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**Debt and Depression: Evidence
on Casual Links and Social
Stigma Effects**

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DEBT AND DEPRESSION: EVIDENCE ON CAUSAL LINKS AND SOCIAL STIGMA EFFECTS

by

John Gathergood*

Abstract

Using individual-level panel data, this paper examines the relationship between problem debt and psychological health. Individuals exhibiting problem debt, by either subjective or objective measures, also exhibit much worse psychological health, by either subjective or objective measures. However, selection into problem debt on the basis of poor psychological health accounts for much of this difference. The causality between problem debt and psychological health may be two-way. Local house price movements exogenous to individual households are used to establish the causality from problem mortgage debt to psychological health. In addition, the social stigmas effects of problem debt are investigated using local bankruptcy and repossession rates as indicators of the local prevalence of problem debt in a reference group population. Results indicate there is a sizeable causal link between problem debt and psychological health and that reference group effects are also significant in magnitude.

Key words: debt, over-indebtedness, depression, reference group effects

JEL classification: I10, D14

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DEBT AND DEPRESSION: EVIDENCE ON CAUSAL LINKS AND SOCIAL STIGMA EFFECTS

1. Introduction

This paper examines the relationship between household problem debt, otherwise known as over-indebtedness, and psychological health using the U.K.'s household panel survey. Access credit improves individuals' welfare by facilitating consumption smoothing. However, inability to repay debts can result in drastic welfare losses arising from bankruptcy or the seizure of collateral such as housing. Psychiatrists commonly report problem debt as a source of severe anxiety and psychological distress (Fitch, 2007). In the medical literature small-scale studies based on individuals exhibiting poor mental health find problem debts to be a common correlate with depression, anxiety and even self-harm (Hatcher, 1994; Reading and Reynolds, 2001; Maciejewski et al., 2000). The economics and health literatures document a strong statistical association between problem debt and poor psychological health. Studies based on larger sample of cross-sectional survey data using self-reported health data show the positive association between high levels of debt or usage of high-cost credit and poor psychological health is not readily explained by covariates such as demographic and related characteristics or other existing health conditions (Bartel and Taubman, 1986; Lea et al., 1995; Drentea, 2000; Brown et al., 2005; Hamilton et al., 1997; Lenton and Mosley, 2008).

What is more difficult to establish is causality between problem debt and psychological stress. The positive relationship between the two might be explained by unobserved factors not captured in cross-section analysis. Also, there is the possibility of a two-way causality between debt and depression: the anxiety and worry caused by the onset of problem debt might lead to an individual's psychological health, or alternately an individual's

psychological health might lead them to incur problem debts. Understanding the relationship from self-reported debt to self-reported depression is made more difficult by the possibility that an individual's perception of the severity of their debt problems may be affected by their psychological health state. An individual with poor psychological health might be more, or less, inclined to subjectively report they are struggling with debts compared to an individual with good psychological health in the same financial situation. Establishing the causality between problem debt and depression is further made difficult by the challenge of finding suitable instruments which provide exogenous variation in problem debts which are plausibly unrelated to an individual's psychological health.

A recent study by Bridges and Disney (2010) uses a short-panel of U.K. household survey data (The Family and Children Survey) to model the relationship between debt and psychological health. They find that objective measures of debt problems (such as self-reported values for arrears or late payment on credit) correlate more weakly with subjective evaluations of poor health than subjective measures of debt problems (such as questions which ask individuals about their ability to cope with their financial burdens). Furthermore, they model the simultaneous relationship between debt and psychological health in a bivariate probit model and find the relationship between both objective and subjective measures of problem debt and psychological health weakens further. They conclude that poor psychological health affects an individual's perception of their financial situation and that unobserved heterogeneity in the tendency of individuals to report problems with both their health and their finances explains most of the observed correlation between measures of problem debt and measures of psychological health.

This study investigates the relationship between problem debt and psychological health for the U.K. It uses data from the British Household Panel Survey (BHPS) previously used by Wildman (2002) and Brown et al. (2005) related studies. Although the financial data

contained in the BHPS is inferior to that found in FACS, the key advantage of using the BHPS in this study is that it includes data on the geographical location of the household, not available in FACS. This data is crucial for the instrumental variable strategy used to identify the causal impact of problem debt (which uses local level house price movements), and to establish reference group effects (which are defined at the local level) later in the paper. The BHPS also has the advantage of including the General Health Questionnaire (GHQ) as an alternative to self-reported data on anxiety-related medical conditions, allowing a comparison between subjective and objective measures of poor psychological health. Also, the BHPS has the advantage of being more representative of the population as a whole. Whereas FACS surveys only family units with children and in the vast majority of cases interviews the mother (with women twice as likely to report depression compared with men in the U.K.), the BHPS is a representative sample of all U.K. households and adopts the typical convention of allowing the household to self-assign the household head and interviews all members of the household. Finally, the BHPS is a long-running household panel and so provides a usable number of observations of individuals with very severe debt problems.

This study makes the following contributions. Firstly, it documents the large cross-sectional inequality in psychological health arising from problem debts. This is established for both a subjective health measure (the General Health Questionnaire) and an objective measure (anxiety or depression reported by individuals as a medical condition) together with a subjective problem debt measure (the self-reported burden of debt) and objective problem debt measure (arrears on debt) for mortgage and non-mortgage debts. In a multivariate model estimated on cross-section data with a range of demographic and socio-economic controls individuals who report they face ‘difficulty’ meeting their housing payments (mortgage or rent) are at least two months late on their housing payments, or who report that meeting their

consumer credit repayments presents a 'heavy burden' to their household, exhibit worse GHQ scores and greater propensity to suffer from depression.

Secondly, it shows that selection into problem debt on the basis of poor psychological health accounts for much of the observed cross-sectional variation in psychological health between those with and without problem debts. One limitation of those studies based which find an association between problem debt and psychological distress in cross-sections of individuals is that the cross-sectional correlation might to some degree arise from selection. This is found to be the case: individuals who are observed to move into arrears on their housing payments or into reporting a heavy burden of debts between two waves of data exhibited, on average, worse psychological health than those not moving into debt problems in the first wave of data. This positive selection into problem debt on the basis of poor psychological health accounts for approximately half of the observed difference in health in the cross-section comparison between the two groups.

Thirdly, the study attempts an instrumental variables strategy towards understanding the causal impact of problem debt on psychological health by using variation in local level house prices as exogenous variation in the severity of the consequences of inability to meet mortgage debt commitments. It does so in the following manner: it is shown that mortgage holders who enter into arrears on their mortgage debts in localities where house prices are growing (and so their home equity 'buffer' is increasing) suffer less deterioration in psychological health compared to individuals who enter into arrears in localities where house prices are falling (and so their home equity 'buffer' is decreasing). Home equity buffers have been shown to be important forms of consumption insurance for households facing adverse income shocks (Hurst et al. 2005; Benito, 2009). This instrumental variable strategy allows a natural comparison group – renting households – for whom the impact of rent arrears on psychological health is shown to be unaffected by local house price movements, hence

allowing us to rule out the possibility that local house price movements simply proxy for local economic conditions in these regressions.

Fourthly, the impact of the onset of problem debt on psychological health is shown to demonstrate a ‘reference group’ effect. To this author’s knowledge no study in the literature to date has considered the role for reference group effects in the relationship between problem debt and psychological health; though such effects have been widely studied in the labour supply and consumption literatures (see Lindbeck et. al., 1999; Binder and Pesaran, 1998). Individuals who exhibit the onset of problems repaying their unsecured debts in localities with a higher bankruptcy rate are shown to experience less deterioration in psychological health compared to individuals exhibiting the onset of problem repaying their unsecured debts in localities with lower bankruptcy rates. In the context of a uniform bankruptcy law across localities (and so little reason to believe that non-payment on unsecured debts is more likely to result in a bankruptcy filing in one region compared with another) this result is interpreted as evidence of a reduced stigma associated with problem debt in areas in which problem debt is more prevalent. By contrast, individuals who exhibit the onset of problems repaying their secured debts in localities with higher mortgage repossession rates are shown to experience more deterioration in psychological health compared to individuals exhibiting the onset of problems repaying their secured debts in localities with lower mortgage repossession rates. One interpretation of this result is that variation in repossession rates across localities reflects in part variation in the aggressiveness with which mortgage lenders seek repossession orders in different localities.

2. Data

2.1 The BHPS

This section describes the BHPS data. The BHPS is a long-running household panel survey for the U.K. which started in 1991 and has been conducted annually; the most recent available data is for the year 2008. All 18 available waves of data are used for this study. The BHPS is a general household survey which began with approximately 5,500 households with 10,000 individuals from England and Wales in 1991, interviewing adults in the household on a range of socio-economic topics including their finances, labour market activity and health. The survey was subsequently expanded to include samples of households from Northern Ireland, Scotland and Wales. Since the 1991 survey, annual follow-up surveys have tracked off-shoot households and households who leave the panel have been replaced. Wave 18 of the survey covers approximately 8,000 households and 26,000 individuals.

The BHPS includes detailed information on demographic and socio-economic characteristics relevant for this study, such as respondent age, gender, marital status, number and age of child dependents, ethnic minority status, educational achievements and labour market status. These variables are important control variables for modelling the relationship between problem debt and psychological health in the econometric analysis which follows. Also, the key advantage of using the BHPS for this study is that it contains geographic identifiers (available down to the census statistical area level) not available in the FACS used by Bridges and Disney (2010). This data is crucial for the analysis as it allows the matching of local house price index data and local bankruptcy and repossession rate data also used in the econometric analysis which follows. As the health and debt data are central to this study, these are now considered in more detail.

2.2 Psychological Health Data

The health data contained in the BHPS takes the form of a variety of self-reported 'objective' and 'subjective' health measures. 'Objective' in this contexts refers to survey

questions in which individuals are asked to identify whether they have a particular health problem for which they are receiving treatment as opposed to 'subjective' questions which ask individuals to evaluate their own health state on a likert scale. To some extent all self-reported data is subjective in the sense that individuals might choose to mis-report or conceal data even in scenarios in which objective questions (such as about having a particular health condition) are clear-cut.

In the interviewer-lead health module of the survey all adult respondents in the household are first asked to identify themselves as disabled or not, and then asked a question about their general health status: *'Please think back over the last 12 months about how your health has been. Compared to people of your own age, would you say that your health has on the whole been ... Excellent , Good , Fair, Poor , or Very Poor?, Don't know'*. Following this question respondents are then asked to identify the health problems or disabilities which they currently suffer from among those on a list, the most relevant of which for this analysis is *'Anxiety, depression of bad nerves, psychiatric problems'*. The details of the specific wording of the question and list of choices in full are given in Appendix 1 under Question 1. It is important to note that the interviewer conducting the survey asks respondents to ignore temporary conditions when responding to this question.

Following on from this question, respondents are asked a series of questions on whether their health limits the types of activities and work they can undertake. Respondents aged over 65 are asked a series of questions about whether they can undertake a range of specific daily tasks. All respondents are asked whether and how many times they visited their GP or hospital in the previous year, whether they experienced an accident which required hospitalisation in the previous year. Finally, a set of questions on use of NHS care private medical insurance bring the health module to a close.

The BHPS also includes the General Health Questionnaire (GHQ) in each wave. The GHQ is comprised of a series of 12 questions in which respondents are asked to identify how frequently they currently feel, relative to their normal state, depression, anxiety leading to insomnia, inability to cope and a number of related feelings (details of the particular questions asked are provided in Appendix 1). Respondents can choose from ‘not at all’, ‘no more than usual’, ‘rather more than usual’ and ‘much more than usual’. Responses to the GHQ forms the basis for the ‘GHQ Caseness Score’, also known as the ‘Caseness GHQ’, a well-known measure of psychological health used in the medical and psychological literature and increasingly in the economics literature as a measure of ‘mental’ or ‘psychological’ health or ‘wellbeing’ (such as Clark, 2003). The GHQ Caseness Score is calculated by counting the number of cases in which an individual reports ‘rather more than usual’ or ‘much more than usual’. Hence a score of 12 indicates the individual reported they feel each of the 12 feelings at least ‘rather more than usual’ and a score of 0 indicates the individual feels each of the 12 feelings not more than ‘no more than usual’. On this basis, a score of 12 represents the lowest level of psychological wellbeing (worst mental health) and a score of 0 represents the highest level of psychological wellbeing (best mental health). Some studies invert this 12-point score, known as the ‘inverted GHQ’ such that a higher value represents a better level of psychological health.

From this health data we identify two measures of ‘psychological health’ which will be used as the dependent variable in the econometric analysis. We use answers to the question on specific health conditions which asks respondents to identify whether they suffer from ‘*anxiety, depression or bad nerves, psychiatric problems*’ as an objective measure of their psychological health which takes a dummy form with a value of 1 for yes and 0 for no. We take the GHQ Caseness Score as a subjective measure of psychological health (on the basis the question is intrinsically subjective by asking respondents to evaluate their current

experience against their ‘usual’ state) which is ordered between 0 and 12, with 12 representing the poorest state of mental health. We also have a subjective general health question (Question 1) available plus the objective data on other medical conditions from which the respondent is suffering.

2.3 Data on Household Finances and Problem Debts

The BHPS asks respondents detailed question on their household finances only every five years (in waves 5, 10 and 15) so it is not possible to construct balance sheet information for each wave of the survey. However, in each wave respondents are asked some questions relating to their finances: detailed questions about their income, the amount they save from their current income, an estimate of the value of their home and any debts secured against it together with the type of mortgage they currently hold and the cost of their monthly housing payment (mortgage or rent). In addition, the head of household is asked in each wave the following questions about their household’s financial situation.

All respondents who either own a home via a mortgage or who rent a home are asked: *“Many people these days are finding it difficult to keep up with their housing payment. In the last twelve months would you say you have had any difficulties paying for your accommodation?(Yes / No)* followed by the question *“In the last twelve months have you ever found yourself more than two months behind with your rent / mortgage”?* (Yes / No). In addition to these questions asked in all waves beginning 1991, since 1995 all respondents who have outstanding unsecured credit on which they are making repayments are asked: *“To what extent is the repayment of such debts and the interest a financial burden on your household? Would you say it is.... A heavy burden, Somewhat of a burden, Not a problem.”*

From answers to the first question we construct a (1/0) dummy variable for the respondent’s subjective evaluation of their difficulty paying for their housing based on the

yes/no answers. We designate this variable to be a subjective response as the interpretation of the term 'difficult' might vary between households. From the second question we similarly construct a (1/0) dummy variable for the respondent's objective housing arrears position based on their yes/no answer. As with the health question responses, the designation of this variable as an objective measure of problem debt is dependent upon individuals being willing to truthfully answer the question. From the third question we construct a (1/0) dummy variable for the respondent's subjective evaluation of their difficulty meeting their unsecured debt payments which takes a value of 1 if the respondent reports 'A heavy burden' or 'somewhat of a burden' and a value of 0 if they report 'not a problem'.

2.4 Combining Subjective Data on Health and Problem Debt

From the responses to health-related questions and problem debt questions in the BHPS we are therefore able to construct one objective measure of poor psychological health (anxiety as a medical condition), one subjective measure of poor psychological health (the GHQ Caseness Index Score), one objective measure of problem debt (2+ months late on housing payment) and two subjective measures of problem debts (whether meeting housing payments presents difficulty to the household, whether consumer credit payments are somewhat of a burden or a heavy burden).

As discussed in the introduction, establishing the direction of causality between households suffering poor mental health and problem debt raises the problem of excluding the reverse causality. A further, and potentially more severe, difficulty in examining the relationship between debt and mental health is the possibility that self-reported measures of problem debt or arrears might themselves be biased by an individual's mental health state. If a respondent's mental health state impacts upon their perception of their financial state, financial data reported by respondents with poor mental health could be unreliable. This is

potentially a severe problem to the researcher seeking to understand the relationship between debt and mental health. By way of illustration of this problem, consider the counter-example of the relationship between unemployment and health. As with the case of debt and health, causality may run in either direction: the depressive effects of unemployment may lead to deterioration in an individual's psychological health or, conversely, deteriorating psychological health might compromise an individual's capacity to work and ultimately lead to redundancy. But it is very unlikely that an individual's psychological health would affect their perception of their labour market state (though it may affect their willingness to report their true labour market state).

However, in the debt-health relationship, an individual's psychological health may affect their perception of the severity of their debt problems or size of their debt 'burden'. It may be the case that individuals with poor psychological health are more likely to perceive a given situation as being problematic compared to individuals with good psychological health, such that the debt-health relationship is purely driven by perception. This might be particularly applicable to subjective measures of problem debt (questions which ask individuals to self-assess how much of a burden they consider their debts to be), answers to which may be biased by the respondent's mental health state. It is also possible that objective measures of problem debt (such as asking individuals to estimate the value of their homes) are biased by an individual's mental health state. If that is the case – and we can trust neither subjective nor so-called objective measures of problem debt - then it will not be possible to make any reliable inferences about the relationship between debt and mental health from self-reported data. Nevertheless, with this caveat, we proceed with an analysis of the relationship between these subjective and objective measures of problem debt and psychological stress.

3. Results

3.1 Cross-Section and Panel Evidence on Problem Debt and Psychological Health

The inequality in psychological health between respondents by their problem debt status is illustrated in Table 1. A relatively large proportion of households report meeting their consumer credit repayments is a burden (16.2%) compared to far fewer who report having been at least 2 months in arrears on their housing payment (2.3%). Using the GHQ Caseness Score measure of subjective psychological health, household heads reporting they have faced difficulties paying for housing in the last year exhibit on average a score of 3.50, compared to 1.87 for those not reporting payment problems. For households who have been 2+ months late with housing payments the inequality is wider at 2.05 points on the GHQ Caseness Score. Household heads reporting their consumer credit commitments are a burden exhibit on average scores 0.89 points higher than those with credit commitments which they do not report to be a burden.

These average differences in GHQ Caseness Scores are non-negligible. By way of comparison, the equivalent average scores for those household heads who report being employed or self-employed is 1.67 compared to an average score of 2.97 among the unemployed – a difference of 1.3 points. Hence in an unconditional comparison, the inequality in psychological health arising from problem debt in the case of payment arrears relating to housing is larger than that arising from unemployment relative to employment.

This clear pattern in the subjective GHQ Caseness Score data of problem debt being associated with poorer psychological health is also exhibited in the objective data on whether individuals are currently experiencing anxiety or related illness as a medical condition. The rate of reporting anxiety among those facing difficulty paying for their housing is 16%, compared with 8% among mortgaged homeowners or renters not reporting difficulty paying

for housing. For the 2+ months late on housing payment the inequality in rates of suffering anxiety is of the magnitude of 11% and for consumer credit payments being a burden it is 6%.

Of course, it would be wrong to conclude from a comparison of average rates of psychological health between the two groups in the cross-section that problem debt causes poor health. Firstly, these differences in psychological health by problem debt status might arise due to associated differences in characteristics pertaining to psychological health between the two groups. Table 2 illustrates that those households exhibiting at least one of the three measures of problem debt differ from those not exhibiting problem debt by a broad range of characteristics. Those who exhibit at least one of the three measures of problem debt (22% of the sample) are typically younger, more likely to be male, less likely to be married, more likely divorced, less likely to be educated to degree or a-level standard, less likely employed, more likely unemployed and exhibit on average lower household monthly income. As the P-values for a test of the equivalence of the means for both groups across these variables reveals, all these differences are significant at the 1% level.

Secondly, differences in psychological health by problem debt status might arise due to a selection effect whereby individuals with poor psychological health are more likely to develop problem debt (or, alternatively, those with better psychological health are more likely to exit a debt problem). Table 3 describes before and after average GHQ Caseness Scores and rates of reporting anxiety for individuals entering problem debt states compared with those not entering problem debt states. The statistics suggest that, on average, half of the observed difference in psychological health by problem debt status arises due to positive selection into problem debt on the basis of poor health. For example, the first two rows illustrate those individuals who develop difficulty paying for their housing exhibited higher average GHQ Scores and average rates of reporting anxiety in the year prior to developing the housing payment problem, compared to those who did not subsequently develop a housing payment

problem in the following year. Whereas in the cross-section those reporting difficulty paying for housing exhibited on average GHQ Caseness scores 1.63 points higher than those not reporting problems, in the transition data the deterioration in GHQ score among those developing difficulties paying for housing is on 0.43 points higher. In the case of those 2+ months late with housing payments and those who face a ‘somewhat or heavy burden’ of consumer credit the difference in the transition is 0.58 (compared with 2.05 in the cross-section) and 0.24 (compared with 0.99 in the cross-section). The rates of suffering anxiety across the transition periods show a similar pattern: those households who develop problem debts exhibited high average rates of suffering anxiety before the onset of the debt problem.

Therefore in each case selection appears to account for most of the cross-sectional difference in average psychological health between the two groups. In each case those not exhibiting the problem debt state in either period show stable GHQ scores. This argument about selection is obviously not relevant for the ‘2+ months late with housing payment’ variable as households may have been very close to 2 months late on their payment in the first period. Consequently, the extent of selection might be over-stated if those households who exhibit problem debt in the period $t+1$ were very close to the threshold point of the underlying latent problem (the number of weeks or months in arrears on housing payment) in period t .

The impact of controlling for these two factors – associated variables and selection into problem debt on the basis of poor psychological health – can be illustrated by the cross-sectional and panel regression models shown in Tables 4 and 5. Table 4 shows estimates from an O.L.S. model estimated over all households with the household’s GHQ Caseness Score as the dependent variable. In the cross-section regressions in Columns 1-4, which control for a variety of associated demographic and socio-economic factors, the pattern in the coefficients on the covariates is as expected: psychological health improves with labour market activity

and income (though only weakly), is worse for men and older individuals. The coefficients on each of the problem debt measures are positive and significant at the 1% level. In a model which includes all three measures, each remains significant at the 1% level, though the magnitude of the coefficient on the 2 months late with housing payment variable weakens substantially. This is consistent with the finding from Bridges and Disney (2010) that financial arrears measures tend to correlate less strongly with psychological health compared with subjective problem debt measures.

The fixed effects estimates in Columns 5-8 exploit within-household changes in problem debt status and psychological health. The transition matrix in Table 3 suggested that household-specific effects accounted for much of the cross-section variation in psychological health. The fixed-effects model is estimated over 11,936 households (10,525 households for the models estimated on those households with outstanding consumer credit). Results indicate that labour market transitions are significantly associated with changes in psychological health in this within-household model. The coefficients on the problem debt variables are smaller in the fixed-effects models, as expected from the results in Table 3. Taking the model in which all the problem debt variables enter (Column 8), the associations between problem debt in this model compared to in the unconditional comparison (values in parenthesis) are: subjective difficulty paying for housing 0.62 (1.63), 2+ months late with housing payment 0.47 (2.05), subjective difficulty paying for consumer credit 0.33 (0.92). Therefore, in each case the magnitude of the association between problem debt and poor psychological health falls by approximately one-third in each case (leaving aside the 2+ months late with housing payment variable).

Table 5 details results from the same models but with the objective measure of psychological health (the 1/0 dummy variable for whether an individual reports suffering from anxiety or a related illness) as the dependent variable. In each regression a linear

probability model is used. Probit and Logit estimates for the models in Columns 1-4 reveal very similar results, for the fixed-effects models the marginal effect on the fixed effect Probit / Logit model is undefined (reference here). The pattern in the results is very similar to that seen in Table 4. In the cross-section regressions employment status, gender and age all significantly impact the likelihood of an individual reporting they suffer an anxiety-related condition. The coefficients on the problem debt variables are all statistically significant at the 1% level and have positive values. Fixed effects estimates are smaller in magnitude than the cross-section equivalents. Comparing the fixed effects coefficients with the unconditional differences again reveals the multivariate within-individual estimates shrink the association between problem debt and ill health by a magnitude of approximately one-half.

These results suggest that, depending on the measure of psychological health used, approximately one-half to two-thirds of the association between problem debt and psychological health observed in the unconditional cross-section comparison between those with and without problem debt is accounted for by controlling for associated characteristics and exploiting within-household changes (to account for simple selection effects). Of course, these results so far cannot be used to conclude that problem debt causes poor psychological health. The fixed effects estimates establish there is a clear association between the onset of problem debt and the worsening of psychological health at the household level controlling for time-invariant heterogeneity, but they do not establish the direction of causality between these.

3.2 Using Exogenous House Price Changes to Understand the Causal Relationship between Problem Debt and Psychological Health

The potential two-way causality in the problem debt – psychological health relationship is a major barrier to the researcher seeking to estimate the causal impact of

problem debt on psychological health. A similar problem confronts the researcher seeking to understand the impact of income on health, as earned income is most likely endogenous to health status (on which see Fritjers, 2005; Gardner and Oswald, 2007). The results from the previous section document the onset of problem debt is associated with deterioration in psychological health, but the causality between these two states might run in either direction. Exploiting the time dimension of panel data is unlikely to lead to a solution to this problem, even if the onset of problem debt pre-dates a reported deterioration in psychological health (or vice versa). An obvious identification strategy is to look for exogenous sources of psychological distress or problem health, that is, a variable correlated with psychological health which is exogenous to changes in individual indebtedness or, conversely, a variable correlated with problem debt which is exogenous to individual changes in psychological health. While for psychological health natural experiments might appear appealing sources of instrumental variation – such as job loss, death of a spouse or diagnosis with a severe physical health condition – all of these are likely also associated with changes in individual finances (such as reduced income).

A search for instruments for problem debt might appear more feasible. The most attractive would be exogenous shocks to income or credit supply. However, both are difficult to measure or observe in microdata. While shocks to credit limits on individual credit lines (such as credit cards or mortgages) would make excellent instruments for problem debt, these are also typically not observed in household survey data. One exogenous and observable source of credit supply shock is movement in the cost of credit (for the U.K. most obviously the Bank of England repo rate against which rates on personal loans and mortgages are typically indexed), but this exogenous source of credit supply cost offers no cross-section variation. Consequently, to the author's knowledge no prior study has attempted to exploit

these exogenous sources of variation in the severity of problem debt as an identification strategy.

This study instead suggests a novel source of exogenous source of variation in the severity of an individual's problem debt: housing equity shocks arising from movements in local-level house prices which make the consequences of arrears on mortgage payments more or less severe. The rationale for this is as follows. Local level house prices movements provide a source of exogenous variation in the equity in a homeowner's residence. Unlike individual mortgage debt, an individual's house price movement is largely exogenous to the actions of the individual household. However, house price movements do impact upon the severity of late or non-payment of mortgage debts via their effect on the housing equity a homeowner owns in their home. If faced with difficulty paying a mortgage it is unambiguously better for an individual to face such a scenario with more rather than less housing equity. More housing equity increases the likelihood of being able to refinance a mortgage onto more favourable terms, and increases the equity buffer if an individual is forced to sell their home. Hurst and Stafford (2004) present evidence that households use housing equity as a source of insurance when faced with income shocks. Therefore, it is possible to evaluate the impact of local level house price movements on psychological health for individuals who do or do not exhibit problems paying for their housing. The null hypothesis under such an exercise is that individuals who exhibit the onset of problems paying for their housing but contemporaneously benefit from a positive housing equity shock will see less deterioration in their psychological health.

Using local level house price shocks as an instrument for the severity of problem mortgage debt also has the attraction of presenting a natural comparison group: renters who experience late payment of their housing payments but do not benefit from increases in the value of the home in which they are resident. There is also an added advantage to the

homeowners – renters comparison: One objection to using house price shocks as a proxy for housing equity movements is that positive house price shocks might also reflect positive local income shocks (which increase housing demand and so cause house values in the locality to increase), comparing the outcomes for renters with homeowners allows a test of whether this is indeed the case.

Using this strategy, Table 6 presents estimates for the impact of housing payment arrears on psychological health (using the GHQ score) allowing for the impact of arrears on health to vary by housing equity gain. To illustrate the IV strategy estimates are presented in a series of stages. In Column 1 the dependent variable is the GHQ score and dependent variables of interest are whether an individual is 2+ months late with their housing payment, the change in the local (county) level house price and the interaction of the two. Local level house price data is obtained from the Halifax Building Society (now Halifax Bank of Scotland) Mix-Adjusted House Price Index, which is available at the county-level.

This model is estimated on homeowners only using individual fixed-effects. Hence the coefficient on the interaction term should be interpreted as the impact of the onset of arrears on mortgage payment for individuals also experiencing a positive house price change in their locality of £10,000. In Column 1 the coefficient on 2 months late with housing payment is positive and significant at the 1% level and the coefficient on the change in the county-level house price is statistically insignificant. Hence house price changes appear not to affect the psychological health of homeowners. However, the interaction term in the third row has a negative and statistically significant coefficient. The interpretation on the coefficient is that an individual who experiences the onset of housing payment arrears but a simultaneous positive increase in local-level house prices of £10,000 experiences less deterioration in their GHQ score compared with an individual who does not experience a positive house price gain. These results suggest that problems with mortgage payments have

less an effect on psychological health when they are accompanied by (exogenous) positive equity shocks.

The robustness of this result is examined in the models shown in Columns 2 and 3. In Column 2, renting households are used as a comparison group. A second interaction term is introduced in the regression which allows the impact of house price movements on households with housing arrears to vary depending on whether they are home owners (with mortgage arrears) or renters (with rent arrears). The coefficient on the interaction term capturing homeowners (row 4) is negative and statistically significant at the 1% level, whereas the interaction term capturing both renters and owner (row 3) is statistically insignificant. The interpretation is as follows: a household experiencing the onset of housing payment arrears experiences on average a deterioration in GHQ score of 1.19 points (row 1), local level house price increases have no effect on this deterioration for renters (row 3), but do have a significant reduction in this effect for homeowners (row 4). These results suggest that house price changes do not simply proxy for local economic conditions in these regressions (which would also benefit renters), but instead do detect a housing equity effect. An alternative robustness test is presented in Column 3. One possible objection to the analysis in Columns 1 and 2 might be that house price movements reflect general local credit market conditions. However, the results from Column 3 suggest this is not the case as the impact on psychological health of the onset of consumer credit problem debt is not affected by the contemporaneous movements in house prices at the local level (rows 6 and 7).

Table 7 presents results from identical models estimated with the (1/0) dummy variable for whether the individual suffers from anxiety or a related condition as the dependent variable. Results here reveal the same pattern as in Table 6: positive local house price movements which accompany the onset of housing payment problems alleviate the impact of the payment problem only on homeowners (Columns 1 and 2) and have

no impact on those households experiencing the onset of consumer credit repayment problems.

Taken together, these results from this novel strategy for estimating the impact of problem debt on psychological health, suggest that exogenous variation in the severity of arrears on housing payment arising from local level house price movements which determine home equity does causally affect the extent of deterioration in psychological health (by either of the measures used). This identification strategy is by no means straightforward or ideal, but presents evidence robust to a variety of instrument-specification tests which verify the result.

3.3 Social Stigma Effects in the Debt-Depression Relationship

This final section in the analysis investigates the existence of social stigma effects in the relationship between problem debt and psychological health. To the author's knowledge, such effects in the relationship between debt and depression have not been investigated elsewhere. This is perhaps surprising: a growing empirical literature in economics finds that individual perceptions and choices are influenced by those of others. This raises the prospect that reference group effects might present in the relationship between problem debt and psychological health. Does the impact of problem debt on an individuals' psychological health depend on the prevalence of problem debt in the local population? Clark (2003) shows the impact of unemployment on psychological health is less severe for individuals who live in localities in which the unemployment rate is higher, and hence is more of a 'social norm' among the population. This finding is contrary to a standard labour market analysis in which higher local unemployment is indicative of fewer job opportunities and would result in increased psychological stress.

The existence of reference group effects is investigated in the following manner. Two contexts for problem debts are considered: problem housing debt in the context of the prevailing local rate of mortgage arrears; and problem consumer credit debts in the context of the prevailing local personal insolvency rate. Mortgage arrears data is provided by the Council for Mortgage Lenders, which collects data from all U.K. mortgage lenders on the proportion of their outstanding mortgages in various stages of arrears and repossession. We use data on the proportion of mortgages at least 3 months in arrears in the region of residence in which the households is located (unfortunately data is not available at a more local level). For bankruptcy data, we use data on the bankruptcy orders issues by courts in England and Wales provided by the Insolvency Service. Unfortunately again data is available only at the regional level, so again the 'reference group' level of bankruptcy is defined at a relatively broad 'local' definition.

Table 8 presents results of the models in which these reference group levels of mortgage arrears and bankruptcy are included in the specification. Column 1 estimates a model over all home-owning individuals with the GHQ Caseness Score as the dependent variable. The reference group effect is captured by interacting the dummy variable for individuals exhibiting 2+ months arrears on their mortgage with the local mortgage arrears rate. Results firstly reveal the rate of local mortgage arrears has no impact on the wellbeing of mortgage holders independent of being in arrears (row 2). However, the coefficient on the interaction term (row 3) implies that individuals experiencing the onset of mortgage arrears in regions in which mortgage arrears are more prevalent see less deterioration in their psychological health scores compared with individuals who exhibit an onset of mortgage arrears in regions with lower mortgage arrears rates. The coefficient value implies this effect is small: a regional mortgage default rate of 10% leads to a 0.24 reduction in the GHQ Caseness Score of an individual who experiences the onset of mortgage arrears, offsetting

approximately one quarter of the negative effect of mortgage arrears on psychological health (row 1).

In Column 2 a similar exercise is undertaken for the case of the subjective consumer credit payments burden question and the regional bankruptcy rate. The interaction term between the two is again statistically significant (at the 1% level) and, taken together with the coefficient on the dummy variable which captures individuals for whom consumer credit is a heavy burden, implies the onset of consumer credit problem debt in a region with a bankruptcy rate of 10% leads to approximately half the deterioration in psychological health which would be experienced at a bankruptcy rate of 0%. Table 9 repeats the exercise from Table 8 with the objective psychological stress measure as the dependent variable. In these specifications the interaction terms on reference-level mortgage arrears and the bankruptcy rate are both negative but not statistically significant.

These results suggest some evidence in favour of the existence of group effects, but only for the subjective measure of psychological health, which may not be surprising. The results indicate that the psychological impact of problem debt, both mortgage debt and consumer credit debt, is less severe for individuals who live in localities in which problem debt is more widespread. This result is in keeping with the finding from the unemployment literature that the effect of unemployment on psychological health is less severe in localities in which unemployment is more prevalent. One interpretation of these results is that the 'social norm' of problem debt, through peer group effects in localities in which problem debt is more prevalent, lessens the anxiety and worry caused by an individual's problem debt.

3. Conclusion

This study has investigated the relationship between problem debt and psychological health, with a particular focus on attempting to understand the causality between the two. The

availability of detailed individual-level microdata on psychological health and over-indebtedness provided opportunity to model the relationship at the individual level, controlling for a wide range of associated factors (including other medical conditions) and exploiting individual fixed effects. The availability of geographic identifiers in the microdata also allows for the matching of local-level data on the prevalence of problem debt into the household survey, on the basis of which a strategy towards estimating the causal relationship could be implemented and reference group effects could be estimated.

Results demonstrate that much of the cross-sectional variation in problem debt and psychological health is attributable to omitted variables and selection. However, although it is difficult to generalise from the IV strategy used in to estimate the causal relationship between problem debt and psychological stress, results show that exogenous factors which make the consequences of problem debt more severe do impact upon respondents' psychological stress. Furthermore, results provide strong evidence that respondents' reactions to problem debt have a non-negligible social dimension in which the prevailing local level of indebtedness impacts on individual psychological stress.

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Table 1
Average Subjective and Objective Psychological Health Measures By Problem Debt Status
BHPS Households 1991 – 2008

	Average (S.D.) GHQ Score	
	Yes	No
Difficulties Paying for Housing	3.50 (3.84) N=6499 (9.7%)	1.87 (2.98) N=60165 (91.3%)
2+ Months Late with Housing Payment	4.04 (4.02) N=1541 (2.3%)	1.99 (3.08) N=65123 (97.7%)
Consumer Credit Repayments a Heavy Burden <i>Years 1995 – 2008 Only</i>	2.87 (3.64) N=8864 (16.2%)	1.88 (3.03) N=45867 (83.8%)
	Proportion (S.D.) Suffering From Anxiety-Related Illness	
	Yes	No
Difficulties Paying for Housing	0.16 (0.37) N=6494 (9.7%)	0.08 (0.27) N=60165 (91.3%)
2+ Months Late with Housing Payment	0.21 (0.41) N=1541 (2.3%)	0.09 (0.28) N=65123 (97.7%)
Consumer Credit Repayments a Heavy Burden <i>Years 1995 – 2008 Only</i>	0.14 (0.35) N=8864 (16.2%)	0.08 (0.28) N=45867 (83.8%)

Table 2			
Average Characteristics of Individuals by Problem Debt Status			
	Individual Answers 'Yes' to at Least 1 of the 3 Problem Debt Questions		P-value for difference
	Yes	No	
<i>N</i>	11,792 (22%)	42939 (78%)	
GHQ12 Score	2.99	1.77	0.0000
Anxiety Health Prob=1	0.15	0.08	0.0000
Age (years)	38.4	40.7	0.0000
Male = 1	0.47	0.41	0.0000
Married = 1	0.63	0.68	0.0000
Divorced = 1	0.18	0.13	0.0000
Degree = 1	0.14	0.18	0.0000
A-Levels = 1	0.20	0.22	0.0009
Employed = 1	0.65	0.69	0.0000
Unemployed = 1	0.06	0.04	0.0000
Monthly Income (£)	£1740	£2195	0.0000

Table 3				
Transition Matrix: Entry into Debt Problems by Psychological Health Measures				
	GHQ12 Score		Suffering Anxiety	
	Average Score at <i>t</i>	Average Score at <i>t+1</i>	Proportion at <i>t</i>	Proportion at <i>t+1</i>
Difficulties Paying for Housing at <i>t=0</i> and Difficulties Paying for Housing at <i>t+1=1</i> <i>N=2413</i>	2.97 (3.59)	3.40 (3.87)	0.14 (0.35)	0.16 (0.37)
Difficulties Paying for Housing at <i>t=0</i> and Difficulties Paying for Housing at <i>t+1=0</i> <i>N=42134</i>	1.78 (2.90)	1.80 (2.95)	0.07 (0.26)	0.07 (0.26)
2+ Months Late with Housing Payment at <i>t=0</i> and 2+ Months Late with Housing Payment at <i>t+1=1</i> <i>N=648</i>	3.48 (3.88)	4.06 (4.16)	0.19 (0.39)	0.24 (0.43)
2+ Months Late with Housing Payment at <i>t=0</i> and 2+ Months Late with Housing Payment at <i>t+1=0</i> <i>N=43899</i>	1.93 (3.03)	1.94 (3.07)	0.08 (0.27)	0.08 (0.27)
Consumer Credit a Heavy Burden at <i>t=0</i> and Consumer Credit A Heavy Burden at <i>t+1=1</i> <i>N=3561</i>	2.42 (3.37)	2.64 (3.53)	0.12 (0.32)	0.12 (0.33)
Consumer Credit a Heavy Burden at <i>t=0</i> and Consumer Credit A Heavy Burden at <i>t+1=0</i> <i>N=31949</i>	1.78 (2.94)	1.78 (2.96)	0.08 (0.27)	0.08 (0.27)

Table 4
Relationship Between Problem Debt and GHQ12 Score, (O.L.S. Estimates)

<i>Dependent Variable: GHQ12 Score</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Difficulties Paying for Housing = 1	1.34** (0.04)	-	-	1.15** (0.05)	0.77** (0.04)	-	-	0.62** (0.05)
2+ Months Late Hous. Paymt = 1	-	1.56** (0.08)	-	0.52** (0.11)	-	0.96** (0.08)	-	0.47** (0.11)
Consumer Credit a Heavy Burden = 1	-	-	0.88** (0.04)	0.75** (0.04)	-	-	0.37** (0.04)	0.33** (0.04)
Age (Years)	0.11** (0.01)	0.11** (0.01)	0.10** (0.01)	0.11** (0.01)	0.09** (0.01)	0.09** (0.01)	0.08** (0.02)	0.08** (0.02)
Age Squared (Years)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)
Male = 1	0.43** (0.03)	0.44** (0.05)	0.45** (0.03)	0.48** (0.03)	-	-	-	-
Married = 1	0.14** (0.05)	0.15** (0.05)	0.14** (0.05)	0.12** (0.05)	0.05 (0.08)	0.04 (0.07)	-0.03 (0.09)	-0.02 (0.09)
Divorced = 1	0.45** (0.04)	0.49** (0.04)	0.49** (0.05)	0.48** (0.05)	0.43** (0.08)	0.44** (0.08)	0.45** (0.09)	0.43** (0.10)
Employed = 1	-1.29** (0.05)	-1.29** (0.05)	-1.32** (0.05)	-1.52** (0.05)	-0.85** (0.06)	-0.85** (0.06)	-0.84** (0.06)	-0.85** (0.07)
Unemployed = 1	0.24** (0.06)	0.20** (0.06)	0.17** (0.07)	0.32** (0.07)	0.30** (0.07)	0.31** (0.07)	0.33** (0.08)	0.31** (0.08)
Self-Employed = 1	-1.33** (0.05)	-1.33** (0.05)	-1.39** (0.06)	-1.61** (0.06)	-0.85** (0.07)	-0.85** (0.07)	-0.85** (0.09)	-0.86** (0.09)
Has Children = 1	-0.23 (0.05)	-0.22** (0.05)	-0.23** (0.06)	-0.20** (0.06)	-0.17** (0.05)	-0.17** (0.05)	-0.15* (0.06)	0.15** (0.06)
Monthly Income (Pounds)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)
Other Health Conditions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
No. Observations	65841	65841	54030	54030	65841	65841	54030	54030
F	168.69	149.41	133.67	141.83	29.51	24.88	17.02	21.89
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R-squared	0.10	0.09	0.09	0.10	0.10	0.09	0.09	0.08
No. Groups	-	-	-	-	11936	11936	10525	10525

*denotes significance at 5% level, **denotes significance at 1% level. Additional control variables: dummy variables for spouse educational and employment / self-employment status, dummy variables for skill group (professional, skilled, semi-skilled; dummy variables for age of youngest child (0-3years, 3-5 years, 5-12 years, 12-16 years), dummy variables for whether member of occupational pension plan, whether moved home in last year, whether smokes, spouse smokes, plus value of total outstanding mortgage debt in pounds.

Table 5
Relationship Between Problem Debt and Suffering Anxiety, (LPM. Estimates)

<i>Dependent Variable: Suffers Anxiety (1/0)</i>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Difficulties Paying for Housing = 1	0.05** (0.01)	-	-	0.05** (0.01)	0.02** (0.001)	-	-	0.02** (0.001)
2+ Months Late Housing Paymt = 1	-	0.08** (0.01)	-	0.06** (0.01)	-	0.03** (0.01)	-	0.03** (0.01)
Consumer Credit a Heavy Burden = 1	-	-	0.05** (0.01)	0.04** (0.01)	-	-	0.01** (0.00)	0.01** (0.003)
Age (Years)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)	0.01** (0.00)
Age Squared (Years)	-.001** (0.00)	-.001** (0.00)	-.001** (0.00)	-.001** (0.00)	-.001** (0.00)	-.001** (0.00)	-.001** (0.00)	-.001** (0.00)
Male = 1	0.04** (0.00)	0.04** (0.00)	0.04** (0.00)	0.04** (0.00)	-	-	-	-
Married = 1	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Divorced = 1	0.04** (0.01)	0.04** (0.01)	0.04** (0.01)	0.04** (0.01)	0.03** (0.01)	0.03** (0.01)	0.03** (0.01)	0.03** (0.01)
Employed = 1	-0.15** (0.01)	-0.16** (0.01)	-0.16** (0.01)	-0.16** (0.01)	-0.07** (0.01)	-0.07** (0.01)	-0.06** (0.01)	-0.07** (0.01)
Unemployed = 1	0.11** (0.01)	0.11** (0.01)	0.11** (0.01)	0.11** (0.01)	0.05** (0.01)	0.05** (0.01)	0.05** (0.01)	0.05** (0.01)
Self-Employed = 1	-0.16** (0.01)	-0.16** (0.01)	-0.16** (0.01)	-0.17** (0.01)	-0.07** (0.01)	-0.07** (0.01)	-0.07** (0.01)	-0.07** (0.01)
Has Children = 1	-0.01** (0.00)	-0.01** (0.00)	-0.01** (0.00)	-0.01** (0.00)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Monthly Income (Pounds)	-3e ⁻⁶ ** (8e ⁻⁷)	-3e ⁻⁶ ** (8e ⁻⁷)	-3e ⁻⁶ ** (8e ⁻⁷)	-3e ⁻⁶ ** (9e ⁻⁷)	-1e ⁻⁶ (9e ⁻⁷)	-1e ⁻⁶ (9e ⁻⁷)	-8e ⁻⁶ (9e ⁻⁷)	-1e ⁻⁶ (9e ⁻⁷)
Other Health Conditions	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	No	No	No	No	Yes	Yes	Yes	Yes
No. Observations	65841	65841	54030	54030	65841	65841	54030	54030
F	180.47	178.74	167.08	165.23	14.60	14.46	8.33	8.99
Prob>F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R-squared	0.10	0.10	0.12	0.12	0.06	0.09	0.09	0.08
No. Groups	-	-	-	-	11936	11936	10525	10525

*denotes significance at 5% level, **denotes significance at 1% level. Additional control variables: dummy variables for spouse educational and employment / self-employment status, dummy variables for skill group (professional, skilled, semi-skilled; dummy variables for age of youngest child (0-3years, 3-5 years, 5-12 years, 12-16 years), dummy variables for whether member of occupational pension plan, whether moved home in last year, whether smokes, spouse smokes plus value of total outstanding mortgage debt in pounds..

Table 6			
Exogenous House Price Changes, Problem Debt and GHQ12 Score (O.L.S. Estimates)			
<i>Dependent Variable:</i> <i>GHQ12 Score</i>	(1) Owners Only	(2) Robustness: Renters Comparison Group	(3) Robustness: Consumer Credit Problems
2+ Months Late Housing Paymt = 1	1.29** (0.16)	1.19** (0.11)	-
Change in real county-level house price (£'0,000s)	-0.009 (0.01)	-0.01 (0.01)	-0.02 (0.01)
2+Months Late Housing Paymt = 1 * Change in real county-level house price (£'0,000s)	-0.39** (0.14)	0.18 (0.17)	-
2+Months Late Housing Paymt = 1 * Change in real county-level house price (£'0,000s) *Home Owner	-	-0.52** (0.11)	-
Consumer Credit a Heavy Burden = 1	-	-	0.40** (0.05)
Consumer Credit a Heavy Burden = 1 * Change in real county-level house price (£'0,000s)	-	-	0.01 (0.04)
Consumer Credit a Heavy Burden = 1 * Change in real county-level house price (£'0,000s) * Home Owner	-	-	-0.01 (0.05)
Other Health Conditions	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes
No. Observations	46776	65841	54030
F	6.14	7.16	5.81
Prob>F	0.0000	0.0000	0.0000
No. Groups	8713	11936	10525

*denotes significance at 5% level, **denotes significance at 1% level. Additional control variables as Table 5.

Table 7
Exogenous House Price Changes, Problem Debt and Suffering Anxiety (L.P.M. Estimates)

<i>Dependent Variable:</i> <i>Whether Suffers Anxiety (1/0)</i>	(1) Owners Only	(2) Robustness: Renters Comparison Group	(3) Robustness: Consumer Credit Problems
2+ Months Late Housing Paymt = 1	0.02** (0.004)	0.02** (0.008)	-
Change in real county-level house price (£'0,000s)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
2+Months Late Housing Paymt = 1 * Change in real county-level house price (£'0,000s)	-0.005** (0.001)	0.01 (0.02)	-
2+Months Late Housing Paymt = 1 * Change in real county-level house price (£'0,000s) *Home Owner	-	-0.004** (0.001)	-
Consumer Credit a Heavy Burden = 1	-	-	0.01** (0.003)
Consumer Credit a Heavy Burden = 1 * Change in real county-level house price (£'0,000s)	-	-	0.002 (0.003)
Consumer Credit a Heavy Burden = 1 * Change in real county-level house price (£'0,000s) * Home Owner	-	-	-0.007 (0.005)
Other Health Conditions	Yes	Yes	Yes
Regional Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes
No. Observations	46776	65841	54030
F	2.28	3.17	2.34
Prob>F	0.0000	0.0000	0.0000
R-squared	0.01	0.01	0.01
No. Groups	8713	11936	10525

*denotes significance at 5% level, **denotes significance at 1% level. Additional control variables as Table 5.

Table 8		
Reference Group Effects: Regional Bankruptcy / Repossession Rates and Effects of Problem Debts on Psychological Health: GHQ12 Measure (O.L.S.)		
<i>Dependent Variable:</i> <i>GHQ12 Score</i>	(1) Repossession Rate (Owners Only)	(2) Bankruptcy Rate
2+ Months Late Housing Paymt = 1	1.06** (0.09)	-
Repossession Rate (per 100 mortgage properties)	0.01 (0.02)	-
2+Months Late Housing Paymt = 1 * Repossession Rate (per 100 mortgaged properties)	-0.24* (0.10)	-
Consumer Credit a Heavy Burden = 1	-	0.41** (0.05)
Bankruptcy Rate (per 100 households)	-	0.45 (0.53)
Consumer Credit a Heavy Burden = 1 * Bankruptcy Rate (per 100 households)	-	-0.22** (0.64)
Other Health Conditions	Yes	Yes
Regional Dummies	Yes	Yes
Year Dummies	Yes	Yes
Fixed Effects	Yes	Yes
No. Observations	46776	54030
F	2.18	2.86
Prob>F	0.0000	0.0000
R-squared	0.01	0.01
No. Groups	8713	10525

*denotes significance at 5% level, **denotes significance at 1% level. Additional control variables as Table 5.

Table 9		
Reference Group Effects: Regional Bankruptcy / Repossession Rates and Effects of Problem Debts on Psychological Health: Suffering Anxiety (L.P.M.)		
<i>Dependent Variable: Suffers Anxiety (1/0)</i>	(1) Repossession Rate (Owners Only)	(2) Bankruptcy Rate
2+ Months Late Housing Paymt = 1	0.02** (0.006)	-
Repossession Rate (per 100 mortgage properties)	-0.01 (0.01)	-
2+Months Late Housing Paymt = 1 * Repossession Rate (per 100 mortgaged properties)	0.005 (0.004)	-
Consumer Credit a Heavy Burden = 1	-	0.01** (0.003)
Bankruptcy Rate (per 100 households)	-	0.21 (0.18)
Consumer Credit a Heavy Burden = 1 * Change in real county-level house price (£'0,000s) * Home Owner	-	-1.45 (0.84)
Regional Dummies	Yes	Yes
Year Dummies	Yes	Yes
Fixed Effects	Yes	Yes
No. Observations	46776	54030
F	2.05	2.16
Prob>F	0.0000	0.0000
R-squared	0.01	0.01
No. Groups	8713	10525

*denotes significance at 5% level, **denotes significance at 1% level. Additional control variables as Table 5.

Appendix 1: Selected BHPS Health Questions in Full

1. Specific Health Conditions Question in Full

'Do you have any of the health problems or disabilities listed on this card? You can just tell me which numbers apply:

- *None*
- *Problems or disability connected with: arms, legs, hands, feet back, or neck (including arthritis and rheumatism)*
- *Difficulty in seeing (other than needing glasses to read normal size print)*
- *Difficulty in hearing*
- *Skin conditions/allergies*
- *Chest/breathing problems, asthma, bronchitis*
- *Heart/high blood pressure or blood circulation problems*
- *Stomach/liver/kidneys or digestive problems*
- *Diabetes*
- *Anxiety, depression or bad nerves, psychiatric problems*
- *Alcohol or drug related problems*
- *Epilepsy*
- *Migraine or frequent headaches*
- *Cancer*
- *Stroke*
- *Other health problems (PLEASE GIVE DETAILS)'*

2. General Health Questionnaire in Full

" Here are some questions regarding the way you have been feeling over the last few weeks. For each question please ring the number next to the answer that best suits the way you have felt."

The first question is:

"Have you recently been able to concentrate on whatever you're doing?"

With four possible answers:

*"Better than usual ...
Same as usual . . .
Less than usual...
Much less than usual..."*

The next six questions are:

*"Have you recently lost much sleep over worry?
Have you recently felt constantly under strain?
Have you recently felt you couldn't overcome your difficulties?"*

*Have you recently been feeling unhappy or depressed?
Have you recently been losing confidence in yourself?
Have you recently been thinking of yourself as a worthless person”*

With the four possible answers:

*“Not at all ...
No more than usual ...
Rather more than usual ...
Much more than usual ...”*

The next five questions are:

*“Have you recently felt that you were playing a useful part in things?
Have you recently felt capable of making decisions about things?
Have you recently been able to enjoy your normal day-to-day activities?
Have you recently been able to face up to problems?
Have you recently been feeling reasonably happy, all things considered?”*

With four possible responses:

*“More so than usual ...
About same as usual...
Less so than usual ...
Much less than usual ...”*