

Taylor, Mark P.; Pevalin, David J.; Todd, Jennifer

Working Paper

The psychological costs of unsustainable housing commitments

ISER Working Paper Series, No. 2006-08

Provided in Cooperation with:

Institute for Social and Economic Research (ISER), University of Essex

Suggested Citation: Taylor, Mark P.; Pevalin, David J.; Todd, Jennifer (2006) : The psychological costs of unsustainable housing commitments, ISER Working Paper Series, No. 2006-08, University of Essex, Institute for Social and Economic Research (ISER), Colchester

This Version is available at:

<https://hdl.handle.net/10419/92149>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



The Psychological Costs of Unsustainable Housing Commitments

Mark P. Taylor , David J. Pevalin and Jennifer Todd

ISER Working Paper
2006-08

Institute for Social and Economic Research

The Institute for Social and Economic Research (ISER) specialises in the production and analysis of longitudinal data. ISER incorporates the following centres:

- ESRC Research Centre on Micro-social Change. Established in 1989 to identify, explain, model and forecast social change in Britain at the individual and household level, the Centre specialises in research using longitudinal data.
- ESRC UK Longitudinal Studies Centre. A national resource centre for promoting longitudinal research and for the design, management and support of longitudinal surveys. It was established by the ESRC as independent centre in 1999. It has responsibility for the British Household Panel Survey (BHPS).
- European Centre for Analysis in the Social Sciences. ECASS is an interdisciplinary research centre which hosts major research programmes and helps researchers from the EU gain access to longitudinal data and cross-national datasets from all over Europe.

The British Household Panel Survey is one of the main instruments for measuring social change in Britain. The BHPS comprises a nationally representative sample of around 9,000 households and over 16,000 individuals who are reinterviewed each year. The questionnaire includes a constant core of items accompanied by a variable component in order to provide for the collection of initial conditions data and to allow for the subsequent inclusion of emerging research and policy concerns.

Among the main projects in ISER's research programme are: the labour market and the division of domestic responsibilities; changes in families and households; modelling households' labour force behaviour; wealth, well-being and socio-economic structure; resource distribution in the household; and modelling techniques and survey methodology.

BHPS data provide the academic community, policymakers and private sector with a unique national resource and allow for comparative research with similar studies in Europe, the United States and Canada.

BHPS data are available from the UK Data Archive at the University of Essex
<http://www.data-archive.ac.uk>

Further information about the BHPS and other longitudinal surveys can be obtained by telephoning +44 (0) 1206 873543.

The support of both the Economic and Social Research Council (ESRC) and the University of Essex is gratefully acknowledged. The work reported in this paper is part of the scientific programme of the Institute for Social and Economic Research.

Acknowledgement:

This work was funded by a research grant from the British Academy (LRG-37300). BHPS data are available from the UK Data Archive (www.data-archive.ac.uk). This work also forms part of the scientific programme of the Institute for Social and Economic Research and support from the ESRC and the University of Essex is gratefully acknowledged.

Readers wishing to cite this document are asked to use the following form of words:

Taylor, Mark, Pevalin, David and Todd, Jennifer (March 2006) 'The Psychological Costs of Unsustainable Housing Commitments', ISER Working Paper 2006-08. Colchester: University of Essex.

For an on-line version of this working paper and others in the series, please visit the Institute's website at: <http://www.iser.essex.ac.uk/pubs/workpaps/>

Institute for Social and Economic Research
University of Essex
Wivenhoe Park
Colchester
Essex
CO4 3SQ UK
Telephone: +44 (0) 1206 872957
Fax: +44 (0) 1206 873151
E-mail: iser@essex.ac.uk
Website: <http://www.iser.essex.ac.uk>

© March 2006

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form, or by any means, mechanical, photocopying, recording or otherwise, without the prior permission of the Communications Manager, Institute for Social and Economic Research.

ABSTRACT

We explore the impact of unsustainable housing commitments on psychological well-being using data from the British Household Panel Survey. We test the hypotheses that (i) housing payment problems, housing arrears and the threat of eviction and repossession have adverse impacts on heads of household's psychological well-being over and above those caused by financial hardship and (ii) these impacts are larger for homeowners than for tenants. Our results indicate that for both men and women persistent housing payment problems have significant psychological costs. We find that for men entering arrears and the imminent threat of home loss has deleterious impacts on psychological health. The sizes of these effects are independent of and larger in magnitude to those associated with financial hardship more generally. We also find housing payment arrears have a significantly greater impact on psychological well-being among homeowners than tenants.

NON-TECHNICAL SUMMARY

Since 1991, more than half a million households in Britain have had their homes repossessed and more than one million eviction orders have been made. Such events incur considerable financial costs, but what impact does the threat of losing one's home have on an individual's psychological well being? As house purchase is typically the largest financial commitment made during a lifetime and housing loans are the largest single element of personal sector debt, we expect repossessions and evictions to have considerable psychological costs. Furthermore, although repossessions and evictions symbolise the most dramatic form of unsustainable housing commitments, they may result from an accumulation of arrears which themselves cause anxiety and stress. We use panel data to explicitly test the hypotheses that (i) housing payment problems, arrears and the threat of eviction or repossession adversely affect a householder's psychological well-being over and above the impact of negative financial shocks and financial hardship more generally; and (ii) that these effects are larger among homeowners than for tenants.

We use data from the British Household Panel Survey (BHPS) which provide information on individual and household characteristics on an annual basis from 1991 to 2003. These data have several advantages. Firstly, they contain annual information on housing finance problems and the severity of such problems – we can identify which households were having problems meeting their housing costs and which of these were in arrears. In addition, each sample member who changes address between interviews is asked the reasons for doing so, allowing us to identify those who suffered an eviction or repossession. Secondly, the data contain an objective measure of mental well-being derived from the General Health Questionnaire (GHQ). Thirdly the data include rich information on a wide range of factors that determine both psychological health and reflect the severity of financial problems. We can identify households that are in financial hardship and the degree of financial hardship they face, that experience negative income shocks or other events that affect psychological well-being, and distinguish the additional psychological costs associated with unsustainable housing commitments. Finally the panel nature of these data means we can observe GHQ scores both before and after events occur and can examine changes in psychological health. We can estimate panel data models that allow for time-invariant psychological characteristics.

Descriptive statistics indicate that unsustainable housing commitments are highly correlated with financial disadvantage and a range of negative shocks, both financial and labour market related. Such shocks also affect an individual's psychological well-being. Mental well-being is inversely related to being in low income, to being unable to save regularly, to having housing payment problems and being in payment arrears. Individuals who experienced negative financial shocks already had significantly worse mental health than average prior to the events, and the experience of the negative shock incurs an additional substantial psychological cost. Results from multivariate analysis indicate that for men arrears and housing payment problems incur significant psychological costs, even when controlling for financial hardship and negative financial shocks, individual and household characteristics and latent time-invariant individual characteristics. These psychological costs are larger for arrears than for payment problems, and are equivalent in size to those associated with unemployment or marital dissolution. Imminent eviction or repossession is also associated with a decrease in mental well-being, particularly if it results from persistent payment problems. For women, it is persistent exposure to unsustainable housing commitments that incur psychological costs. The psychological costs of arrears are larger among homeowners than tenants, supporting our hypotheses. Such costs need to be incorporated when assessing the impact of housing market recessions in order accurately reflect their true welfare consequences.

The psychological costs of unsustainable housing commitments

1. Introduction

Since 1991, more than half a million households in Britain have had their homes repossessed and more than one million eviction orders have been made on behalf of social and private landlords (ODPM 2005). Repossession and eviction incur considerable financial costs (penalties, interest payments, legal fees etc.) which may put families at risk of poverty. But what impact does the threat of losing one's home have on an individual's psychological well being? Considering that house purchase is typically the largest financial commitment made during a lifetime and that housing loans are the largest single element of personal sector debt (MacLennan 1997), we expect repossessions and evictions to have considerable impacts on the psychological health of householders. Furthermore, although repossessions and evictions symbolise the most dramatic form of unsustainable housing commitments, they may result from an accumulation of rent and mortgage arrears which themselves are likely to cause anxiety and stress. We use panel data to investigate the psychological costs of falling into housing payment problems, arrears and the threat of eviction and repossession. We explicitly test the hypotheses that (i) housing payment problems, arrears and the threat of eviction or repossession adversely affect a householder's psychological well-being over and above the impact of negative financial shocks and financial hardship more generally; and (ii) that these effects are larger among homeowners than for tenants.

Statistics indicate that more than 350,000 households in Britain were in mortgage arrears and 75,500 were repossessed in 1992 (ODPM 2005). This followed the boom of the late 1980s that originated in the liberalisation of financial markets and the increase in competition in the mortgage market. It became easier for more people to borrow a larger proportion of both the house value and their income, and there was a rise in household sector mortgage debt from 25% of annual disposable income in 1980 to 75% in 1992 (Brookes et al 1994). A subsequent tightening of monetary policy saw a sharp rise in interest rates and unemployment, resulting in the longest sustained period of depressed housing market activity in recent times (Malpass &

Murie 1999). As the housing market stabilised, there was an equally dramatic decline in the number of households facing arrears and repossession. By 2003 fewer than 10,000 homes were repossessed and 50,000 households were in arrears. However, there remained more than 160,000 households who struggled to meet the costs of their housing. Evidence suggests that unsustainable housing commitments will continue, in part because of the increased insecurity of social and economic life (Ford and Wilcox 1998; Wilkinson 1996).

The theoretical literature on arrears, repossession and eviction mostly focuses on option pricing theory. Rational mortgage default occurs when the value of the property falls below the value of the mortgage (Kau et al 1995; Kau & Keenan 1999). Even in this situation however, the presence of transaction costs or the value of future default options may prevent default (Foster & van Order 1984; Kau et al 1995). In contrast, the ability-to-pay hypothesis suggests that borrowers default when their income falls below that required to service their debt (Lambrecht et al 1997). In Britain defaulting on a mortgage does not absolve the borrower from liability to the lender and will severely limit the availability of future housing or other loans. This makes households less inclined to default voluntarily.

Empirical work highlights the importance of structural factors (e.g. interest rates, income-to-loan ratios), income and expenditure factors (e.g. unemployment, poor health, marital dissolution, unanticipated financial problems) and personal factors (e.g. financial management skills, personal preferences) in determining arrears and repossession (Doling et al 1988; Ford 1993; Ford & Burrows 1999; Böheim & Taylor 2000). Job loss, a fall in earnings and relationship breakdown are highly correlated with mortgage and rent arrears. Households with younger heads have been found to be more at risk as they typically have less experience in managing financial affairs and also face higher rates of job mobility and more inconsistent income streams (Lea et al 1993; Nettleton & Burrows 1998; Böheim & Taylor 2000). Older households have had more time to accumulate savings to cushion against times of unexpected financial hardship. In Britain ability-to-pay (captured by income and employment status of household members) is more important than equity factors in determining arrears, evictions and repossessions (Böheim & Taylor 2000).

There are few studies that specifically examine the impact of problem debt and income on psychological health. These show a strong relationship between financial distress (low living standards and poverty) and psychological problems and depression (Marmot et al 1997; Weich & Lewis 1998; Brown et al 2005). However the direction of causality is sometimes unclear. Roberts et al (1998) suggest that low levels of mental health reduce the ability to manage finances successfully, although analyses of longitudinal data indicate that financial debt causes psychological problems (Marmot et al 1997; Webley & Nyhus 2001; Stradling 2001). A stronger association between perceived financial difficulties and psychological health has also emerged (Wildman and Jones 2002; Wildman 2003). The onset of mortgage indebtedness and keeping up with mortgage payments has been shown to cause anxiety and the fear of losing one's home (Ford et al 1995; Davis & Dhooge 1992; Nettleton & Burrows 1998). Brown et al (2005) find that consumer (but not mortgage) debt is associated with increased levels of psychological distress.

There is a wider and long-established literature on the role of the home, housing and urban environment in determining psychological health, with mental stress strongly correlated with housing type (Fanning 1967; Cappon 1971; Edwards et al 1982). The home, and particularly homeownership, allows control of physical space, the assertion of identity and provides psychic and physical security (Porteous 1976). Home ownership serves as a financial investment that offers a sense of control and security and allows households to make independent decisions about the appearance of the dwelling and its furnishings. In contrast tenants lack this control (Foley 1980; Hahn 1993). Early studies indicate that removing an individual from their home incurs a dramatic decline in health (Ellenberger 1971; Fried 1963).

Our contribution to this literature is to assess the impact of unsustainable housing commitments (payment problems, arrears, the threat of eviction and repossession) on psychological health when allowing for other confounding factors and disruptive life events such as negative financial shocks, marital dissolution and job loss. We distinguish the impact of unsustainable housing debt from the associated negative income shocks and low income more generally and disentangle the complex sequence of events that contribute to households finding themselves with unsustainable housing commitments. We add to previous work by Nettleton and Burrows

(1998) by focusing on both home-owners and tenants, and by examining the impact of the threat of eviction and repossession. Our hypothesis is that unsustainable housing commitments have adverse effects on heads of household's psychological health independent from that of the associated negative financial shock. We suggest that the threat of home loss has a larger impact for owner-occupiers, who make financial, psychological and emotional investments in their home, than for tenants, who move more frequently and are less attached to their place of residence (Böheim and Taylor 2002). We anticipate this relationship to be most apparent for heads of households, who are mainly responsible for meeting housing costs and for the well-being of the household. Our research strategy is to: (i) identify heads of households who experience housing payment problems, arrears, and those who are evicted or repossessed; (ii) examine the impact of such events on psychological health when allowing for low income more generally, negative financial shocks and other potentially confounding and correlated factors; and (iii) to test whether there are differences between home owners and tenants.

2. Data

We use data from the British Household Panel Survey (BHPS) which provide information on individual and household characteristics from 1991 to 2003. The first wave was designed as a nationally representative random sample of the population of Great Britain living in private households in 1991. These original respondents and any adult co-residents are interviewed at annual intervals. These data have several advantages over other possible datasets.

Firstly, they contain annual information on housing finance problems and the severity of such problems. Each head of household is asked, "Have you had problems paying for your housing over the last 12 months?" If so they are then asked "Over the last 12 months were you ever two months or more late with your rent/mortgage payments?" Therefore we can identify which households were having problems meeting their housing costs and which of these were in arrears. In addition, each sample member who changes address between interviews is asked the reasons for doing so, allowing us to identify those who suffered an eviction or repossession. We can therefore compare the psychological health of those who were subsequently repossessed or evicted from their home with those in housing payment problems or in arrears but who did not subsequently lose their home.

Secondly, the data contain an objective measure of mental well-being derived from the General Health Questionnaire (GHQ). This is a reliable indicator of psychological health (Argyle 1989), is widely used in the medical literature (Goldberg 1972, 1978) and has been shown to be robust to retest effects in the BHPS (Pevalin 2000). It is the most widely applied self-completion assessment measure of psychiatric disturbance in the UK (McCabe et al 1996). We use the 36-point ‘likert’ version of the GHQ12 score, in which responses to each question are summarised on a scale from 0 to 3. (Details are provided in Appendix A.) This results in a total GHQ12 score ranging from 0 to 36 where high scores correspond to low psychological well-being (high levels of stress). (Note however that our results are robust to using the 12-point ‘caseness’ scale.)

A third advantage of BHPS data is that they include rich information on a wide range of factors that determine both psychological health and reflect the severity of financial problems. The annual questionnaire elicits information on household income and finances, savings behaviour, earnings, labour market status, job and employer characteristics and recent employment histories, housing tenure and conditions, household composition, and education at each date of interview. Furthermore, from 1996 onwards, information is collected on a number of financial hardship indicators that identify the ability of the household to afford to keep their home adequately warm, an annual holiday, to replace worn out furniture, to buy new clothes, to eat meat on alternate days and to feed visitors at least once a month. We can therefore identify households that are in financial hardship and the degree of financial hardship they face, that experience negative income shocks or other events that affect psychological well-being, and distinguish the additional psychological costs associated with unsustainable housing commitments.

A final advantage of these data is their panel nature. We observe GHQ12 scores both before and after events occur and can examine changes in rather than levels of psychological health. We can also estimate panel data models that allow for time-invariant individual-specific unobserved effects that may otherwise bias the coefficients of interest. Latent time-invariant psychological characteristics have been found to systematically influence reported well-being scores (De Neve

& Cooper 1999) and estimation methods that do not allow for such time-invariant unobserved traits are likely to result in biased estimates.

We extract an estimating subsample from these data and focus on working age heads of households (men aged 16-64, women aged 16-59). We focus on household heads as by definition they are responsible for meeting housing payments and will play the lead role in household financial decision making. We expect them to bear the main psychological costs of any consequences.¹ We use an unbalanced panel and allow heads of households to enter and leave the sample over time. We exclude from the analysis any observations where the head of household lived in rent- or mortgage-free accommodation (these are not at risk of housing payment difficulties), full-time students (who live in temporary accommodation and move frequently) or who had missing data on any relevant variables.

3. Summary statistics

Table 1 summarises the variables of interest for male heads of households. This indicates that the general trends in the BHPS data accurately reflect the national trend, with falls in the proportion of households experiencing payment problems, arrears, evictions and repossessions since the housing market recession of the early 1990s.² About 1.3% of heads of households reported arrears in 2002, down from 5% in 1991. There was also a fall in the proportion reporting problems meeting their housing payments, from exceeding 16% at the height of the housing recession to fewer than 7% in 2002. Despite this fall, heads of households were more likely to have problems meeting housing payments than be unemployed. About 1% of households suffered an eviction or repossession each year over the period. There is evidence of a

¹ Analysis of other household members reveals that, for men, this is very much the case. The psychological costs of unsustainable housing commitments are significantly larger among male heads of households than among other male household members. However the psychological costs of arrears and housing payment problems are larger among other female household members (typically the head of households spouse) than for female heads of households.

² This decline could also reflect differential attrition rates between those in arrears and other households. We find that interviews were completed with all household members in 91% of households with no housing finance problems, compared with 87% of households that were in arrears at the previous date of interview. However, interviews were carried out with at least one household member in 99% of all households, and 97% of households that were previously in arrears. McCulloch (2001) finds evidence of GHQ-12 related attrition in the BHPS, but this is limited to the cohort of men and women aged over 64 years of age. We instead focus on those of working age. Wildman (2003) finds little evidence of selection bias in the BHPS caused by differential attrition rates by income and GHQ scores.

small decline in this proportion since the mid 1990s, again reflecting trends in the housing market.

How does the experience of unsustainable housing commitments relate to other measures of financial hardship or negative income shocks more generally? Table 2 summarises the percentage of individuals in each form of unsustainable housing commitment by a range of events. For example, the first row indicates that 43.6% of those with payment problems in t-1 had payment problems at t compared with 9% of the sample as a whole. More than one half of those in arrears at t-1 had payment problems at t indicating a high degree of persistence in unsustainable housing commitments. The likelihood of being in housing payment problems is also greater than average for heads of households who were in low income, who recently entered low income, who were not working, and who had left employment since the previous year. (We define low income as being in the bottom quartile of the equivalised household income distribution in the relevant year.) It was particularly large, at about double the average, for heads of households who entered low income since the previous year (18.8%), or who had lost their job since the previous year (19.6%), which illustrates the role of negative shocks in triggering housing payment problems.

The next column indicates that about 13% of those in housing payment problems in the previous year and 31% of those in arrears in the previous year were currently in arrears, again indicating a high degree of persistence in unsustainable housing commitments. Almost 23% of those currently with housing payment problems were in payment arrears. Otherwise, the prevalence of arrears was highest for heads of households that were in low income either currently or last year (5%), who had entered low income since the previous year (5.5%), or who had left employment since the previous year (6.5%). The final column focuses on households that were evicted within the next year (between t and t+1), and were therefore facing the imminent threat of home loss at t. Imminent eviction is most correlated with current payment problems (1.6%) or arrears (2.1%), being in low income and having recently entered low income (1.6%), and having left employment since the previous year (1.3%).

Table 3 summarises the relationship between financial hardship and unsustainable housing commitments. It shows, for example, that fewer than 3% of households that were able to afford to keep their home adequately warm, an annual holiday, replace broken furniture, buy new clothes, eat meat on alternate days, and feed visitors once a month had housing payment problems. This proportion increased dramatically, such that 15% of households that could not afford two of these items, and one third of households unable to afford five or all six of the items were in payment problems. A similar relationship emerges with the other indicators of unsustainable housing commitments – households that were in financial hardship were more at threat of losing their home.

These tables indicate that unsustainable housing commitments are highly correlated with financial disadvantage and a range of negative shocks, both financial and labour market related. Such shocks are also likely to affect an individual's psychological well-being, and need to be taken into account when isolating the impact of (the threat of) home loss on mental health. To investigate these relationships in detail, Table 4 summarises GHQ12 scores at the date of interview prior to an event (t-1), the date of interview after an event (t), and the change in GHQ12 scores between these two dates of interview. These summary statistics indicate that the mean GHQ12 score was 11.1. Heads of households in low income reported significantly higher than average GHQ12 scores at both t-1 and t, by almost 2 points, indicating a significant psychological cost to being in low income. Household heads who were unable to save regularly were also in significantly worse psychological health than average, but by a smaller amount. We find that those in housing payment problems or in arrears had GHQ12 scores some 2.5 points higher than average, initial evidence of a significant and substantial psychological cost to unsustainable housing commitments among heads of households. As a comparison, we summarise GHQ12 scores of the unemployed and not working. These indicate that the non-working at t have similar levels of psychological health to those in housing payment problems, and that the unemployed in particular experienced a significant decline in their well-being between t-1 and t.

The next eight rows of the table examine the impacts on mental well-being of experiencing negative financial shocks between t-1 and t, such as transitions into low income, stopping to

save regularly, entering payment problems, entering arrears and, as a comparison, entering unemployment, leaving work and marital separation. (We define marital separation to include divorce, separation and the death of a partner. There are too few observations to disaggregate this further). These suggest two things. Firstly individuals who experienced negative financial shocks already had significantly higher GHQ12 scores than average prior to the event (the exception is those who stopped saving). Estimation procedures that do not allow for this will therefore result in biased coefficients on the variables of interest. Secondly the table shows that there are substantial psychological costs involved with all of the events. In particular, average GHQ12 scores increased significantly for heads of households who entered payment problems, from 12.8 at $t-1$ to 13.4 at t . A similar increase is associated with entering arrears, from 13.5 to 14.1. The mean GHQ12 score at t of heads of household who had entered arrears since $t-1$ was 3.1 points above average, strong evidence supporting our hypothesis of psychological costs associated with arrears. As a comparison leaving work and marital dissolution are associated with an increase in GHQ12 scores of about 1 point.

The next six rows focus on the impact of positive financial shocks, i.e. of transitions out of housing payment problems, out of arrears, out of low income, into saving, entering work and leaving unemployment. If our hypothesis is correct, transitions out of unsustainable housing commitments should be associated with an improvement in psychological health (a fall in GHQ12 scores). The raw data support this. Men who moved out of housing payment problems experienced a significant decline in their GHQ12 scores, from 12.8 to 12.0, while the GHQ12 score of those who moved out of arrears fell significantly from 14.0 to 13.0. These improvements in psychological health are similar in magnitude to those associated with leaving low income, but are considerably smaller in magnitude to those experienced by household heads who left unemployment or who entered work. Such heads of households experienced a fall in GHQ12 scores of about 2 points.

The final row considers the correlations between imminent home loss (eviction or repossession) and GHQ12 scores. This indicates that households that suffered an eviction or repossession in the subsequent 12 months (t to $t+1$) had significantly higher GHQ12 scores than average at both $t-1$ and t , but there was little change between the two dates of interview. This might indicate that

despite the correlation between eviction and repossession and other financial disadvantage highlighted in Table 2, for many eviction is the result of a sudden and catastrophic financial collapse. We examine this in Table 5. This table indicates that household heads who suffered eviction and who had either payment problems or arrears beforehand had higher GHQ12 scores than those who did not and that this difference widened as the eviction approached. This suggests that a lengthy period of unsustainable housing costs with the associated threat of home loss has serious psychological costs.

Therefore the raw data indicate strong relationships between unsustainable housing commitments and negative financial shocks, and between these events and psychological well-being. We now turn to multivariate analysis to control for these confounding factors and to isolate the psychological costs associated with the threat of home loss.

4. Framework, methods and model specification

Our estimation framework and econometric specification are based on the logical sequence of events suggested by the data described in the previous section. In particular, (heads of) households experience a negative financial shock that affects both their propensity to have unsustainable housing commitments and their psychological well-being. Furthermore entering unsustainable housing commitments itself, and the associated threat of home loss, has a separate impact on psychological health over and above the impact of the negative financial shock. To investigate this requires estimating models that control for both the households' general financial situation and the negative shock, as well as having unsustainable housing commitments.

We do this by approximating the 36 point GHQ12 score to be linear, and specifying the following:

$$GHQ_{it} = X'_{it}\beta_1 + \beta_2 Y_{it} + \beta_3 S_{it} + \beta_4 U_{it} + \alpha_i + v_{it}$$

where $i=1,\dots,n$, $t=1,\dots,T$, X_{it} is a vector of (strictly exogenous) observable individual, household and job-related characteristics that are assumed to affect GHQ scores. Y_{it} is household income in the month prior to interview, S_{it} identifies whether or not the household

received a negative financial shock since the previous date of interview, while U_{it} identifies whether or not the household has unsustainable housing commitments of varying degrees of severity (housing payment problems, arrears, imminent eviction or repossession). The α_i captures individual-specific time-invariant unobserved characteristics that affect a person's psychological health while ν_{it} is random error. The β s are (vectors of) coefficients to be estimated. We take advantage of the longitudinal nature of the data to control for time-invariant individual-specific unobserved characteristics by using within-group estimation in which variables are defined as deviations from their individual means. This is important as our descriptive statistics indicate that individuals who experience negative financial shocks and who enter unsustainable housing commitments have higher GHQ12 scores than average even before the event. Therefore OLS estimates would be positively biased.³ Our estimated specification can be written:

$$GHQ_{it} - \overline{GHQ}_i = b_1(X_{it} - \overline{X}_i) + b_2(Y_{it} - \overline{Y}_i) + b_3(S_{it} - \overline{S}_i) + b_4(U_{it} - \overline{U}_{it}) + (v_{it} - \bar{v}_i)$$

Therefore we estimate whether unsustainable housing commitments results in heads of households having poorer psychological health *than usual*, controlling for household income, the proximity and nature of negative shocks and other observable characteristics. This procedure removes the person-specific fixed effects and time-invariant individual and household characteristics.⁴

Our empirical models control for factors that are important determinants of psychological health. These are likely to be wide-ranging and compounding as housing payment problems are unlikely to be an isolated life event (Nettleton and Burrows 1998). We include both household income in the month prior to interview (in log form) and also a variable indicating whether or not the household is in the bottom quartile of the equivalent household income distribution in the relevant year.⁵ To measure the severity of financial hardship, we include the number of items

³ F-tests for the impact of individual effects are consistently statistically significant, rejecting OLS specifications.

⁴ Hausman tests rejected random effects models in favour of the within-group fixed effects specifications.

⁵ We use the log of household income to be consistent with previous studies (Ettner 1996; Ecob and Davey Smith 1999; Wildman and Jones 2002; Wildman 2003). Wildman (2003) also examines the separate impacts of income levels and being in low income, and finds being in low income to be a more important determinant of psychological well-being, all else equal. Wildman (2003) examined the impact of individuals' subjective evaluation of their own financial situation on mental health, and found a strong correlation between reporting a financial deterioration and GHQ12 scores. We omit such subjective evaluations because of potential endogeneity – individuals who lose sleep

from the following list that the household are unable to afford: keep their home adequately warm, an annual holiday, to replace worn out furniture, to buy new clothes, to eat meat on alternate days and to feed visitors at least once a month. We also include a variable indicating whether or not the head of household is unable to save from their current income (although this may reflect inter-temporal consumption preferences as much as financial hardship). To distinguish between the immediate psychological cost of financial hardship and the longer-term effects, we also include variables indicating whether the head of household entered low income since last year and whether they have stopped saving since last year. We also control for household wealth by including self-assessed house value for home-owners (Lea et al 1993). By including this together with the size of the original mortgage on the property we allow housing equity to influence psychological health. These take the value zero for household heads in rented accommodation.

Studies have illustrated the impact of unemployment on mental well-being (Clark & Oswald 1994; Kisely and Goldberg 1997; Clark 2003; Wildman 2003; Hauck and Rice 2004), and so we include indicators of current labour market status (not currently in work, in self-employment, in part-time employment, with full-time employment as the reference category). We also include a variable indicating whether or not the head of household had lost their job since last year to distinguish between the immediate and long-term psychological cost associated with being jobless. Duration in current labour market status may also be correlated with housing payment difficulties, with the long-term unemployed in particular having problems. We therefore include variables measuring elapsed duration in the current labour market state. For those in employment, we include measures of their occupation and their working hours (which take the value zero for those not employed).

Other covariates include factors that affect household expenditure patterns, housing preferences and psychological health such as marital status (Reissman and Gerstal 1985; Richards et al 1997; Pevalin & Goldberg 2003; Wildman 2003; Wade & Pevalin 2004), and the age and number of children in the household (Michelson 1976; Lea et al 1993). Given the well

over worry or who are unable to face up to problems (used to measure GHQ12 scores) may also be more likely to report that their financial situation has worsened or take a pessimistic view of their finances.

documented relationships between housing and mental health, we also include variables that measure housing tenure, housing type (detached, semi-detached, terraced, flat) and quality – the latter include the ratio of household size to the number of rooms in the house and the number of problems from which the accommodation suffers (Fanning 1967; Cappon 1971; Gillis 1977; Edwards et al 1982; Lea et al 1993; Ross & Mirowsky 2001; Pevalin et al 2005).⁶ The psychological impact of payment arrears or eviction/repossession may be dampened if many households are suffering the same fate, and we include as additional covariates the aggregate number of households in England and Wales in each calendar year that were more than 6 months in arrears, and that were repossessed. These are available from the website of the Office of the Deputy Prime Minister (ODPM 2005). Other covariates include whether or not the spouse of the head of household is in employment (if married or cohabiting), region of residence and month and year dummies. We distinguish between male and female heads of households throughout because of differences in household structures, labour supply, housing preferences and well-reported gender differences in the determinants of and impact of housing on psychological health (Gillis 1977; Edwards et al 1982; Arber 1991; Joung et al 1997; Picinelli & Wilkinson 2000; Wildman 2003; Hauck & Rice 2004). Although we anticipate an association between mental and physical health (Nettleton & Burrows 1998; Pevalin & Goldberg 2003), we do not include measures of physical health because of potential endogeneity.

5. Empirical results

We present results from the multivariate analysis in Tables 6, 7 and 8. Tables 6 and 7 show the coefficient estimates on the variables of interest for male and female heads of households respectively. Table 8 compares the results for homeowners and tenants, to examine whether unsustainable housing commitments affect homeowners more than tenants. We estimate five specifications. Specification [1] presents the estimates from models with the unsustainable housing commitment variables but without any other controls to examine the impact of housing payment problems in the raw data. Specification [2] introduces the full range of covariates to control for the impacts of income, negative financial shocks and household and demographic

⁶ The list of potential problems is: shortage of space, noise from neighbours, street noise, not enough light, lack of adequate heating, condensation, leaky roof, damp walls/floor etc, rot in windows/floors, pollution/environmental

characteristics. Specification [3] distinguishes between recent entrants into unsustainable housing commitment and those who were in longer-term difficulties. Specification [4] includes a variable indicating whether or not the heads of households were evicted or repossessed in the following year (t to $t+1$), to assess whether the imminent threat of home loss affects current psychological well-being.⁷ The final specification distinguishes heads of households that were subsequently evicted and who had had persistent problems meeting housing costs from those that were evicted due to catastrophic financial collapse. We present only the coefficients on the main variables of interest, with coefficients on other control variables available in Appendix B.

5.1 Male heads of households

Initially we focus on the results for men (Table 6). Specification [1] indicates that being in payment problems increases GHQ12 scores by 1.25 points at the sample means. Being in arrears increases GHQ12 scores by an additional 0.7 points. Therefore a man in payment arrears has a GHQ12 score 1.9 points higher than a man with no housing payment problems. Specification [2] introduces the full range of control variables. These indicate that being in the bottom quartile of the household income distribution, not saving and being in financial hardship are associated with having lower levels of mental health, all else equal. However, entering low income or stopping saving since the last year have no additional impact. Income levels do not have any additional impact on GHQ12 scores (see also Wildman and Jones 2002; Wildman 2003). Men who are not in full-time work experience an increase in the GHQ12 score of 1.6 points at the sample means. This effect increases to $1.627+0.702=2.329$ if they lost their job since the previous date of interview. Therefore there is a large immediate impact of job loss on psychological well-being that persists over time. Marital dissolution also worsens mental well-being by 1.2 GHQ points. However the addition of these controls has little impact on the size and significance of the unsustainable housing commitment indicators. At the sample means, having problems meeting housing costs increases GHQ12 scores by 1.2 points, while being in

problems, vandalism/crime. This information is only available from 1996 onwards, so the number of housing problems takes the value zero for earlier years and year dummies are included.

⁷ We have also experimented with other specifications including interactions between unsustainable housing commitments and the number of children, and between unsustainable housing commitments and household income. Results indicate that the psychological costs of housing payment problems and arrears are larger for male heads of households with children, although the sizes of these effects are relatively small. No differences by income were found.

arrears increases GHQ12 scores by an additional 0.6. The sizes of these effects are similar in magnitude to marital dissolution and being out of work. The psychological cost of housing payment problems and arrears is similar to that from marital dissolution and unemployment.⁸

But what are the impacts of long term housing payment problems relative to recent entry into housing payment problems? Specification [3] looks at this issue. The results indicate that recent entry into housing payment problems has no additional psychological impact – the coefficient on entering payment problems since last year is small and poorly determined. However the additional psychological impact of being in payment arrears is more immediate. Recent entry into arrears increases GHQ12 scores by 1 point at the sample means, while persistent arrears have no additional impact on psychological health than housing payment problems. The sizes of the coefficients imply that male heads of households that entered arrears since the previous year suffer an increase in their GHQ12 scores of $1.259 + 0.113 - 0.014 + 1.002 = 2.36$ relative to having no housing payment problems. This differential falls to $1.259 + 0.113 = 1.372$ in the subsequent year.

Specification [4] adds the variable indicating whether or not the head of household was evicted or repossessed in the 12 months following the current date of interview, to examine whether the imminent expectation of home loss has psychological costs. The coefficient on this variable is positive, relatively large, and statistically significant at the 10% level – home loss in the following year increases current GHQ12 scores by 0.7 points. Hence the real threat of home loss reduces psychological health, all else equal. The final specification distinguishes between those that were subsequently evicted but that had no payment problems at time t from those that were evicted and that had suffered more persistent payment problems. The estimates suggest that those in payment problems that were subsequently evicted had GHQ12 scores that were $1.222 + 1.506 = 2.728$ points higher than if not in problems, and 1.506 points higher than if in payment problems but not subsequently evicted.

⁸ Furthermore, the coefficients on the other covariates (shown in Appendix B) indicate that the only other events that have similarly large negative impacts on psychological health are being a local authority or private tenant.

Therefore for male heads of households we find that persistent housing payment problems and entering arrears have significant psychological costs. The sizes of these effects are similar in magnitude to those associated with unemployment or marital dissolution. We also find evidence that the imminent threat of home loss has an additional negative impact on psychological health.

5.2 Female heads of households

Table 7 presents the coefficient estimates for female heads of households. Specification [1] shows that female heads of households suffer a psychological cost to having housing payment problems. Such problems increase GHQ12 scores by 0.6 points. However, being in payment arrears has no additional impact on mental well-being – the coefficient is small and poorly determined. In specification [2] we introduce the full range of explanatory variables. The estimates indicate that the impact of being in housing payment problems is robust to the inclusion of these variables, again increasing GHQ12 scores by 0.6 points. This is comparable to the impact of being in the bottom quartile of the household income distribution. Again, being in arrears has no additional impact. Coefficients on the other variables indicate that, as for men, female heads of households in low income or who were not saving regularly suffered lower levels of mental health, indicating the psychological costs of low income. Furthermore, each additional item that the household could not afford increases GHQ12 scores by 0.24 points. Income level has no additional impact. The estimates also indicate that it is a persistent lack of saving that contributes to reducing mental health. Stopping saving since the previous year has little impact on psychological health ($0.642 - 0.550 = 0.092$) but a more persistent lack of saving increases GHQ12 scores by 0.642 points. Persistent non-employment and marital dissolution have similar sized impacts.

Specification [3] distinguishes between the immediate impact of falling into unsustainable housing commitments and the impact of more persistent difficulties. The estimates indicate that it is persistent difficulties meeting housing payments that incur psychological costs. Recent entry into payment problems increases GHQ12 scores by $0.717 - 0.264 = 0.453$ points, while more persistent problems increase scores by 0.717 points. Similarly, falling into arrears has little additional impact on GHQ12 scores over and above the increase of 1.319 points associated with more persistent arrears.

Specification [4] adds the variable indicating whether or not the household suffered eviction or repossession within the following 12 months. The coefficient on this variable is large and positive indicating that the threat of home loss increases GHQ12 scores by 0.9 points. However, this is not well determined. The final specification indicates that, as for men, female heads of households in payment difficulties and that were subsequently evicted suffered greater mental distress than other household heads with or without payment difficulties. Although large and positive, however, the coefficient is not statistically significant.

Therefore for female heads of households we find that persistent housing payment problems and arrears have significant psychological costs. The sizes of these effects are in addition to, and larger in magnitude than, those associated with financial hardship more generally.

Home owners and tenants

Table 8 presents the results from estimating the models separately for home-owners and tenants, to test the hypothesis that the threat of home loss has a larger impact for home-owners (who make a large financial and emotional investment in their home) than for tenants. Sample sizes are insufficient to allow separate estimation by gender, and so we pool male and female heads of households into a single sample.

The results indicate a number of differences between the two groups. For example, the psychological costs of financial hardship (measured in terms of unaffordable items) are larger among tenants than home-owners, all else equal. Each additional item that cannot be afforded increases GHQ12 scores by 0.3 points among tenants, but by only 0.09 points among homeowners. Tenants and homeowners suffer psychological costs from recent job loss, increasing their GHQ12 scores by 2 points (0.3+1.7 for homeowners, 0.8+1.2 for tenants). However, our main interest lies in the difference between homeowners and tenants in the impact of unsustainable housing costs. The coefficients on these terms indicate that being in housing payment problems has a similar impact on the two groups, increasing GHQ12 scores by approximately 1 point. This effect is similar in size to that associated with being widowed, divorced or separated. However, there is a large, and statistically significant, difference between

homeowners and tenants in the impact of being in arrears. Among homeowners, heads of households that were in arrears had a GHQ12 score 1.4 points higher than if having payment problems, and $1.05+1.39=2.44$ points higher than a head of household with no housing payment problems. However, among tenants, being in rent arrears *reduces* GHQ12 scores relative to those in housing payment problems, although the coefficient is not well-determined. Hence arrears have a significantly greater (negative) impact on psychological well-being among homeowners than tenants, supporting our hypothesis. The estimates indicate that imminent eviction or repossession has a large impact on psychological health among tenants, increasing GHQ12 scores by 0.8 points. Among homeowners, the impact is smaller and poorly determined (but also not significantly different than that among tenants).

6. Summary and conclusions

In this paper, we have used panel data to identify the psychological costs of unsustainable housing commitments over and above the impact of financial hardship more generally, compare them with the costs associated with other disruptive events such as the loss of a partner or job loss, and examine whether they differ between tenants and homeowners. Although the number of households in Britain experiencing repossession and arrears has fallen over the last decade, evictions have remained relatively stable. In 2003 almost 200,000 households either lost their homes or were more than 6 months in arrears with their housing payments and heads of households are more likely to have difficulties meeting their housing costs than to be unemployed.

The starting point of our empirical analysis is the hypothesis that unsustainable housing commitments and the threat of home loss adversely affect the head of household's psychological health in addition to the associated financial hardship. Furthermore, we anticipate that these psychological costs are larger for homeowners than tenants. Homeowners have made large financial, emotional and psychological investments into their home, while tenants tend to be more geographically mobile and less attached to their place of residence. We focus on heads of households, as they are primarily responsible for meeting housing costs and for the financial well-being of their household.

For male heads of households, we find that arrears and housing payment problems incur significant psychological costs, even controlling for financial hardship and negative financial shocks, individual and household characteristics and time-invariant unobserved heterogeneity. These costs are larger for arrears than for payment problems, and are equivalent in size to those associated with unemployment or marital dissolution. Imminent eviction or repossession is also associated with a decrease in mental well-being, particularly if it is the result of persistent payment problems. For female heads of households, it is persistent exposure to unsustainable housing commitments that incur psychological costs. Furthermore, the psychological costs of being in arrears are significantly larger among homeowners than tenant, supporting our hypotheses. Such costs need to be incorporated when assessing the impact of housing market recessions in order accurately reflect their true welfare consequences for households.

References

- Arber, S. (1991). Class, paid employment and family roles: Making sense of structural disadvantage, gender and health status. *Social Science and Medicine*, 32, 425-436.
- Argyle, M. (1989). *The psychology of happiness*. London: Routledge.
- Böheim, R. & Taylor, M.P. (2000). My home was my castle: Evictions and repossessions in Britain. *Journal of Housing Economics*, 9, 287-319.
- Böheim, R. & Taylor, M.P. (2002). Tied down or room to move? Investigating the relationships between housing tenure, employment status and residential mobility in Britain. *Scottish Journal of Political Economy*, 49 (4), 369-392.
- Brookes, M., Dicks, M. & Pradhan, M. (1994). An empirical model of mortgage arrears and repossessions. *Economic Modelling*, 11, 134-144.
- Brown, S., Taylor, K. & Wheatley Price, S. (2005). Debt and distress: Evaluating the psychological cost of credit. *Journal of Economic Psychology*, forthcoming.
- Cappon, D. (1971). Mental health in the high rise. *Canadian Journal of Public Health*, 62, 426-431.
- Clark, A.E. (2003). Unemployment as a social norm: Psychological evidence from panel data. *Journal of Labor Economics*, 21, 323-351.
- Clark, A.E. & Oswald, A.J. (1994). Unhappiness and unemployment, *Economic Journal*, 104, 648-659.
- Davis, R. & Dhooge, Y. (1992). *Living with mortgage arrears*. London: HMSO.
- De Neve, K.M. & Cooper, H. (1999). The happy personality: A meta analysis of 137 personality traits of subjective well-being. *Psychological Bulletin*, 125, 197-229.
- Doling, J., Ford, J., & Stafford, B. (1988). *The property owning democracy*. Aldershot: Avebury.
- Ecob, R. & Davey Smith, G. (1999). Income and health: What is the nature of the relationship. *Social Science and Medicine*, 48, 693-705.
- Edwards, J.N., Booth, A., & Edwards P.K. (1982). Housing type, stress and family relations. *Social Forces*, 61, 241-257.
- Ellenberger, H. (1971). Behavior under involuntary confinement. In Esser, A.H. (ed). *Behaviour and Environment*. New York: Plenum Press.
- Ettner, S.L. (1996). New evidence on the relationship between income and health. *Journal of Health Economics*, 15, 67-85.
- Fanning, D.M. (1967). Families in flats. *British Medical Journal*, 18, 382-386.
- Foley, D.L. (1980). The sociology of housing. *Review of Sociology*, 6, 457-478.
- Ford, J. (1993). Mortgage possession. *Housing Studies*, 8, 227-240.
- Ford, J. & Burrows, R. (1999). The costs of unsustainable home ownership in Britain. *Journal of Social Policy*, 28, 305-330.
- Ford, J., Kempson, E. & Wilson, M. (1995). *Mortgage arrears and possessions: Perspectives from borrowers, lenders and the courts*. London: HMSO.
- Ford J. & Wilcox, S. (1998). Owner occupation, employment and welfare: The impact of changing relationships on sustainable home ownership. *Housing Studies*, 13, 623-638.
- Foster, C. & Van Order, R. (1984). An option-based model of mortgage default. *Housing Finance Review*, 3, 351-372.
- Fried, M. (1963). Grieving for a lost home. In Duhl, L.J. (ed). *The urban condition*. New York: Simon and Schuster.

- Gillis, A.R. (1977). High rise housing and psychological strain. *Journal of Health and Social Behaviour*, 18, 418-431.
- Goldberg, D. (1972). *The detection of psychiatric illness by questionnaire*. Oxford: Oxford University Press.
- Goldberg, D. (1978). *Manual of the General Health Questionnaire*. Windsor: NFER.
- Hahn, B.A. (1993). Marital status and women's health: The effect of economic marital acquisitions. *Journal of Marriage and the Family*, 55, 494-505.
- Hauck, K. & Rice, N. (2004). A longitudinal analysis of mental health mobility in Britain. *Health Economics*, 13, 981-1001.
- Juonng, I.M.A., Stronks, K., van de Mheen, H., van Poppel, F.W.A., van der Meer, J.B.W., & Mackenbach, J.P. (1997). The contribution of intermediary factors to marital status differences in self-reported mental health. *Journal of Marriage and the Family*, 59, 476-490.
- Kau, J.B. & Keenan D.C. (1999). Patterns of rational mortgage default. *Regional Science and Urban Economics*, 29, 765-785.
- Kau, J.B., Keenan, D.C., Miller III, W.J. & Epperson J.F. (1995). The valuation at origination of fixed-rate mortgages with default and prepayment. *Journal of Real Estate Finance and Economics*, 11, 5-36.
- Kisely, S.R. & Goldberg, D.P. (1997). The effect of physical ill health on the course of psychiatric disorder in general practice. *British Journal of Psychiatry*, 170, 536-540.
- Lambrecht, B., Perrandin, W. & Satchell, S. (1997). Time to default in the UK mortgage market. *Economic Modelling*, 14, 485-499.
- Lea, S.E.G., Webley, P. & Levine, R.M. (1993). The economic psychology of consumer debt. *Journal of Economic Psychology*, 14, 85-119.
- MacLennan, D. (1997). The UK housing market: Up, down and where next?, in Williams, P. (ed.), *Directions in Housing Policy: Towards Sustainable Housing Policies for the UK*. London: Paul Chapman.
- Malpass, P. & Murie, A. (1999). *Housing Policy and Practice*, 5th Edition. Macmillan: London.
- Marmot, M., Ryff, C., Bumpass, L., Shipley, M. & Marks, N. (1997). Social inequalities in health: Next questions and converging evidence. *Social Science and Medicine*, 44, 901-910.
- McCabe, C.J., Thomas, K.J., Brazier, J.E. & Coleman, P. (1996). Measuring the mental health status of a population: A comparison of the GHQ-12 and the SF-36. *British Journal of Psychiatry*, 169, 516-521.
- McCulloch, A. (2001). Psychiatric morbidity and nonignorable attrition from the British Household Panel Survey. *Institute for Social and Economic Research, University of Essex*.
- Michelson, W. (1976). *Man and his urban environment: A sociological approach*. Reading MA: Addison-Wesley.
- Nettleton, S. & Burrows, R. (1998). Mortgage debt, insecure home ownership and health: An exploratory analysis. *Sociology of Health and Illness*, 20, 731-753.
- The Office of the Deputy Prime Minister (2005). Table 546: Housing market: reposessions, court actions for recovery of residential housing and land, England and Wales from 1989. (<http://www.odpm.gov.uk>)
- Pevalin, D.J. (2000). Multiple applications of the GHQ-12 in a general population sample: an investigation of long-term retest effects. *Social Psychiatry and Psychiatric Epidemiology*, 35, 508-512.
- Pevalin, D.J. & Goldberg, D.P. (2003). Social precursors to onset and recovery from episodes of common mental illness. *Psychological Medicine*, 33, 299-305.

- Pevalin, D.J., Taylor, M.P. & Todd, J. (2005). The relationship between changes in housing quality and health dynamics, *mimeo*, University of Essex.
- Piccinelli, M. & Wilkinson, G. (2000). Gender differences in depression. *British Journal of Psychiatry*, 177, 486-492.
- Porteous, J.D. (1976). Home: The territorial core. *Geographical Review*, 66, 383-390.
- Reissman, C.K. & Gerstal, N. (1985). Marital dissolution and health: Do males or females have greater risk? *Social Science and Medicine*, 20, 627-635.
- Richards, M., Hardy, R. & Wadsworth M. (1997). The effects of divorce and separation on mental health in a national UK birth cohort. *Psychological Medicine*, 27, 1121-1128.
- Roberts, R., Golding, J. & Towell, T. (1998). Student finance and mental health. *The Psychologist*, October, 489-491.
- Ross, C.E. & Mirowsky, J. (2001). Neighborhood disadvantage, disorder and health. *Journal of Health and Social Behaviour*, 42, 258-276.
- Stradling, S. (2001). The psychological cost of student debt. In Scott, A., Lewis, A. & Lea, S. (eds) *Student debt: The causes and consequences of undergraduate borrowing in the UK*. Bristol: The Policy Press.
- Wade, T.J. & Pevalin, D.J. (2004). Marital transitions and mental health. *Journal of Health and Social Behavior*, 42, 155-170.
- Webley, P. & Nyhus, E.K. (2001). Lifecycle and dispositional routes into problem debt. *British Journal of Psychology*, 92, 423-446.
- Weich, S. & Lewis, G. (1998). Poverty, unemployment and common mental disorders: Population based cohort study. *British Medical Journal*, 314, 591-595.
- Wildman, J. & Jones, A.M. (2002). Is it absolute income or relative deprivation that leads to poor mental health? A test based on individual-level longitudinal data. *Mimeo*. University of Newcastle.
- Wildman, J. (2003). Income related inequalities in mental health in Great Britain: Analysing the causes of health inequality over time. *Journal of Health Economics*, 23, 295-312.
- Wilkinson, R. (1996), *Unhealthy societies: The afflictions of inequality*. London: Routledge.

Table 1: Incidence of unsustainable housing and unemployment

Year	Payment problems at t	Arrears at t	Evicted/ Possessed t to t+1	Unemployed at t
1991	17.6	5.0	0.7	7.0
1992	16.5	4.4	0.9	6.4
1993	14.6	4.1	0.9	6.4
1994	12.8	3.5	1.0	5.5
1995	10.4	2.3	0.7	4.2
1996	8.3	1.6	1.2	4.8
1997	9.4	1.9	0.6	3.1
1998	8.8	1.3	0.6	2.9
1999	8.6	1.7	0.9	3.1
2000	9.5	2.2	0.8	2.9
2001	6.7	1.8	0.6	1.7
2002	6.1	1.3	0.6	2.7

Notes: BHPS 1991-2003. Heads of households only. Weighted using cross-sectional weights.

Table 2: Relationships between unsustainable housing and life events

Life event	Payment problems t	Arrears t	Eviction/possession t to t+1
All	9.3	2.1	0.6
Payment problems t-1	43.6	13.0	1.1
Payment problems t	--	22.7	1.6
Arrears t-1	54.3	31.0	1.2
Arrears t	100.0	--	2.1
Low income t-1	16.4	5.2	1.5
Low income t	16.5	5.0	1.5
Entered low income t-1/t	18.8	5.5	1.6
Do not save t-1	13.5	3.3	0.7
Do not save t	14.1	3.4	0.7
Stopped saving t-1/t	8.9	1.4	0.4
Not working t-1	15.2	4.4	1.1
Not working t	14.5	4.2	1.0
Lost job t-1/t	19.6	6.5	1.3
N	2631	621	163

Notes: BHPS 1991-2003. Heads of households only. Weighted using cross-sectional weights.

Table 3: Incidence of unsustainable housing by the number of items household unable to afford

Number not afforded t	Payment problems t	Arrears t	Eviction/possession t to t+1
0	2.7	0.4	0.3
1	7.7	0.9	0.4
2	14.9	3.1	1.3
3	21.2	5.1	1.2
4	25.0	8.4	1.7
5 or 6	33.7	8.7	0.3
N	1531	327	120

Notes: BHPS 1996-2003. Heads of households only. Weighted using cross-sectional weights. Unaffordable items include keep home adequately warm, an annual holiday, replace broken furniture, buy new clothes, eat meat on alternate days, feed visitors once a month.

Table 4: Average GHQ12 scores

Event	Mean GHQ12 Scores			
	t-1	t	Change	N
All	11.08	11.07	-0.01	26833
Low income at t	13.00 ^ψ	13.01 ^ψ	0.02	3844
Do not save at t	11.69 ^ψ	11.70 ^ψ	0.01	15115
Housing payment problems at t	13.55 ^ψ	13.58 ^ψ	0.03	2631
Arrears at t	13.64 ^ψ	13.94 ^ψ	0.30	621
Unemployed at t	12.91 ^ψ	13.21 ^{ψ*}	0.29†	993
Not working at t	13.53 ^ψ	13.47 ^ψ	-0.06	5236
Entered low income t-1 to t	12.63 ^ψ	12.92 ^{ψ*}	0.30†	1370
Stopped saving t-1 to t	10.63 ^ψ	10.90 ^{ψ*}	0.27†	3149
Entered payment problems t-1 to t	12.75 ^ψ	13.38 ^{ψ*}	0.62†	1342
Entered arrears t-1 to t	13.48 ^ψ	14.11 ^{ψ*}	0.63†	388
Entered unemployment t-1 to t	13.28 ^ψ	13.82 ^{ψ*}	0.54†	585
Stopped working t-1 to t	12.78 ^ψ	13.68 ^{ψ*}	0.90†	928
Marriage dissolved t-1 to t	12.61 ^ψ	13.80 ^{ψ*}	1.19†	271
Left low income t-1 to t	13.16 ^ψ	12.03 ^{ψ*}	-1.13†	1408
Started saving t-1 to t	10.91 ^ψ	10.39 ^{ψ*}	-0.52†	3240
Left payment problems t-1 to t	12.81 ^ψ	11.98 ^{ψ*}	-0.83†	1641
Left arrears t-1 to t	13.99 ^ψ	12.96 ^{ψ*}	-1.02†	491
Entered work t-1 to t	13.07 ^ψ	10.88 ^{ψ*}	-2.18†	955
Left unemployment t-1 to t	13.98 ^ψ	11.76 ^{ψ*}	-2.22†	713
Evicted or reposessed t to t+1	11.99 ^ψ	12.09 ^ψ	0.10	163

Notes: BHPS 1991-2003. Heads of households only. Weighted using cross-sectional weights.

^ψ indicates GHQ12 score significantly different from the gender-specific average at the 5% level.

* indicates GHQ12 score at t significantly different from that at t-1 at 5% confidence level.

† indicates change in GHQ12 score between t-1 and t significantly different from the gender-specific average at the 5% confidence level.

Table 5: Average GHQ12 scores by eviction/repossession

Event	Mean GHQ12 Scores			N
	t-1	t	Change	
All evicted/repossessed t to t+1	11.99	12.09	0.10	163
Evicted/repossessed t to t+1 and had payment problems at t	12.47	14.90*‡	2.43†	43
Evicted/repossessed t to t+1 and no payment problems at t	11.81	11.09	-0.73	120

Notes: BHPS 1991-2003. Heads of households only. Weighted using cross-sectional weights.

* indicates GHQ12 score at t significantly different from that at t-1 at 5% confidence level.

‡ indicates GHQ12 score significantly different from the average for all evicted/repossessed t to t+1 at the 5% level.

† indicates change in GHQ12 score between t-1 and t significantly different from the average at the 5% confidence level.

Table 6: Determinants of mental well-being, male heads of households: BHPS 1991-2003

	Spec [1]	Spec [2]	Spec [3]	Spec [4]	Spec [5]
<i>Indicators of unsustainable housing commitment</i>					
In housing payment problems	1.247*** [10.74]	1.248*** [10.70]	1.259*** [8.12]	1.243*** [10.65]	1.222*** [10.43]
In arrears	0.706*** [3.17]	0.629*** [2.84]	0.113 [0.37]	0.624*** [2.82]	0.618*** [2.79]
Entered housing payment problems since last year			-0.014 [0.07]		
Entered arrears since last year			1.002*** [2.61]		
Evicted/repossessed t to t+1				0.682* [1.95]	0.273 [0.67]
Evicted/repossessed t to t+1 and in problems at t					1.506** [1.97]
<i>Indicators of financial situation</i>					
Log household income		-0.007 [0.13]	-0.008 [0.14]	-0.006 [0.10]	-0.005 [0.09]
In bottom quintile of equiv h'hold income distribn		0.331* [1.92]	0.335* [1.94]	0.327* [1.89]	0.322* [1.86]
Not currently saving regularly		0.378*** [4.76]	0.382*** [4.80]	0.379*** [4.77]	0.378*** [4.76]
Number of unaffordable items		0.168*** [4.14]	0.166*** [4.10]	0.167*** [4.12]	0.166*** [4.09]
<i>Indicators of recent negative shock</i>					
Entered low income since last year		-0.022 [0.11]	-0.034 [0.17]	-0.020 [0.10]	-0.015 [0.07]
Stopped saving since last year		0.007 [0.07]	0.003 [0.03]	0.007 [0.07]	0.007 [0.07]
Lost job since last year		0.702*** [3.24]	0.674*** [3.11]	0.702*** [3.24]	0.699*** [3.23]
<i>Other variables of interest</i>					
Not employed		1.627*** [6.21]	1.628*** [6.22]	1.624*** [6.20]	1.623*** [6.20]
Widowed/divorced		1.186*** [3.99]	1.182*** [3.98]	1.186*** [3.99]	1.181*** [3.98]
R ²	0.008	0.031	0.031	0.031	0.031
N individuals			5651		
N person-years			26618		

Notes: Within group estimation results. Absolute robust t-statistics in brackets. Dependent variable is 36-point GHQ12 score. Specifications [2] – [5] also include two labour market status dummies (part-time employed, self-employed), tenure in current status by current status, usual weekly hours of work (if working), spouse's employment status, region, housing tenure, housing type (detached, semidetached, terraced, flat), marital status, number and ages of children, occupation if employed, log house value, log of size of mortgage, persons per room, number of housing problems, year dummies, number of households in arrears, number of households suffering repossession, all measured at t.

***, **, * indicate statistical significance at the 1%, 5% and 10% confidence level respectively.

Table 7: Determinants of mental well-being, female heads of households: BHPS 1991-2003

	Spec [1]	Spec [2]	Spec [3]	Spec [4]	Spec [5]
<i>Indicators of unsustainable housing commitment</i>					
In housing payment problems	0.619*** [2.79]	0.572** [2.56]	0.717** [2.59]	0.569** [2.55]	0.541** [2.40]
In arrears	0.080 [0.21]	0.209 [0.55]	1.319** [2.56]	0.209 [0.55]	0.211 [0.55]
Entered housing payment problems since last year			-0.264 [0.73]		
Entered arrears since last year			-2.183*** [3.29]		
Evicted/repossessed t to t+1				0.921 [1.55]	0.627 [0.96]
Evicted/repossessed t to t+1 and in problems at t					1.441 [1.07]
<i>Indicators of financial situation</i>					
Log household income		0.030 [0.25]	0.035 [0.29]	0.032 [0.27]	0.032 [0.27]
In bottom quintile of equiv h'hold income distribn		0.556** [2.18]	0.572** [2.25]	0.557** [2.19]	0.553** [2.17]
Not currently saving regularly		0.642*** [3.24]	0.634*** [3.20]	0.645*** [3.26]	0.653*** [3.29]
Number of unaffordable items		0.236*** [3.15]	0.241*** [3.22]	0.236*** [3.15]	0.235*** [3.13]
<i>Indicators of recent negative shock</i>					
Entered low income since last year		-0.109 [0.37]	-0.072 [0.24]	-0.112 [0.38]	-0.107 [0.36]
Stopped saving since last year		-0.550** [2.17]	-0.536** [2.11]	-0.546** [2.15]	-0.550** [2.17]
Lost job since last year		0.643* [1.77]	0.705* [1.94]	0.643* [1.77]	0.649* [1.78]
<i>Other variables of interest</i>					
Not employed		0.802 [1.44]	0.798 [1.43]	0.806 [1.45]	0.796 [1.43]
Widowed/divorced		0.761 [1.64]	0.740 [1.59]	0.766* [1.65]	0.759 [1.64]
R ²	0.002	0.028	0.030	0.028	0.028
N individuals			2534		
N person-years			9091		

Notes: Within group estimation results. Absolute robust t-statistics in brackets. Dependent variable is 36-point GHQ12 score. Specifications [2] – [5] also include two labour market status dummies (part-time employed, self-employed), tenure in current status by current status, usual weekly hours of work (if working), spouse's employment status, region, housing tenure, housing type (detached, semidetached, terraced, flat), marital status, number and ages of children, occupation if employed, log house value, log of size of mortgage, persons per room, number of housing problems, year dummies, number of households in arrears, number of households suffering repossession, all measured at t.

***, **, * indicate statistical significance at the 1%, 5% and 10% confidence level respectively.

Table 7: Determinants of mental well-being, heads of households: BHPS 1991-2003

	Owner-occupiers		Tenants	
	Spec [1]	Spec [2]	Spec [3]	Spec [4]
<i>Indicators of financial situation</i>				
Log household income	-0.020 [0.27]	-0.019 [0.27]	-0.004 [0.05]	-0.002 [0.02]
In bottom quintile of equiv h'hold income distribn	0.494** [2.10]	0.495** [2.10]	0.393** [2.05]	0.391** [2.04]
Not currently saving regularly	0.318*** [3.66]	0.318*** [3.66]	0.662*** [4.11]	0.671*** [4.17]
Number of unaffordable items	0.093* [1.93]	0.093* [1.93]	0.296*** [4.99]	0.295*** [4.97]
<i>Indicators of recent negative shock</i>				
Entered low income since last year	0.049 [0.18]	0.047 [0.17]	-0.199 [0.89]	-0.199 [0.89]
Stopped saving since last year	-0.024 [0.22]	-0.023 [0.22]	-0.206 [1.00]	-0.206 [1.00]
Lost job since last year	0.333 [1.28]	0.331 [1.27]	0.798*** [2.80]	0.801*** [2.81]
<i>Other variables of interest</i>				
Not employed	1.705*** [5.60]	1.705*** [5.60]	1.197*** [2.73]	1.188*** [2.71]
Widowed/divorced	0.855** [2.56]	0.854** [2.55]	1.093** [2.53]	1.088** [2.51]
<i>Indicators of unsustainable housing commitment</i>				
In housing payment problems	1.047*** [7.82]	1.046*** [7.82]	0.922*** [5.18]	0.914*** [5.14]
In arrears	1.391*** [5.24]	1.389*** [5.24]	-0.424 [1.42]	-0.417 [1.39]
Evicted/repossessed t to t+1		0.504 [0.58]		0.828** [2.24]
R ²	0.026	0.026	0.033	0.034
N individuals	5187		3727	
N person-years	23717		11992	

Notes: Within group estimation results. Absolute robust t-statistics in brackets. Dependent variable is 36-point GHQ12 score. Specifications also include 2 labour market status dummies (part-time employed, self-employed), tenure in current status by current status, usual weekly hours of work (if working), spouse's employment status, region, housing tenure, housing type (detached, semidetached, terraced, flat), marital status, number and ages of children, occupation if employed, log house value, log of size of mortgage, persons per room, number of housing problems, year dummies, number of households in arrears, number of households suffering repossession, all measured at t.

***, **, * indicate statistical significance at the 1%, 5% and 10% confidence level respectively.

Appendix A: GHQ12 Questions.

At each date of interview, respondents are asked a series of twelve questions from the GHQ which take the following form:

“Have you recently:

1. Been able to concentrate on whatever you are doing?*
2. Lost much sleep over worry?
3. Felt that you are playing a useful part in things?*
4. Felt capable of making decisions about things?*
5. Felt constantly under strain?
6. Felt you couldn't overcome your difficulties?
7. Been able to enjoy your normal day to day activities?*
8. Been able to face up to your problems?*
9. Been feeling unhappy and depressed?
10. Been losing confidence in yourself?
11. Been thinking of yourself as a worthless person?
12. Been feeling reasonably happy, all things considered?*”

Answers to these questions are coded on a four-point scale running from ‘Disagree strongly’ (coded 0) to ‘Agree strongly’ (coded 3 – asterisked questions are coded in reverse). When added together they provide a GHQ12 score ranging from 0 to 36, with high scores corresponding to poor psychological health.

Appendix B: Determinants of mental well-being, Specification [2]: BHPS 1991-2002

Variables (measured at t)	Men		Women	
<i>Housing-related variables</i>				
Log house value if home owner	0.064	[1.12]	-0.045	[0.28]
Log monthly mortgage payments if home owner	0.059	[1.35]	0.192**	[2.09]
Local authority tenant (0,1)	1.480	[1.61]	0.623	[0.27]
Private tenant (0,1)	1.774*	[1.90]	0.772	[0.33]
Current dwelling semi-detached house (0,1)	0.108	[0.85]	-0.062	[0.14]
Current dwelling terraced house (0,1)	0.190	[1.27]	-0.225	[0.50]
Current dwelling flat/apartment (0,1)	-0.339*	[1.70]	-0.643	[1.32]
Current dwelling other type of housing (0,1)	-0.077	[0.34]	0.228	[0.41]
Ratio of household size to size of dwelling	0.355*	[1.86]	-0.246	[0.65]
Number of problems with current dwelling (0-11)	0.116***	[4.24]	0.053	[1.00]
<i>Demographic variables</i>				
Married (0,1)	-0.007	[0.03]	0.669	[1.21]
Cohabiting (0,1)	-0.315	[1.27]	0.503	[1.02]
Has one child (0,1)	0.174	[0.72]	0.411	[0.88]
Has two children (0,1)	0.149	[0.58]	0.326	[0.62]
Has three or more children (0,1)	0.345	[1.15]	0.116	[0.18]
Youngest child aged 0-4 years (0,1)	-0.229	[0.98]	-0.179	[0.48]
Youngest child aged 5-10 years (0,1)	-0.119	[0.50]	-0.469	[1.24]
Youngest child aged 11-16 years (0,1)	0.004	[0.02]	-0.423	[0.99]
<i>Economic variables</i>				
Part-time employee (0,1)	0.549*	[1.89]	0.320	[0.89]
Self-employed (0,1)	-0.206	[1.34]	0.102	[0.19]
Duration in unemployment if unemployed ('00 days)	-0.016*	[1.69]	0.006	[0.49]
Duration in employment if employed ('00 days)	0.012***	[6.37]	0.028***	[4.61]
Manual occupation (0,1)	-0.189*	[1.69]	-0.417	[1.46]
Usual weekly hours of work	0.007	[1.44]	-0.015	[1.12]
Spouse employed (0,1)	0.046	[0.45]	-0.288	[0.75]
<i>Macroeconomic variables</i>				
Number of households in England & Wales in arrears ('000s)	-0.008	[0.99]	-0.007	[0.39]
Number of households in England & Wales repossessed ('000s)	0.029	[0.59]	0.108	[0.99]

Notes: W-G results. t-statistics in brackets. Dependent variable=36-point GHQ12 score. Model includes region dummies, month and year dummies. ***, **, * indicate statistical significance at 1%, 5% & 10% level.