. Alternatively, the breakdown of the household unit through divorce or relationship breakdown may increase the debt burden on a particular member of the household, most likely the member in who is a liable for mortgage repayments. Changes in household expenditure needs arising from, for example, the addition of children to the household might also cause repayment difficulties. Increases in mortgage payments due to rising mortgage interest rates of the failure on the part of the household to refinance their existing mortgage at the interest rate reset point may also cause repayment difficulties. It is relatively straightforward to observe such changes in household circumstances which we might think cause repayment difficulties in household panel data.

A more complex issue is whether such changes can be considered 'shocks', specifically, whether such changes were unpredictable at the point at which the mortgage contract was agreed. As described in the next section, the majority of reported mortgage payment difficulties on the part of households occur within the first few years of a contract, and increase in likelihood with the most of the recorded adverse events described above. At any point in time, including the time of taking out a mortgage, households vary in the likelihood of experiencing an adverse shock, such as unemployment or relationship breakdown. However, a household's 'repayment risk' evaluated at the time of origination, either as income risk or the risk of an adverse event, is normally unobserved. Lending decisions are based on observed credit ratings, which are a backward-looking measure of prior loan performance. Forward-looking measures of income risk are typically not employed due to lack of information. Indeed, even in-depth household surveys typically do not question respondents in detail about the likelihood of unemployment, marital dissolution or ill-health, (the BHPS does include a question on unemployment expectations but this is only asked in

waves six and seven). Hence we cannot directly observe even a self-reported measure of repayment risk.

The search for appropriate instruments for 'repayment risk' in its many potential forms thus poses the challenge of finding observable characteristics associated with an underlying risk of income loss, job loss, relationship breakdown and so on. Here is it possible to borrow an approach taken in the literature which seeks to evaluate income risk for the purposes of estimating levels of precautionary wealth. Studies on precautionary saving have typically used the variability of household income (Carroll and Samwick, 1998), variability of expenditures, (Dynan, 1993) or, in one case, a direct question on unemployment risk (Benito, 2005). A further approach adopted by Carroll (1999), utilised here, is to instrument uncertainty in income using variables such as occupation, industry of employment and region of residence. Such variables most likely impact upon unemployment risk, and the relationship between these characteristics and unemployment can be estimated using a sample including households who experience an unemployment event. Based on an estimated empirical model, unemployment risk can be imputed for households who have not experienced such an event based on the observed characteristics.

Of course, proper econometric identification requires that an instrument for income uncertainty can be found which is related to the outcome of interest (in the case of the precautionary savings literature, savings of wealth; in this case, mortgage repayment difficulty) solely through the instrument's correlation with uncertainty. Such an instrument can then be legitimately omitted from a second-stage regression (Carroll, 1999). The approach of this study, therefore, is to use variables correlated with income uncertainty, marital breakdown uncertainty and ill-health uncertainty which are observable for all households prior to the mortgage contract being originated and on which basis measures of e*x ante* repayment risk can be imputed using an empirical model estimated on the sample

including households which experience unemployment, relationship breakdown and ill-health. A variety of instruments are utilised and overidentification is tested for.

It could be argued that mortgage lending and borrowing decisions are endogenous to household repayment risk in these various forms. If lenders can evaluate the repayment risk of their potential customers, we might expect that riskier borrowers will be denied credit or limited in their borrowing. Hence we might think that households with higher repayment risk will either be more cautious in their mortgage borrowing or less likely to obtain mortgage finance from a lender. Indeed, if *ex ante* repayment risk were perfectly observed by lenders we might expect that mortgage lending decisions optimally price such risk and no *ex post* correlation with non-repayment would exist. Therefore part of the interest of this study is to estimate whether, for households who have been granted mortgage contracts, such *ex ante* measures, conditional on contracting, do predict subsequent repayment problems. The extent to which they do can be considered an indication of whether observed adverse 'shocks' to households occurring after purchase are best considered as shocks or rather reflect imperfect functioning of the mortgage lending process.

3. Data Description and Summary Statistics

This section describes and summarises the UK household data set used in the analysis. The British Household Panel Survey (BHPS) used here is an annual panel survey of approximately 10,000 adults in around 5,000 households that has been running since 1991. Aside from standard questions concerning household demographics, health and economic status, the BHPS in every wave collects information on secured debt, on housing status and self-assessed house value. The survey obtains detailed information on mortgaging and remortgaging, as well as year-on-year self-reported house values. The mortgage data contains data on type of mortgage, original mortgage value, the regular value of mortgage

payments, and the current estimated value of the mortgage. In addition, the BHPS asks respondents in each wave about difficulties meeting mortgage repayments. An initial non-specific question is asked about problems paying for housing: *'Many people these days are finding it difficult to keep up with their housing payments. In the last twelve months would you say you have had any difficulties paying for your accommodation?'* If respondents say yes to this question, they are then asked whether in order to meet housing payments they had to i) borrow or ii) make cutbacks and whether over the course of the previous year they had at any point been at least two months behind with a rental or mortgage payments. Figure 1 plots the proportion of BHPS mortgage-holding households who responded positively to the initial non-specific question on problems paying for housing between 1991 (the first year of the BHPS) and 2007. This statistic closely follows the aggregate series for the proportion of households with mortgages 6-12 months outstanding obtained from Council of Mortgage Lenders (CML) data.

The interest of this study is limited to mortgage-holding households only; hence renters are omitted from the sample from the outset. Among mortgage holders, the majority of reported instances of payment problems for households in the BHPS occur within the first few years after purchase. 70% of positive responses to the housing payment problem question are from households in their first five years of a mortgage contract, and 90% from households within the first 8 years. Given that the majority of problems occur in the early years of a contract, and that the focus of the study is on the relationship between *ex ante* repayment risk and subsequent repayment difficulties, the sample is limited to a panel of mortgage-financed house purchases observed over a seven year period, from the year before purchase, the year of purchase and five subsequent years. This sample captures 83% of the total observations of problems paying for housing among mortgage holding homeowners in the BHPS.

Taking this selection criteria, and removing households for which covariates used in the analysis are not observed, the sample is reduced to a balanced panel of 1,411 households observed for seven years, ranging between 1991-1997 and 2000-2006 (2006 is the most recent wave of the BHPs available at the time of writing). The composition of the sample is described in Table 1. Although the BHPS is a panel survey, the sample is refreshed each wave such that any individual wave can be analysed as a representative cross-section of the British population. Hence the mean age of the household head among home purchasing households does not rise over the period. Between 20 and 30 percent of the sample are first-time buyers in each wave. The order of events in which households are observed prior to house purchase, purchase occurs and subsequent observations of the household are recorded is illustrated in Figure 2. Initial characteristics, 'characteristics before purchase' are observed for purchasers in the wave prior to the year of purchase, time t-1. Over the course of the following year purchase occurs, and at time t=0 purchase details, such as house value and mortgage value at observed. The next five observations t=1, t=2 etc. are post-purchase.

Table 2 describes the average rates of self-reported repayment difficulties by number of years since purchase for households present in the sample. Two patterns in the data are of note. Firstly, more households report problems paying for housing than report actual mortgage arrears, as might be expected. Fewer than one percent of households report that they are 2+ months late with mortgage payments, compared with more than 4 percent of households reporting problems paying for housing over the first four years since purchase. There is a likely ordering of severity of repayment difficulties. Secondly, by all of the measures of payment difficulty, observed difficulties peak within the first three years. The rate of reported problems paying for housing is approximately 40 percent lower in the fifth year after purchase compared to the first year after purchase. As the footnote to this table

describes, this pattern is not apparently due to a high rate of attrition from the sample among households reporting repayment difficulties.

Table 3 also confirms that the distribution of reported payment problems is not centred upon observations of years of purchase during the housing market slump of the early 1990s. Comparing 1991 purchasers to 2001 purchasers, the rate of self-reported payment difficulties is approximately one third greater in the earlier period. Finally, Table 4 describes the frequency of households reporting problems paying for housing. Notably, the majority of households who report a repayment difficulty do so only once, and nearly 80% of those reporting problems do so once or twice. Very few households persistently report payment problems, with only one household reporting repayment problems in all six years post-purchase.

4. Results

This section analyses the relationship between household type, mortgage characteristics, income shocks and subsequent self-reported payment difficulties. As described in the previous section, the BHPS includes a rich set of questions on labour market status, household demographic and educational characteristics and financial data. Table 5 compares households reporting payment problems with those not reporting payment problems for a variety of characteristics. From the p-values of the difference in means, households reporting payment difficulties differ significantly from those not reporting payment difficulties in terms of their age (being typically younger), marital status (less likely married, more likely divorced) and the number of dependent children in the household. As might be expected, households reporting payment problems exhibit a higher mortgage cost as a proportion of monthly income and lower levels of monthly income. Households reporting

mortgage repayment problems are exhibit higher rate of reporting problems paying consumer credit as a burden.

Turning to changes in financial circumstance since purchase, households reporting payment problems show statistically significantly greater rates of reporting a negative financial shock in the same wave, and lower rates of reporting a positive financial shock in the same wave, as documented by Boheim and Taylor (2000). This in itself is not surprising. The final section of the table includes variables which capture adverse events affecting the mortgage holder's ability to meet payment, which one might think represent that financial shocks captured by the previous question. A series of 1/0 dummy variables are created which takes a value of 1 if i) the head of household has experienced a spell of unemployment (at least one month) since purchase ii) the head of household has divorced or separated from his/her partner or spouse since purchase iii) new dependent children have been added to the household since purchase iv) the head of household has become long-term sick, or experienced a period of long-term sickness since purchase and finally v) the head of household has reported that consumer credit payments have become a burden in at least one wave since purchase. Households reporting payment problems exhibit significantly higher rates of each of these 'adverse events', except new dependent children.

The short-panel dataset (6 waves of observations, including the 'at purchase' wave), together with the possibility that households move into and out of reporting repayment problems means a hazard structure is unsuitable for understanding the relationship between household characteristics/changes and payment problems. An alternative option is to exploit the within-household variation in the panel, using household fixed effects. However, a fixed effects model would imply a simultaneous timing of events from a change in household circumstances to the reporting of repayment problems. It is more likely that changes in circumstances might lead to financial distress with a time lag, or even after the change in

circumstance has reversed. For example, a period of unemployment might result in households eroding precautionary wealth over a period of time and entering arrears / repayment problems with a time lag, or plausibly having found new but insufficiently-paying employment. Hence a fixed-effects estimator places to strict a structure on the feed-through of 'events' to repayment problems.

Consequently, the approach taken here is to estimate a random effects probit model, pooling household-observations over the 6 year period. Results are presented in Table 6. Column 1 includes only household and mortgage characteristics at the time of purchase. Households with a self-employed head, more dependent children and lower incomes are more likely to report subsequent repayment problems. Higher Loan-to-income (LTI) and Loan-to-value (LTV) purchases also raise the likelihood of problems, as do first-time purchases. Notably, council house sales (right-to-buy purchases, which commonly involve a discount price compared to open market value of the property) are less likely to result in repayment problems.

Columns 2 and 3 include 'shocks' to household circumstances. Column 2 includes the change in household income, which is the simple difference between current income and income at purchase. Falling household income increases the likelihood of repayment problems. Column 3 omits this measure of change in income and instead includes changes in circumstance which one might expect yield falling income. Unemployment, divorce/separation and the development of long-term sickness since purchase are all significant in the estimates and increase the likelihood of repayment problems. By way of quantifying these effects, the baseline predicted probability of repayment difficulty from the regression is 0.021. Hence a household head experiencing unemployment approximately doubles the likelihood of the household reporting repayment problems. The effect of becoming long-term sick is approximately being half as strong again (the stronger effect

possibly attributable to long-term sickness indicating a permanent reduction in income compared to the temporary impact on income of unemployment). The effect of marital divorce or separation dwarfs both unemployment and long-term sickness, increasing the likelihood of repayment problems by a factor of seven. The positive and significant coefficient on a 1/0 dummy variable for whether the household has reported difficulties repaying consumer credit since purchase further indicates the correlation between problems meeting mortgage payments and difficulties meeting consumer credit commitments.

These results indicate that unemployment, long-term sickness and divorce / relationship breakdown significantly raise the likelihood of a household reporting repayment difficulties, conditional on both characteristics of the loan and initial characteristics of the household. As discussed earlier, such events might constitute either a unpredictable 'shock' to the household or an *ex ante* predictable event. To estimate the impact of *ex ante* unemployment risk, ill-health risk and divorce / separation risk on subsequent repayment problems, the instrumental variables procedure described in Section 2 is implemented using additional information about household characteristics prior to purchase. The IV strategy is to construct a proxy measure of each form of 'risk' based on the relationship between a set of instruments and observed unemployment, ill-health and separation among households in the sample. Instruments are chosen as follows: for unemployment, industry of work (SOC classification), region of residence and years in current job; for separation, whether the cohabiting couple are married, the age of the youngest child in the family unit and number of years since the relationship began; for long-term sickness, the number of existing health conditions reported by the head of household and the number of time the head of household visited his/her GP over the course of the previous year.

The IV strategy is implemented as follows: pooling all observations of BHPS households present in at least two consecutive waves of the BHPS in the period 1992-2001

random effects probit models are estimated for whether the household becomes unemployed, long-term sick or separated in year *t* based on characteristics plus the sets of instruments observed in year *t-1*. From the coefficient estimates, the predicted probability of each event occurring is calculated for each BHPS household present in the panel of homeowners based on characteristics in the year before purchase. As all the information contained in the proxy measures of 'risk' is observed pre-purchase, it is referred to as an *ex ante* measure of repayment risk. These predicted probabilities are then used in the second-stage regression for whether the household reports problems paying for housing over the course of the next 6 years (the same regression as in Table 6 but with the proxy measures of risk now replacing observed events for the household). The proxy measure of 'risk' is the predicted likelihood of the event occurring in the next year. Table 7 reports F-statistics for the instruments used in the first-stage regressions. All instruments are statistically significant at the 5% level (some instruments might be considered 'weak' – region of residence for unemployment and number of times visited GP for ill-health). Figure 3 illustrates the distribution of the proxy measures of risk across households.

Results from the second-stage regressions are reported in Table 8. The second-stage regressions retain a common set of covariates from table Table 7, but in this specification the variables relating to unemployment, long-term sickness and separation are the risk proxies evaluated at the year before purchase. Hence all the information in the regressions in Table 8 is pre-purchase. The model in Column 1 is estimated over all households and includes the proxy measures of unemployment risk and long-term sick risk. Column 2 includes the measure of 'separation risk' and is estimated over married/cohabiting couples only (as non-cohabiting household heads exhibit zero risk of separation. None of the recorded house purchases are undertaken by unemployed household heads or long-term sick household heads, so this selection is not necessary for households in Column 1).

In Column 1 both the unemployment risk and long-term sick risk proxies are positively signed and statistically significant at the 1% level. To quantify the marginal effect on unemployment risk of 0.510, the baseline predicted probability from the regression is 0.0257, mean unemployment risk 0.0103 and the standard deviation of unemployment risk 0.01. Hence a one standard deviation increase in unemployment risk increases the likelihood of reporting problems paying for housing by 25%. The same calculation for the proxy measure of risk of long-term sickness (mean 0.021, standard deviation 0.014) implies a one standard deviation increase raises the likelihood of reporting problems paying for housing by 13%. In Column 2 the coefficients on unemployment risk and long-term stick risk are little changed. The marginal effect on separation risk in this regression implies a one standard deviation increase raises the likelihood of repayment problems by 20% (mean 0.107, standard deviation 0.0070. The simulated impact of higher risk characteristics among households at the time of purchase therefore implies a non-negligible increase in the likelihood of reporting subsequent repayment difficulties.

What are the implications of these results for understanding household financial distress and the efficacy of mortgage lending decisions? The non-negligible predictive power of the *ex ante* repayment risk measures could be taken as indicative of inefficiencies within the mortgage lending/borrowing decision. If optimal lending pricing and allocation of credit implies no relationship between characteristics at purchase and subsequent repayment difficulties, the predictive power of the risk measures suggests imperfections in the lending process. It might also suggest sub-optimal borrowing decisions on the part of some borrowers, who, for given characteristics of a loan (LTI, LTV etc controlled for in the analysis) face greater likelihood of repayment difficulties due to their underlying risk of experiencing an 'income shock' of the type stylised in the regressions.

5. Conclusion

The U.K. economic experience in the period covered by this analysis, 1992 to 2001, was characterised by a housing market 'bust' and economic downturn followed by an upturn in the economy and beginnings of a robust and sustained house price boom, which has now once more turned to bust. Prevailing macroeconomic conditions evidently go some way to explaining the greater prevalence of financial distress and arrears in the earlier part of the period. However, the analysis highlights that throughout this period house-purchasing households are observed to report repayment problems, typically in the first few years following purchase. However, occurrences of financial distress appear non-persistent, with only a small proportion of households who report financial distress doing so perpetually over the 6 year period of observation.

The analysis indicates that problems meeting housing payments are related to both the extent of household borrowing and level and 'riskiness' of household income and commitments. Measures of leverage and gearing of household mortgage borrowing are positively correlated with repayment problems, as is a lack of experience in mortgage markets and lower income. However, the changes in household status pertaining to income and financial commitments are shown not just to be significantly related to payment problems, but to a non-negligible extent predictable on the basis of household characteristics prior to purchase. This raises questions about the efficiency of the mortgage lending process.

One possibility forwarded here is that the information on household characteristics and histories available in the BHPS is much richer than the information typically obtained by lenders either by mortgage applications or via credit score data. The risk proxies used in the analysis were estimated using instrumental variables typically not known to the lender: details of labour market status and profession, health status and details of marital and

relationship status. All of the risk proxies are based on non-financial information of a type which lenders might not be able to readily obtain from borrowers. The implication of the analysis is that such information about the applicant – the security of their job, robustness of their health and stability of their relationships – might, perhaps unsurprisingly, have a significant role to play in lending decisions.

REFERENCES

Banks, J., R. Blundell and J. Smith (2003) 'Wealth Portfolios in the US and the UK' in D. Wise (ed.) Perspectives in the Economics of Ageing, Chicago University Press, Chicago.

Bajari, P., S. Chu and M. Park (2008) 'An Empirical Model of Subprime Mortgage Default from 2000-2007'. NBER Working Paper No.14625, Cambridge, M.A.

Benito, A. (2006) 'Does Job Insecurity Affect Household Consumption?' *Oxford Economic Papers*, 58: 157-181.

Boheim, R. And M. Taylor (2000) 'My Home Was My Castle: Evictions and Repossessions in Britain'. *Journal of Housing Economics* 9:287-319.

Bridges, S. And R. Disney (2006) 'Debt and Depression.' Centre for Finance and Credit Markets Working Paper 06/02, School of Economics, University of Nottingham, England.

Bridges, S. And R. Disney (2004) 'Use of Credit and Arrears on Debt Among Low Income Families in the United Kindom'. *Fiscal Studies* 25:1-25.

Brookes, M., M. Dicks and M. Pradham (1994) 'An Empirical Model of Mortgage Arrears and Repossessions'. *Economic Modelling*, 11:134-144.

Calormis, C., S. Longhofer and W. Miles (2008) 'The Foreclosure-House Price Nexus: Lessons from the 2007-8 Housing Turmoil'. NBER Working Paper 14294, Cambridge, M.A.

Carroll, C., and A. Samwick (1998) 'How Important Is Precautionary Saving?'. *Review of Economics and Statistics*, 80:410-419.

Carroll, C., and A. Samwick (1997) 'The Nature of Precautionary Wealth'. *Journal of Monetary Economics*, 40:41-71.

Deng, Y., J. Quigley and R. Van Order (2000) 'Mortgage Terminations, Heterogeneity and the Exercise of Mortgage Options'. *Econometrica*, 68:275-308.

Di Pasquale, D., and E. Glasear (1999) 'Incentives and Social Capital: Are Homeowners Better Citizens?' *Journal of Urban Economics*, 45:354-384

Duygan-Bump, B. And C. Grant (2009) 'Household Debt Repayment Behaviour: What Role do Institutions Play?' *Economic Policy* 24:107-140.

Dynan, K. (1993) 'How Prudent Are Consumers?' *Journal of Political Economy*, 101: 1104-13.

Figuiera, C., J. Glen and J. Nellis (2005) 'A Dynamic Analysis of Mortgage Arrears in the UK Housing Market.' *Urban Studies* 41:1755-1769.

Foote, C., K. Geradi and P. Willen (2008) 'Negative Equity and Foreclosure: Theory and Evidence'. *Journal of Urban Economics* 64:234-245.

Green, R. And M. White (1997) 'Measuring the Benefits of Homeownership: Effects on Children'. *Journal of Urban Economics*, 41:441-461.

May, O., M. Tudela and G. Young (2005) 'British Household Indebtedness and Financial Stress: A Household-Level Picture'. Bank of England Quarterly Bulletin, Winter 2004. Bank of England, London, England.

Mian, A., and A. Sufi (2008) 'The Consequences of Mortgage Credit Expansion: Evidence from the 2007 Mortgage Default Crisis'. NBER Working Paper No. 13936, Cambridge, M.A.

Rossi, P. and E. Weber (1996) 'The Social Benefits of Homeownership: Empirical Evidence from National Surveys'. *Housing Policy Debate*, 7:1-35.

Sinai, T. and N. Souleles (2007) 'Net Worth and Housing Equity in Retirement'. NBER Working Paper No. 13693, Cambridge, M.A.

White, M. (2008) 'Bankruptcy: Past Puzzles, Recent Reforms, and the Mortgage Crisis'. NBER Working Paper No. 14549, Cambridge, M.A.

Figure 1
Mortgages Repayment Difficulties, Arrears And Repossesion Orders, U.K. Housing Market and BHPS Sample.

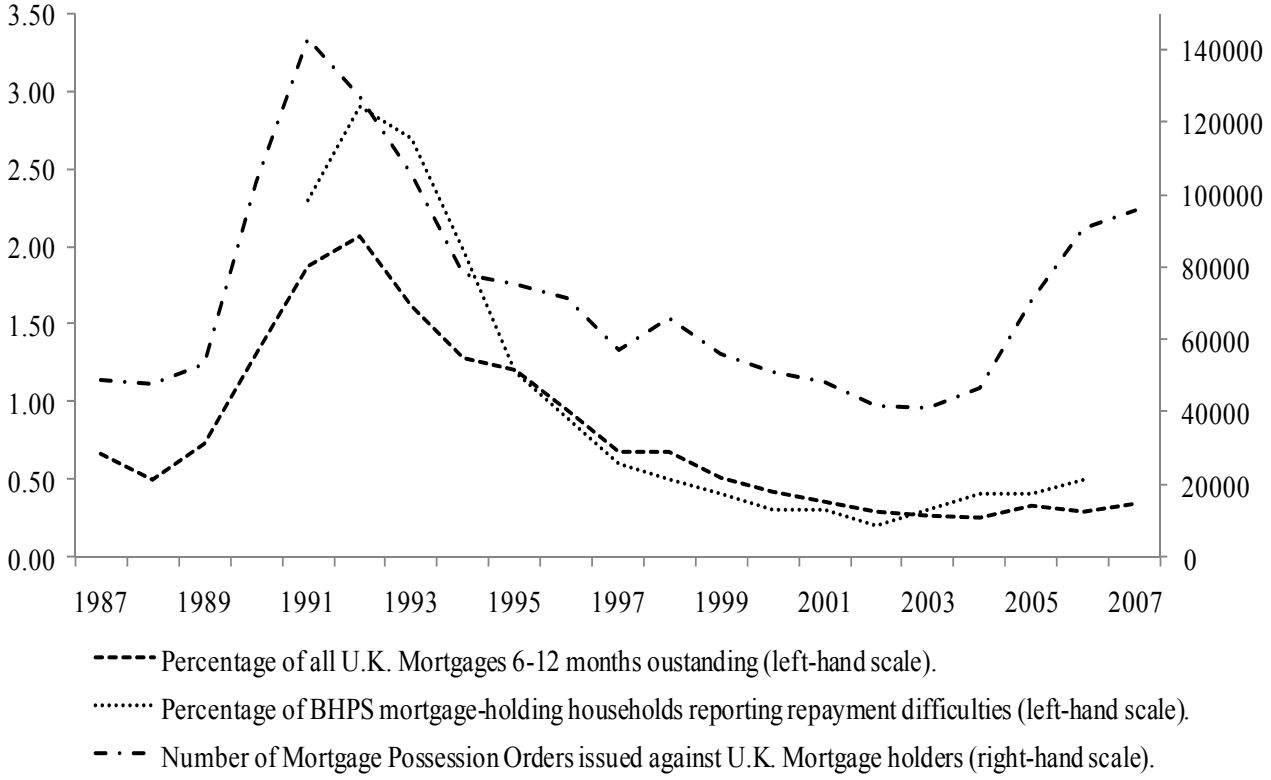

Figure 2
Timing and Observation of Events in BHPS Sample

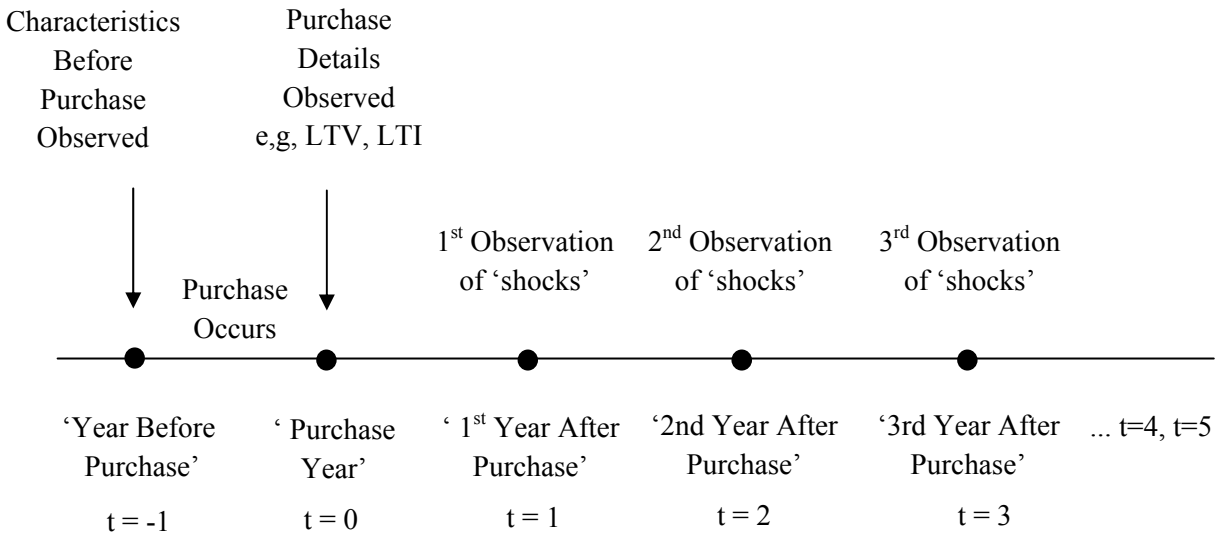

Table 1 New Home Buyers, 1992-2001 by Frequency and Age			
Year of Purchase	Number of Home Buyers	First-Time Buyers (%)	Mean Age of Household Head
1992	145	7.5	45.2
1993	105	12.1	42.7
1994	135	30.3	40.1
1995	148	20.2	44.0
1996	134	27.6	43.7
1997	133	24.1	40.2
1998	172	24.4	41.5
1999	142	32.3	42.2
2000	153	35.9	43.6
2001	141	34.7	43.8

Table 2 Financial Distress and Repayment Difficulties Among House Buyers 1,411 Home-Buying Households Who Remained In Survey for 5 Years After Purchase Year, BHPS 1992-2001					
Years After House Purchase	Problems Paying For Housing (%)	Paying For Housing Required Cutbacks (%)	Paying For Housing Required Borrowing (%)	2+ Months Late With Mortgage Payment (%)	Left Homeownership In This Year Having Reported Problems Paying Last Year (%)
0	0.049	0.039	0.009	0.004	-
1	0.052	0.038	0.009	0.006	0.003
2	0.050	0.031	0.005	0.008	0.003
3	0.045	0.021	0.005	0.005	0.002
4	0.040	0.017	0.005	0.004	0.002
5	0.031	0.009	0.002	0.0004	0.001

Sample composed households who remained in survey for 5 years only. Five-year attrition rate among households never reporting a repayment problem is 30%. Five-year attrition rate among households who report a repayment problem in at least one wave following house purchase is 18%.

Table 3 Problems Paying for Housing, 1991 Purchasers Compared To 2001 Purchasers		
Years After House Purchase	Home Buyers in 1991 Problems Paying for Housing (%)	Home Buyers in 2001 Problems Paying for Housing (%)
0	0.055	0.042
1	0.041	0.035
2	0.048	0.028
3	0.048	0.031
4	0.042	0.025
5	0.031	0.020
N	145	141

Table 4 Frequency of Reporting Problems Paying for Housing, Whole Sample	
Number of Years Report Problem	1,411 Home Buyers over 6-year period (includes year of purchase)
0	1183
1	158
2	35
3	18
4	9
5	7
6	1
At least 1	263

Table 5
Summary Statistics for Household-Observations Reporting Repayment Difficulties Compared to Sample

	Reporting Problems Paying For Housing	Not Reporting Problems Paying For Housing	P-Value of Difference
Demographics & Education			
Age	38.9	44.2	0.0000
Male head	0.54	0.49	0.1026
Married	0.79	0.87	0.0001
Divorced	0.11	0.05	0.0000
Ethnic Minority	0.02	0.02	0.7559
A-level	0.15	0.17	0.3916
Degree	0.13	0.15	0.3301
Employed	0.63	0.67	0.2313
Unemployed	0.03	0.01	0.0057
Number of Dependent Children	1.13	0.74	0.0000
Long-Term Sick	0.02	0.01	0.0182
No. Health Problems	1.03	0.94	0.2662
Income and Household Finances			
Gross Household Monthly Income	2011	2507	0.0000
Mortgage Cost as % Income	0.59	0.30	0.0000
Consumer Credit Payments a Burden	0.82	0.32	0.0000
Negative Financial Shock, This Year	0.29	0.19	0.0000
Positive Financial Shock, This Year	0.54	0.71	0.0000
Changes in Household & Employment			
Became unemployed since purchase	0.03	0.01	0.0001
Divorced / Separated since purchase	0.06	0.01	0.0000
New dependent children since purchase	0.03	0.02	0.1365
Became long-term sick since purchase	0.01	0.00	0.0004
Consumer credit problems, since purchase	0.28	0.20	0.1519
N	263	6403	

Note: 1,411 households observed over 5 years following house purchase.

Table 6
Probit Estimates for Household Mortgage Repayment Difficulties
Characteristics at Purchase and Subsequent 'Shocks'.

Dependent Variable: 'Problems Paying For Housing' Estimator: Random Effects Probit.	(1) Characteristics at Purchase		(2) Characteristics at Purchase Plus Income 'Shock'		(3) Characteristics at Purchase Plus Other 'Shocks'	
Characteristics Year Before Purchase:						
Age Household Head	-0.003 (0.002)	*-0.0002*	-0.004 (0.002)	*-0.0002*	-0.004 (0.003)	*-0.0002*
Male Household Head	0.09 (0.06)	*0.006*	0.09 (0.07)	*0.005*	0.07 (0.07)	*0.004*
Married/Cohabiting	0.08 (0.08)	*0.005*	0.03 (0.08)	*0.002*	0.09 (0.09)	*0.005*
Head Self-Employed	0.36** (0.12)	*0.03*	0.39** (0.12)	*0.03*	0.39** (0.12)	*0.03*
Spouse Employed	-0.09 (0.06)	*-0.006*	-0.09 (0.07)	*-0.006*	-0.12 (0.07)	*-0.06*
No. of Dependent Children	0.10** (0.03)	*0.006*	0.10** (0.03)	*0.006*	0.09** (0.03)	*0.005*
Household Income (£s)	-0.01** (0.002)	*-0.0008*	-0.01** (0.002)	*-0.001*	-0.01** (0.002)	*-0.0006*
Characteristics of Purchase:						
Council House Sale	-0.27** (0.11)	*-0.01*	-0.28** (0.11)	*-0.01*	-0.23** (0.11)	*-0.01*
First Time Buyer	0.48** (0.07)	*0.04*	0.47** (0.07)	*0.04*	0.49** (0.07)	*0.04*
Loan-to-Value Ratio {0,1}	0.34** (0.14)	*0.02*	0.36** (0.14)	*0.02*	0.34** (0.14)	*0.02*
Loan-to-Income Ratio	0.08* (0.04)	*0.004*	0.07* (0.04)	*0.004*	0.07* (0.04)	*0.004*
'Changes' Between Purchase Year and Current Year						
Change in Household Income	-	-	-0.07** (0.02)	*-0.004*	-	-
Unemployment	-	-	-	-	0.29** (0.10)	*0.02*
Divorce/Separation	-	-	-	-	1.02** (0.18)	*0.14*
Long-Term Sick	-	-	-	-	0.40** (0.16)	*0.03*
New Dependent Children	-	-	-	-	0.004 (0.06)	*0.0001*
Began Reporting Difficulties Repaying Consumer Credit	-	-	-	-	0.62** (0.09)	*0.06*
No. Observations	7055		7055		7055	
Pseudo R^2	0.10		0.13		0.14	
LR X^2	233.32		240.11		317.14	
Prob> χ^2	0.0000		0.0000		0.0000	
Log Likelihood	-991.26		987.87		-948.10	

Notes to Table 6: Coefficients, (Standard Errors), *Marginal Effects*. Denotes significance at **1%, *5% level. 7055 observations of 1,411 households over 5 years following purchase year. Dependent variable is dummy variable for whether the head of household reports problems paying for housing in current year. 'Characteristics

Year Before Purchase' are recorded in wave prior to wave in which purchase is reported. Probit estimates also include a dummy variable for whether the head of household is a member of an ethnic minority, dummy variables for educational qualifications of household head (hnd, o-levels or equivalent, a-levels and degree), dummy variables for labour market status of household head (employed, unemployed) and time dummies for year of purchase.

Table 7
First-Stage Estimation Results For
Unemployment Risk, Separation Risk and Health Risk Proxy Measures
P-Values for F-tests of Probit Coefficient Values = 0

Becoming Unemployed		Becoming Divorced / Separated		Becoming Long-Term Sick	
Industry	0.0000	Married	0.0116	No. Existing Health Conditions	0.0000
Region	0.0300	Age Youngest Child	0.0000	No. Times Visited GP, Previous Year	0.0240
New Job	0.0015	Years in Relationship	0.0000		
Mean Pr(y*)	0.012	Mean Pr(y*)	0.010	Mean Pr(y*)	0.021
Std. Dev. Pr(y*)	0.061	St. Dev. Pr(y*)	0.07	St. Dev. Pr(y*)	0.012
N. Observations	52186		45438		52186

Figure 3
Distributions of Proxy Unemployment Risk, Divorce Risk and Health Risk Measures

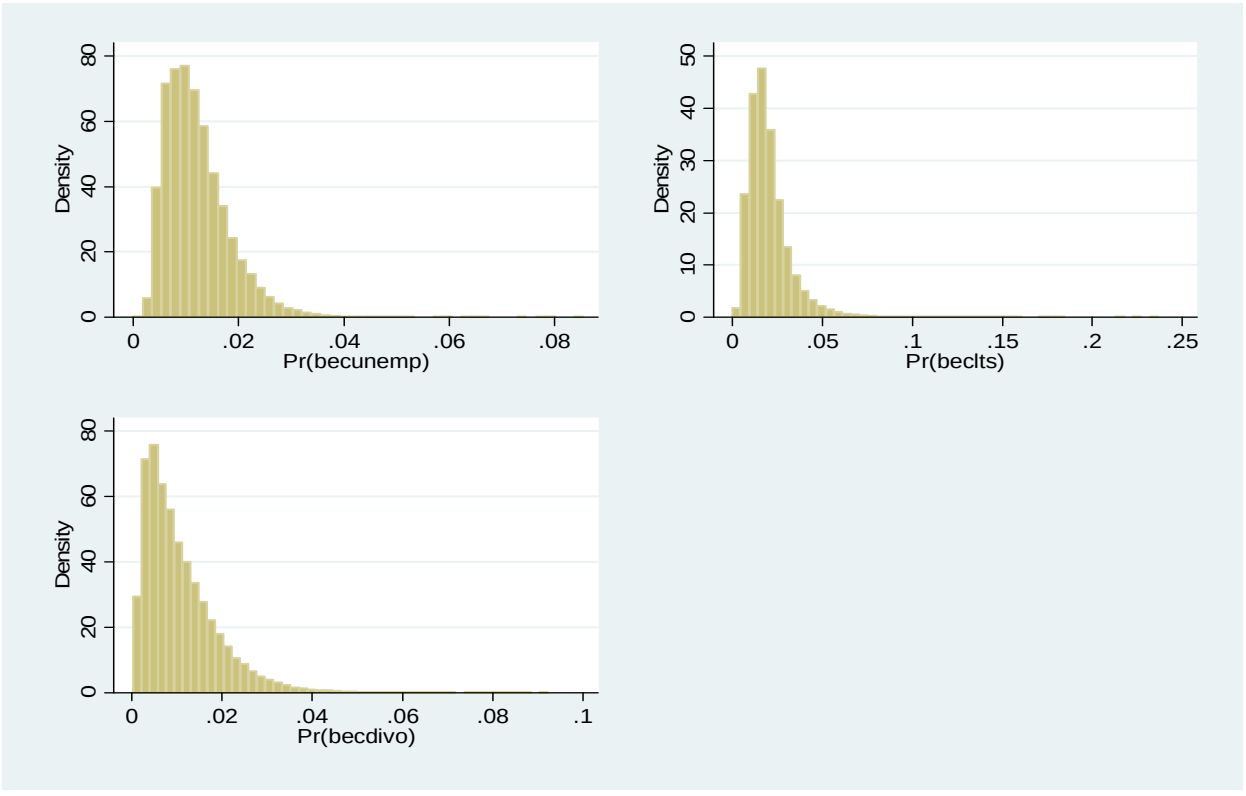

Table 8
Probit Estimates for Household Mortgage Repayment Difficulties Based On Characteristics and Risk Proxy Measures at Year *Before* House Purchase

Dependent Variable: 'Problems Paying For Housing' Estimator: Random Effects Probit (2nd Stage)	(1) Whole Sample		(2) Co-Habiting Heads of Household Only	
Characteristics Year Before Purchase:				
Age Household Head	-0.003 (0.002)	*-0.0002*	-0.004 (0.003)	*-0.0003*
Male Household Head	0.112 (0.07)	*0.007*	0.111 (0.07)	*0.009*
Married/Cohabiting	0.09 (0.08)	*0.006*	0.08 (0.08)	*0.005*
Head Self-Employed	0.23 (0.14)	*0.016*	0.23 (0.14)	*0.016*
Spouse Employed	-0.10 (0.07)	*-0.006*	-0.13 (0.06)	*-0.007*
No. of Dependent Children	0.09** (0.03)	*0.006*	0.12** (0.03)	*0.007*
Household Income (£s)	-0.01** (0.0002)	*-0.0006*	-0.01 (0.002)	*-0.0006*
Characteristics of Purchase:				
Council House Sale	-0.27** (0.11)	*-0.013*	-0.29** (0.11)	*-0.014*
First Time Buyer	0.45** (0.07)	*0.035*	0.47** (0.07)	*0.036*
Loan-to-Value Ratio {0,1}	0.29* (0.14)	*0.017*	0.28** (0.14)	*0.016*
Loan-to-Income Ratio	0.07* (0.04)	*0.004*	0.07* (0.04)	*0.004*
Risk Proxies Estimated at Year Before Purchase				
Unemployment Risk	8.26** (2.71)	0.498	8.28** (2.89)	*0.510*
Long-Term Sick Risk	4.17** (1.58)	0.252	4.31** (1.70)	0.261
Separation Risk	-	-	10.18** (3.28)	0.614
No. Observations	7055		6066	
Pseudo R^2	0.11		0.12	
LR X^2	252.66		255.65	
Prob> χ^2	0.0000		0.0000	
Log Likelihood	-981.59		-980.10	

Working Paper List 2008

Number	Author	Title
08/10	Marta Aloi, Manuel Leite-Monteiro and Teresa Lloyd-Braga	Unionized Labor Markets and Globalized Capital Markets
08/09	Simona Mateut, Spiros Bougheas and Paul Mizen	Corporate trade credit and inventories: New evidence of a tradeoff from accounts payable and receivable
08/08	Christos Koulovatianos, Leonard J. Mirman and Marc Santugini	Optimal Growth and Uncertainty: Learning
08/07	Christos Koulovatianos, Carsten Schröder and Ulrich Schmidt	Nonmarket Household Time and the Cost of Children
08/06	Christiane Baumeister, Eveline Durinck and Gert Peersman	Liquidity, Inflation and Asset Prices in a Time-Varying Framework for the Euro Area
08/05	Sophia Mueller-Spahn	The Pass Through From Market Interest Rates to Retail Bank Rates in Germany
08/04	Maria Garcia-Vega and Alessandra Guariglia	Volatility, Financial Constraints and Trade
08/03	Richard Disney and John Gathergood	Housing Wealth, Liquidity Constraints and Self-Employment
08/02	Paul Mizen and Serafeim Tsoukas	What Effect has Bond Market Development in Asia had on the Issue of Corporate Bonds
08/01	Paul Mizen and Serafeim Tsoukas	Modelling the Persistence of Credit Ratings When Firms Face Financial Constraints, Recessions and Credit Crunches

Working Paper List 2007

Number	Author	Title
07/11	Rob Carpenter and Alessandra Guariglia	Investment Behaviour, Observable Expectations, and Internal Funds: a comments on Cummins et al, AER (2006)
07/10	John Tsoukalas	The Cyclical Dynamics of Investment: The Role of Financing and Irreversibility Constraints
07/09	Spiros Bougheas, Paul Mizen and Cihan Yalcin	An Open Economy Model of the Credit Channel Applied to Four Asian Economies
07/08	Paul Mizen & Kevin Lee	Household Credit and Probability Forecasts of Financial Distress in the United Kingdom
07/07	Tae-Hwan Kim, Paul Mizen & Alan Thanaset	Predicting Directional Changes in Interest Rates: Gains from Using Information from Monetary Indicators
07/06	Tae-Hwan Kim, and Paul Mizen	Estimating Monetary Reaction Functions at Near Zero Interest Rates: An Example Using Japanese Data
07/05	Paul Mizen, Tae-Hwan Kim and Alan Thanaset	Evaluating the Taylor Principle Over the Distribution of the Interest Rate: Evidence from the US, UK & Japan
07/04	Tae-Hwan Kim, Paul Mizen and Alan Thanaset	Forecasting Changes in UK Interest rates
07/03	Alessandra Guariglia	Internal Financial Constraints, External Financial Constraints, and Investment Choice: Evidence From a Panel of UK Firms
07/02	Richard Disney	Household Saving Rates and the Design of Public Pension Programmes: Cross-Country Evidence
07/01	Richard Disney, Carl Emmerson and Matthew Wakefield	Public Provision and Retirement Saving: Lessons from the U.K.

Working Paper List 2006

Number	Author	Title
06/04	Paul Mizen & Serafeim Tsoukas	Evidence on the External Finance Premium from the US and Emerging Asian Corporate Bond Markets
06/03	Woojin Chung, Richard Disney, Carl Emmerson & Matthew Wakefield	Public Policy and Retirement Saving Incentives in the U.K.
06/02	Sarah Bridges & Richard Disney	Debt and Depression
06/01	Sarah Bridges, Richard Disney & John Gathergood	Housing Wealth and Household Indebtedness: Is There a 'Household Financial Accelerator'?

Working Paper List 2005

Number	Author	Title
05/02	Simona Mateut and Alessandra Guariglia	Credit channel, trade credit channel, and inventory investment: evidence from a panel of UK firms
05/01	Simona Mateut, Spiros Bougheas and Paul Mizen	Trade Credit, Bank Lending and Monetary Policy Transmission