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**Unemployment Expectations, Credit
Commitments and Psychological
Health**

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UNEMPLOYMENT EXPECTATIONS, CREDIT COMMITMENTS AND PSYCHOLOGICAL HEALTH

by

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Abstract

Using individual-level panel data, this paper examines the relationship between subjective unemployment expectations and psychological health. Individuals expecting to become unemployed within the next year exhibit higher rates of suffering from anxiety plus worse psychological health based on the General Health Questionnaire (GHQ) Caseness measure. We investigate the role of household credit commitments in this relationship. In our sample holding credit is associated with better psychological health. However, credit commitments worsen the relationship between expected unemployment and psychological health. The strongest effect is found for unsecured credit, with the average effect of expected unemployment on psychological health is approximately twice as severe among those with outstanding unsecured credit commitments.

Key words: unemployment, psychological health, credit, indebtedness

JEL classification: I10, D14

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1. Introduction

The relationship between unemployment and health has generated a great deal of interest among health economists over the last 20 years. A broad range of studies drawing on individual level data from a wide spread of populations and samples have investigated the impact of unemployment on personal physical health, mental stress and social and emotional wellbeing (Clark and Oswald, 1994; Blanchflower, 1996; Hamilton et al., 1997; Korpi, 1997; Winkelmann and Winkelmann, 1998; Laporte, 2004). It is well established from panel data studies that entry into unemployment is associated with deterioration in psychological health, but the causality may be two-way. Studies based on mass layoffs and plant closures exogenous to individual health or behaviour find little evidence for effects on the general health of displaced workers (Browning et. al., 2006; Salm, 2009; Bockerman and Ilmakunnas, 2009; Schmitz, 2010; Kassenboehmer and Haisken-DeNaw, 2009). However, there is stronger evidence for effects on individual psychological health and related measures of life satisfaction (Kassenboehmer and Haisken-DeNaw, 2009; Charles and DeCicca, 2011).

Given these findings, we might expect that individuals facing the threat of unemployment also experience negative effects on their psychological health. A related literature mainly comprising studies from psychology finds that job insecurity is indeed a source of worse psychological health (for recent overviews of this literature see Cheng and Chan, 2008; Wichert, 2002), with some evidence that levels of psychological stress among those very likely to become unemployed are as poor as among the unemployed. There is also evidence that the impact of job insecurity on individual psychological health varies across individuals in a number of dimensions and has a strong cross-country dimension (Laszlo et al., 2010). Studies in the psychological literature suggest that disposition and attitude are

major mitigating factors (Ashford et al., 1989; Roskies et al., 1993). Cheng and Chan (2008) find stronger effects on job insecurity on the psychological health of older workers, who suffer more severe effects. Green (2011) finds individuals who consider themselves as more employable experience less deterioration in psychological health when faced with unemployment risk.

This paper uses individual level data incorporating psychological health measures used previously in this literature to investigate the relationship between unemployment expectations, credit commitments and psychological health. The role of credit commitments in this relationship has not been explored previously, although we might expect household indebtedness to be a major cause of psychological stress to those facing unemployment. Theory suggests access to credit is welfare improving as it allows households to smooth their consumption, including over periods of temporary income shocks arising due to events such as unemployment. However, outstanding debts require servicing and individuals at risk of unemployment face the prospect of potentially failing to service their credit commitments due to reduced income. Failure to meet credit commitments can result in penalty charges, withdrawal of current or future credit (for example, through the impact on an individual's credit score), attempts by creditors to recover monies owed through use of debt collection agencies, legal judgements against the individual, bankruptcy or even the repossession of housing against which mortgage debts are outstanding. Recent studies on the relationship between debt and psychological health show individuals with problem credit commitments exhibit much worse psychological health (Brown et al., 2005; Bridges and Disney, 2010; Gathergood, 2011).

Furthermore, Bridges and Disney (2004) show that unemployment is the most common cause of debt repayment difficulties among UK households. So we might expect that individuals facing the prospect of unemployment who have credit commitments

outstanding experience heightened anxiety and psychological stress compared with individuals who do not have outstanding debts. Outstanding debts represent credit commitments which, though they may be welfare improving by allowing individuals to smooth their consumption over time, require streams of repayments from future income and can present substantial financial burdens to households which experience reductions in income.

This investigation is undertaken using the UK household panel data set, which has previously been used to study the impact of unemployment on health outcomes (Clark and Oswald, 1994; Clark, 2003). We use a survey question on subjective unemployment expectations included in two waves of the panel during a previous period of high unemployment, the mid-1990s. We present results on how the impact of expected unemployment differs across individuals by age and gender. We then investigate the role of credit commitments – unsecured and secured – on the relationship between expected unemployment and psychological health. The advantage of using subjective expectations data in this analysis (also used in Green, 2011) is that we can observe the perceived risk of unemployment reported by the individual. This is preferred to using a proxy measure of unemployment risk such as the local or industry unemployment rate as it is the individual's own evaluation of their unemployment risk which will impact upon their psychological health. (though a recent study by Kompier et a. (2009) demonstrates the characteristics of employment contracts and implied job security impact upon psychological health). We then examine the relationship between unemployment expectations and psychological health using data on anxiety-related medical conditions and General Health Questionnaire (GHQ) scores, well established measures of psychological health in the literature.

We make three new contributions to the literature on unemployment and health. Firstly, we show that individuals in our sample who expect to become unemployed in the

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near future exhibit much worse psychological health scores, comparable in many cases to those of the unemployed. We show this relationship is robust to the modelling of individual fixed effects and in non-linear models which render unbiased estimates for categorical measures of psychological health. In our data individuals who consider unemployment to be 'very likely' or 'likely' (as opposed to 'unlikely' or 'very unlikely') number approximately twice as many as the currently unemployed. They exhibit rates of anxiety double those of those who do not expect to me made unemployed, and GHQ scores one and a half times as high. Estimates from multivariate models imply the expectation that unemployment next year is 'very likely' is associated with psychological health scores twice to three times as poor as those in employment.

Secondly, we investigate age and gender effects in this relationship. The previous literature has documented that the impact of unemployment on psychological health is more severe for younger workers and worse for women. We estimate interaction effects for older compared with younger workers and male compared with female workers. We find no evidence for age effects, but strong evidence that the threat of unemployment leads to less severe psychological health effects for men, despite men typically being the primary workers in households in our data. The psychological health effect of perceiving unemployment within the next year to be very likely or likely is approximately half as great for male compared with female workers.

Thirdly, we examine the relationship between unemployment risk, credit commitments and psychological health. We show that the impact of expected unemployment on psychological health is more severe for individuals with outstanding credit commitments. We examine two forms of credit commitments: outstanding balances on unsecured debts (such as credit cards) and outstanding mortgage debts. In both cases, holding moderate levels of debt is associated with better psychological health. However, the combination of holding

even low levels of debt together with facing a high likelihood of unemployment is associated with worse psychological health. Estimates imply the combination of being very likely to become unemployed together with holding consumer credit leads to an approximately twice as large an effect on psychological health. In the case of high levels of mortgage debt the impact is shown to be much smaller.

This is a very relevant issue at the current time. At any time a proportion of those in work face the threat of unemployment together with the worries, anxieties and stresses this is likely to bring. However, with high and rising unemployment in many OECD economies against a context of high levels of private and public indebtedness, a growing subset of workers face increased risk of job loss. At the time of writing, unemployment in the United Kingdom is increasing at the fastest rate for 17 years. So we might expect a growing proportion of those in employment to suffer the psychological stresses that brings. For example, a recent analysis of Google Instant Search data by Tefft (2011) shows that rates of internet search for 'depression' and 'anxiety' are higher in localities in which unemployment is growing faster. For policy purposes, it is important to identify and quantify the extent of these psychological aspects of expected unemployment. Our findings provide important insights into the magnitude of psychological health effects and the individual characteristics and circumstances, such as high levels of consumer debt, which mitigate or exaggerate these effects.

2. Data and Summary Statistics

2.1 The BHPS

We use the British Household Panel Survey (BHPS), a well-known long-running UK household panel survey. The BHPS is a general household survey which began with approximately 5,500 households from England and Wales in 1991. Adult members of the

household are interviewed on a range of socio-economic topics including their finances, labour market activity and health. The survey started in 1991 and has been conducted annually. The question relating to the likelihood of unemployment which we use to identify subjective unemployment expectations was included in the 1996 and 1997 waves only and was asked of all household members in employment. We limit the analysis sample to household heads and spouse/partners only who were either in employment in 1996 and 1997 or unemployed, to allow comparison between the psychological health of individuals by their subjective unemployment risk evaluation and those who are unemployed. As the data relating to unemployment expectations, psychological health and household indebtedness are particularly relevant for this analysis we now consider these in more detail.

2.2 Unemployment Expectations Question

In the two waves of data from 1996 and 1997 each adult member of the household currently in full-time or part-time employment was asked the following question: '*In the next twelve months how likely do you think it is that you will become unemployed?*'The selection of answers from which respondents could choose was 'very likely', 'likely', 'unlikely' and 'very unlikely'. The principal attraction of this question for our purposes is that it reveals a subjective evaluation of their likelihood of becoming unemployed. The main drawback of the question as a means of eliciting subjective evaluations of unemployment risk is that the four categories from which respondents choose may be perceived differently across respondents (Manski, 2004). Green (2010), for example, uses data from the Household, Income and Labour Dynamics in Australia Survey (HILDA) which incorporates a question in which individuals are asked to report their subjective probability of job loss on a scale from 0 to 100, though he notes the distribution of responses to this question in the HILDA data tended to be spiked around certain values and are overly pessimistic (Dickerson and Green, 2009).

There are two potential concerns when relating answers to this question to psychological health and making causal inferences about the relationship between the two. Firstly, while we would expect that the prospect of unemployment would impact upon psychological health, it has been recognised in the literature that an individual's poor general health, which may correlate with their psychological health, might affect their chances of becoming unemployed. There is evidence in the existing literature for the selection of workers into unemployment on the basis of poor health (García-Gómez et al., 2010; Arrow, 1996; Riphahn, 1999 and Lindholm et al., 2001).   Hence an individual's poor psychological health might lead them to report a high likelihood of near-term unemployment. Although the existing literature provides strong evidence that unemployment causally leads to deterioration in psychological health, this caveat is necessary when interpreting the relationship between subjective unemployment expectations and psychological health.

Secondly, a related concern is that an individual's psychological health state might impact upon their perceived likelihood of unemployment, that is, the causality might run from poor psychological health to a subjective evaluation of unemployment risk which suffers from perception bias. Individuals suffering anxiety and stress might be more likely to report they are at risk of adverse events such as unemployment, even if in objective terms they are not. However, due to the panel nature of the survey we are able to calculate rates of entry to unemployment within the following year and show that, despite high levels of attrition among those expecting to become unemployed, individuals who self-report a high likelihood of entering unemployment do exhibit high rates of entering into unemployment by the time of the next survey one year later.

2.3 Psychological Health Data

The BHPS includes two survey instruments related to psychological health. Firstly, in the health module of the survey all adult respondents in the household are 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, bad nerves, psychiatric problems*'. Respondents are asked to ignore temporary conditions when answering this question. We use answers to this question to construct an indicator variable which takes a dummy variable form with a value of 1 for yes and 0 for no.

Secondly, The BHPS also includes the General Health Questionnaire (GHQ) in each wave. The GHQ comprises 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. Responses to the GHQ forms the basis for the 'GHQ Caseness Score', also known as the 'Caseness GHQ', a well-known scale 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 experiencing six negative feelings 'rather more than usual' or 'much more than usual', or experiencing six positive feelings 'less so than usual' or 'much less so than usual'. Hence a score of 12 indicates the individual reported they feel each of the 6 negative feelings at least 'rather more than usual' plus each of the 6 positive feelings less or much less than usual, and a score of 0 indicates the individual feels each of the 6 negative feelings not more than 'no more than usual' and each of the positive feelings at least as much as 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. For the purposes of our analysis we use the GHQ Caseness score ordered between 0 and 12, with 12 representing the poorest state of psychological health.

2.4 Household Debt Data

The BHPS does not include detailed asset and debt data in the waves of data which include the question on unemployment expectations. However, the survey does provide some data on debt holdings in each wave derived from a series of questions asked of the household head. In each wave household heads are asked a series of questions about their housing tenure, value of owner-occupied housing and types and duration plus the value of outstanding mortgage debt secured against first and additional homes. In addition, the household head is asked whether the household has any outstanding consumer credit. From these data we can obtain partial information on household credit commitments and we use this to investigate the impact of household indebtedness on the relationship between expected unemployment and psychological health. For household mortgage debts we are able to construct measures of indebtedness and leverage such as the household's loan-to-value ratio and loan-to-income ratio. For consumer credit debt we can construct an indicator variable for whether the household has outstanding consumer credit commitments. We show that these variables are significant factors in determining the severity of effect of unemployment expectations on psychological health.

2.5 Summary Statistics

Summary statistics for the BHPS sample are provided in Table 1. In our analysis the whole sample comprises household heads plus their spouse/partner who were present in the survey in the 1996 and/or 1997 waves and either in employment or unemployed. There are approximately 8,200 individual-year observations over the two years with summary statistics

provided in Column 1. Of the whole sample 95% of individuals are employed and 5% unemployed. Summary statistics by unemployment status are provided in Columns 2 and 3. Compared with those in employment, unemployed individuals are typically more likely to be female, less likely to be married and homeowners, be less educated and exhibit household gross monthly incomes of approximately half the value of those in employment. The rate of suffering anxiety among the unemployed (14%) is also nearly three times that of the employed (5%) and the unemployed exhibit GHQ Caseness scores which are 75% higher than those in employment.

The distribution of GHQ Caseness scores for those in employment is illustrated in Table 2. The majority of the sample, 55%, exhibits a GHQ Caseness score of 0, implying they experience none of the negative feelings more than usual and none of the positive feelings less than usual. Approximately 13% of individuals exhibit a score of 1, implying they experience one non-usual positive or negative feeling. The remaining 32% of the sample exhibit a range of GHQ Caseness scores, though only 5% of the sample shows signs of very high levels of unusually adverse feelings in excess of 8. Hence, by this measure the typical psychological state of an individual in employment is to experience no adverse feelings of lack of positive feelings any more than usual, though a subgroup of the sample shows very poor levels of psychological health.

Table 3 provides average GHQ Caseness scores and rate of suffering anxiety across individuals by likelihood of becoming unemployed. In addition, the first row of the table provides information on average levels of psychological health among the unemployed. Among the 7,752 observations of individuals in employment (rows 2 to 5), 221 consider unemployment next year to be very likely and 564 consider unemployment next year to be likely. So in total 785 employed individuals (10% of those employed) expect to become unemployed by the next wave. Hence more than one-and-a-half times the number of currently

unemployed workers expect to become unemployed in the near future. The remaining 90% of employed individuals do not expect to become unemployed, with approximately four out of seven judging next year unemployment to be unlikely and three out of seven considering it very unlikely.

Those who expect to become unemployed exhibit worse psychological health, in many cases comparable to that among the unemployed. Compared to the group who consider unemployment to be very unlikely who have an average GHQ Caseness score of 1.59, among those answering 'very likely' the average GHQ Caseness score is 70% higher at 2.69, for those answering 'likely' it is 43% higher at 2.27. Both these differences in means are statistically significant at the 0.01% level. Among the 'unlikely' group the score is 12% higher at 1.78 and this difference, though smaller in magnitude, is nevertheless statistically significant from zero at the 1% level. Using the alternative psychological health indicator of rates of suffering anxiety, compared with the 'very unlikely' group those in the 'very likely' group exhibit rates of suffering anxiety two and a half times higher and double for the 'likely' group with these differences significant at the 0.1% level. Rates of suffering anxiety among the 'unlikely' group are higher by one percentage point, but this value is not statistically significantly different from the rate of anxiety in the very unlikely group.

Using the panel element of the survey it is possible to compare next-year unemployment rates to individual subjective unemployment expectations. Attrition is not uniform across individuals by their unemployment expectation. Next-year attrition rates by unemployment expectation are: very likely 33%, likely 18%, unlikely 10%, very unlikely 9%. Among those who do not attrite the sample, the next-year unemployment rates by unemployment expectation are: very likely 43%, likely 34%, unlikely 3%, and very unlikely 0.1%. These percentages suggest the 'likely' and 'very likely' groups have much higher rates of next-year unemployment. Although neither of these rates is above 50% if positive

selection into attrition arises due to unemployment is it quite possible that the actual unemployment rates among these groups are close to or above 50%. On this basis we conclude that the subjective unemployment expectations data is not severely affected by perception-bias arising from poor psychological health.

3. Results

3.1 Unemployment expectations and psychological health

The summary statistics illustrate a positive relationship between unemployment expectations and poor psychological health. We now investigate whether this relationship is robust to controlling for a broad range of demographic and socio-economic characteristics plus unobserved heterogeneity in an econometric model. The basic regression we estimate is to regress the measure of psychological health against the individual unemployment expectations variable, controlling for a broad range of socio economic, financial, educational and demographic characteristics which potentially impact upon psychological health. As we have unemployment expectations data for two consecutive waves of the survey we can also incorporate individual fixed effects into the model which condition on time-invariant individual specific heterogeneity in the data, such as genetic factors.

As both measures of psychological health have features of categorical variables, we present a variety of results using different estimators. Results are first presented using an ordinary least squares estimator with and without fixed effects. This allows us to examine the sensitivity of our results to the incorporation of individual fixed effects. Although this estimator does not take account of the categorical nature of the data, it has been shown that time-invariant unobserved heterogeneity is important for understanding the determinants of health and wellbeing (Ferrer-i-Carbonell and Fritters, 2004). We then present results for non-linear models estimated on the cross-section only as the non-linear models we use are biased

by the inclusion of fixed effects. In the case of the GHQ Caseness score we use a Tobit estimator as the scale is bounded at 0 and could be considered to be a censored measure of psychological health for which OLS estimates will exhibit censoring bias. In the case of the indicator variable for whether an individual suffers anxiety we present the OLS results with and without fixed effects together with Probit estimates.

Our baseline results for the relationship between unemployment expectations and psychological health are presented in Table 4. Selected covariates are reported in the table, the full set of covariates is described in detail in the notes accompanying the table. All models include region dummy variables. Turning first to the covariates, the pattern in the coefficient estimates show psychological health typically worsens with age (non-linearly), is worse for women compared with men and (in pooled estimates) is worse for those who are divorced (though in the fixed effects models we have relatively few observations for individuals transitioning between marriage and divorce). The negative coefficient on household income indicates higher income households exhibit better psychological health, though these coefficients are in each model not statistically significantly different from zero.

For the unemployment expectations dummy variables (rows 1-3) the omitted group is those individuals who report next-year unemployment to be very unlikely. The results from the pooled OLS estimates (column 1) indicate that, compared to the very unlikely group, each unemployment expectation dummy is associated with a higher GHQ Caseness score. The coefficients are in each case statistically significantly different from zero at the 1% level. The coefficient on the unlikely dummy variable implies the relation between considering next-year unemployment to be unlikely as opposed to very unlikely is to increase the GHQ Caseness score by 0.28 points. In the case of the likely and very likely categories the equivalent values are 0.81 and 1.20. Against a baseline predicted probability from the empirical model of 1.70 (close to the unconditional sample average of 1.77) in the sample of

employed individuals, these coefficient values equate to increases in the GHQ Caseness score of 16%, 48% and 71% respectively. The coefficients on the unlikely and likely variables are statistically significantly different from one another at the 1% level (F-statistic: 18.14) as is also the case for the unlikely and very likely variables (F-statistic: 23.04). The coefficients on the likely and very likely variables are different at only the 8% level (F-statistic: 3.11).

Column 2 presents the fixed effects estimates. In this specification the coefficient estimate for the likely dummy variable is as before and for the very likely dummy variable increases. In these estimates the coefficient on the unlikely dummy variable is not statistically significantly different from zero. The coefficients on the likely and very likely dummy variables are associated with increases in the GHQ Caseness score (compared with the baseline very unlikely group) of 34% and 73% respectively. The pattern in the statistical significance of the difference between the coefficients is similar to before, though in this case the likely and very likely coefficients are different at the 1% level. The F-statistics in each case are: unlikely compared against likely (16.04), unlikely compared against very likely (28.29), likely compared with very likely (6.82).

Tobit estimates are presented in Column 3. The coefficients on the variables are in each case stronger and significant at higher levels of statistical confidence. The coefficients imply effects for the unlikely, likely and very likely variables of 41%, 113% and 142% respectively plus the pattern in the test statistics is as in Column 2 but with higher levels of confidence in each case. Although the Tobit model does not allow for fixed effects, these estimates are our preferred estimates as the OLS estimates exhibit censoring bias. The inclusion of the fixed effects in the OLS estimates did not substantially alter the results, showing that controlling for unobserved heterogeneity is not essential for the key parameters of interest in these empirical models.

Columns 4 to 6 repeat these models with the anxiety indicator as the dependent variable. In these estimates the pattern in the coefficients is similar to that found in the models with the GHQ Caseness score as the dependent variable, though in each case the coefficient on the unlikely variable is not statistically significant from zero. The fixed effects estimates return very similar coefficient values to the pooled estimates. In these models the likely and unlikely coefficients are statistically significantly different from the unlikely coefficient values at the 1% level. The likely and very likely coefficients are different from one another at the 5% level. The F-statistics from the fixed effects model in column 5 are: unlikely compared against likely (7.04), unlikely compared against very likely (10.26), likely compared with very likely (5.83). The equivalent F-statistics from the Probit model estimates in column 6 are (7.16), (8.16) and (6.08) respectively. The marginal effects reported in column 6 evaluated against a baseline predicted probability of 4% imply effects for the very likely variable of 100% and for the likely variable 75%.

Summarising the results from the non-linear multivariate models, these results indicate that reporting unemployment in the next year to be very likely as opposed to very unlikely is associated with increases in levels of psychological stress is of a magnitude between twice to two-and-a-half times as high as the average in the sample. In the case of reporting unemployment next year to be likely as opposed to very unlikely, the associated increase in psychological stress is of a magnitude between twice to two-and-a-half times as high as the average in the sample. Hence these results establish a sizeable association between subjective unemployment expectations and psychological health. In the next sections we investigate whether these effects differ across individuals by age and gender characteristics, then subsequently by household credit commitments.

3.2 Age and Gender Effects

In this section we introduce age and gender interaction terms into the models. Firstly, we examine whether the impact of expected unemployment on psychological health varies across older and younger individuals by incorporating a 1/0 dummy variable which indicates the individual is aged below 45. Results are presented in Table 5. The non-interacted unemployment expectation variables (rows 1-3) represent the association between the unemployment expectation and psychological health for older individuals. The coefficients on the interaction terms (rows 4-6) are added to the coefficient on the non-interaction term to give the effect for younger individuals. The coefficient on the 1/0 dummy indicating the individual is in the young category (row 7) gives the difference in psychological health between the old and young groups. Hence the omitted group is all individuals who consider next-wave unemployment as very unlikely.

In the models in which the GHQ Caseness score is the dependent variable (rows 1-3), excepting the fixed effects specification (which exploits only a small number of marginal group changes), the coefficient on the young indicator variable is positive, indicating that younger individuals have worse psychological health. The non-interacted terms which provide the effects for older individuals are very similar to those in Table 3. There is no consistent pattern in the direction and magnitudes of the coefficients on the interaction terms. The coefficients on the very likely and likely interaction terms are positive, implying the young exhibit worse psychological health compared with the old in these states. However, none of these coefficients are statistically significantly different from zero. The same is the case for the models with the suffering anxiety indicator as the dependent variable in columns 4-6. The interaction term involving the unlikely variable yields sometimes negative, sometimes positive coefficients. On this basis, we conclude there is no evidence from these estimates for age effects in the relationship between unemployment expectations and psychological health.

Table 6 presents estimates from models which include gender interaction terms. The unemployment expectation and gender interaction terms are implemented using the same structure as in Table 5, with the baseline group being all individuals who reported next-year unemployment as very unlikely. The pattern in the coefficients indicates that, across the range of unemployment expectations, the prospect of unemployment has a less severe impact on male individuals in the sample compared with females. The magnitude of the difference between the effects of expected unemployment on the psychological health of men compared with women is quite large, with estimates implying men experience an effect of between one third to one-half that experienced by women. Our result here is unexpected: as men are commonly the primary earner in British households, one might expect the prospect of unemployment would be a greater cause of psychological stress for men compared with women, but these results show otherwise.

3.3 The Role of Credit Commitments

In this section we analyse the role of household credit commitments in the relationship between unemployment risk and psychological health. We implement this analysis by identifying households with credit commitments using three measures. Firstly, we identify households with existing consumer credit commitments. Due to the limited data on consumer credit holdings available in the waves of the BHPS used in this analysis, we do not have a measure of the value of outstanding consumer credit, but we do know whether the household holds at least one consumer credit item. We construct a 1/0 dummy indicator variable to designate households with consumer credit debts. Secondly, we identify households with mortgage commitments.

As we have more detailed data on the value of housing and outstanding mortgage debts for all homeowners in the sample, we can construct loan-to-income ratios for each

home owning household in the same (the value of all loans secured against housing held by the household divided by the value of annual household income). We first construct a 1/0 dummy indicator to designate that a household is a mortgaged homeowner. We then construct an indicator for a higher-debt household which is a 1/0 dummy variable to designate whether the household has outstanding mortgage debts which total at least twice household income (i.e. a loan-to-income ratio of 2 or higher). We then incorporate interaction terms into our specifications following the structure employed in the previous section.

Results from regressions incorporating the consumer credit indicator are shown in Table 7. The coefficient on the consumer credit indicator variable (row 7) is insignificant in most specifications, but is significant in the fixed effects specification for the model in which the GHQ Caseness score is the dependent variable (column 2). Hence obtaining consumer credit is associated with an improvement in psychological health. However, the interaction terms in rows 4-6 indicate the combination of holding consumer credit together with expecting to become unemployment is associated with worse psychological health. In the specifications in which the GHQ Caseness score is the dependent variable estimated using OLS (columns 1 and 2) the coefficient values on the interaction terms imply those individuals expecting to become unemployed from households with positive consumer credit balances exhibit scores which are approximately twice the magnitude of individuals who expect to become unemployed but do not have consumer credit balances. Estimates from the Tobit model (column 3) imply an effect which is approximately one third less than this. For the regressions in which the anxiety indicator is the dependent variable the coefficient values imply an effect which approximately doubles the rate of anxiety for the likely and very likely groups.

Tables 8 and 9 present results for the regressions with interaction terms which capture the mortgage position of the household. In the specifications reported in Table 8 an

interaction term for whether the individual comes from a household with an outstanding mortgage is included in the specification. In this model the baseline group against which the mortgage interaction terms should be compared is all households (including private renters, social renters plus outright owners) who consider the prospect of becoming unemployed within the next year as very unlikely. The pattern of the coefficients in Table 8 implies that there is no statistically significant difference in the psychological health of mortgage holding individuals, independent of unemployment risk (row 7) or in combination with mortgage risk (rows 4-6). Hence the prospect of unemployment does not increase the psychological stress of mortgage holding home owners per se.

In Table 9 we incorporate an interaction term for whether the outstanding mortgage held by the household exceeds twice the value of household annual income. This interaction term is intended to capture individuals from households with more sizeable mortgage debts, and hence larger mortgage repayment commitments. The coefficient on the dummy indicator variable (row 7) is negative and statistically significant in the specifications in which the GHQ Caseness score is the dependent variable. The magnitude of -0.34 in the Tobit specification evaluated against a baseline predicted probability of 1.70 implies that an individual from a household with a large mortgage (by this measure) typically exhibits a score 20% lower compared with an individual with a smaller or no mortgage. Hence holding a large amount of mortgage debt is actually associated with better psychological health. This may be due to the fact that obtaining a mortgage is in part dependent on a steady stream of income to the household or other criteria for accessing mortgage credit which correlate with psychological health.

However, the positive and statistically significant coefficients on the interaction terms between the indicator variable for holding high levels of mortgage debt together with the unemployment expectation variables imply worse psychological health for such households

when faced with the prospect of unemployment. The coefficients in the Tobit specifications imply the effects of unemployment next year being very likely together with mortgage debts in excess of twice household income is to increase the GHQ Caseness Score by 0.49 points, compared with an effect for individuals without this level of mortgage debt of 1.89 points. The effect on the likelihood of suffering anxiety is to increase the predicted probability by three percentage points, compared with an effect of four percentage points for those without high levels of mortgage debts. Hence the association between very likely unemployment and psychological health for those with high levels of mortgage debts is between 30-75% higher compared with those with lower levels of mortgage debt or no mortgage debt.

Taken together, these estimates for the impact of household credit commitments on the relationship between unemployment risk and psychological health show that the financial position of the household of which the individual is part has a strong impact on the psychological stress associated with expected unemployment. The results indicate a stronger role for consumer credit commitments compared with mortgage debts – plausibly due to the fact that consumer credit it typically repaid at higher frequency and involves much higher monthly interest charges compare with mortgage credit and that whereas mortgage debts are secured against housing which could be sold to pay down household debts, unsecured consumer credit borrowing has to be repaid solely from future income which falls upon unemployment, or otherwise via the liquidation of financial assets. It is also notable that for households not facing expected unemployment holding either consumer credit or mortgage debt is associated with better psychological health, but expected unemployment reverses this relationship.

4. Conclusion

This study has examined the relationship between expected unemployment and psychological health using individual level panel data, with a particular focus on the role of credit commitments in this relationship. To the author's knowledge, this is the first study to present evidence on the role of credit commitments in this relationship. Findings show that even moderate differences in individuals' unemployment expectations between those who consider unemployment within the next year to be very unlikely and those who consider unemployment unlikely are associated with statistically significant differences in psychological health. Furthermore, individuals who consider unemployment to be more likely than not exhibit on average much worse psychological health; closer to that of the unemployed. These effects are not readily explained by a broad set of individual and household level controls.

Further results have shown that the relationship between expected unemployment and psychological health is heavily gender dependent, despite relatively weak differences in psychological health attributable to gender differences apart from expected unemployment. Large effects also arise from differences in credit commitments across households. Although estimates show that psychological health among those with outstanding credit is typically better compared with those who do not hold credit, the combination of expected unemployment together with outstanding credit commitments worsens psychological health, particularly so in the case of consumer credit commitments. We conclude that household credit commitments act as another form of 'misery multiplier', a term originally coined by Green (2011) for the negative impact of low levels of perceived employability of the psychological health of those expecting to become unemployed.

These results suggest a number of policy implications. Primarily, as expected unemployment is shown to impact upon psychological health, even where the expectation is nevertheless low, there is a clear implied need for individuals to have accurate expectations

of the likelihood of unemployment. It is common in the UK for employers considering making workers redundant to undertake a staged process of selecting potential employees for redundancy, a process which typically involves informing a broad group of employees of the employer's intention to cut the size of their workforce. Raising the prospect of unemployment across a broad group of workers, even where the chance of unemployment for an individual worker remains nevertheless low, may have very adverse health effects on the workforce as a whole, as our results show even a small change in unemployment expectations is shown to impact upon psychological health.

Beyond this, our results imply that the unevenness of the impact of expected unemployment across individuals by gender and financial position suggests support for those facing the prospect of unemployment might be better targeted to particular subgroups of individuals. While employment law properly forbids discrimination on the basis of gender when selecting workers to face redundancy, it may nevertheless be the case that differential impacts upon psychological health warrant differential provision of counselling and assistance to workers along gender lines. Our results relating to credit commitments might be taken as indicating a stronger role for 'payment protection' insurance, despite its poor reputation in the UK, and other forms of insurance for those unable to meet credit repayments due to reduced income or job loss.

These results also imply that studies seeking to understand the relationship between unemployment and health should take account of differential unemployment expectations on the part of workers in the samples under analysis. Studies in the existing literature typically estimate the impact of unemployment on health taking a sample of workers in employment as the relevant at risk group. However, a more accurate approach would be to consider individuals in employment as facing differing risks of unemployment, with variation in underlying psychological health arising from differentiation in this risk. This may be

particularly relevant to studies which exploit, for example, the panel dimension of household surveys and typically estimate the implied effects of unemployment using first-differences in the data. Where unemployment is expected, our results show much of the increase in psychological stress will occur ahead of the actual unemployment event.

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Table 1
Summary Statistics for BHPS Sample

	(1) Whole Sample	(2) Employed	(3) Unemployed
N	8,219	7,752	467
Demographics			
Age	40.8	40.8	41.8
Male	0.50	0.51	0.34
Married	0.83	0.83	0.69
Has Children	0.45	0.45	0.45
Ethnic Minority Group	0.03	0.03	0.04
Home Owner	0.79	0.81	0.40
Highest Educational Qualification			
GCSE	0.34	0.34	0.32
A-level	0.19	0.19	0.13
Degree	0.15	0.15	0.11
Employment Status			
Employed	0.95	1.00	0.00
Unemployed	0.05	0.00	1.00
Household Income (Monthly, £s)	£2,255	£2,317	£1,160
Psychological Health Measures			
GHQ12 Score	1.84	1.77	3.08
Anxiety	0.06	0.05	0.14

Table 2:
Distribution of General Health Questionnaire
Caseness Score

Score	Number	%
12	101	1.30
11	84	1.08
10	86	1.11
9	109	1.41
8	118	1.52
7	160	2.06
6	195	2.52
5	243	3.13
4	299	3.86
3	448	5.78
2	599	7.78
1	1,035	13.35
0	4,275	55.15
Total	7,752	100

Table 3
Unemployment, Unemployment Expectations and Psychological Health

		N	GHQ12 Score		Anxiety	
			Score (0-12)	*P-value for difference from 5.*	Prob.	*P-value for difference from 5.*
	1. Unemployed	467	3.08	*0.0000*	0.14	*0.0000*
	2. Very likely	221	2.69	*0.0000*	0.10	*0.0005*
2. to 5. Employed but considers unemployment next year to be:	3. Likely	564	2.27	*0.0000*	0.08	*0.0002*
	4. Unlikely	3,911	1.78	*0.0085*	0.05	*0.2112*
	5. Very Unlikely	3,056	1.59		0.04	

Table 4
Unemployment Expectations and Psychological Health
Pooled and Fixed Effects Regression Estimates

	GHQ12 Score			Anxiety		
	(1.) Pooled	(2.) Fixed Effects	(3.) Tobit	(4.) Pooled	(5.) Fixed Effects	(6.) Probit
Base group: very unlikely						
1. Very Likely	1.20**	1.60**	2.40**	0.05**	0.05**	0.04**
	(0.19)	(0.29)	(0.38)	(0.02)	(0.02)	(0.01)
2. Likely	0.81**	0.80**	1.90**	0.03**	0.04*	0.03**
	(0.13)	(0.20)	(0.26)	(0.01)	(0.02)	(0.01)
3. Unlikely	0.28**	0.07	0.69**	0.01	0.01	0.01
	(0.07)	(0.11)	(0.14)	(0.01)	(0.01)	(0.01)
Selected control variables						
4. Age	0.06*	-	0.12*	0.003	-	0.004*
	(0.03)		(0.05)	(0.002)		(0.002)
5. Age-Squared	-0.0008*	-	-0.019**	-0.00003	-	-0.0005
	(0.0002)		(0.0005)	(0.00002)		(0.0003)
6. Male	-0.53**	-	-1.09**	-0.04**	-	-0.03**
	(0.07)		(0.14)	(0.01)		(0.004)
7. Married	-0.23	-0.81	-0.56*	-0.01	-0.06	-0.01
	(0.15)	(0.57)	(0.28)	(0.01)	(0.04)	(0.01)
8. Divorced	0.59**	-0.37	0.97**	0.04**	0.01	0.02
	(0.17)	(0.67)	(0.33)	(0.01)	(0.05)	(0.01)
9. Has Children	0.03	-0.62	0.05	0.02	0.02	0.02
	(0.13)	(0.33)	(0.26)	(0.01)	(0.02)	(0.01)
10. Household Income (Monthly, £0,000s)	-0.43	-0.25	-0.36	-0.004	-0.002	-0.004
	(0.31)	(0.24)	(0.58)	(0.003)	(0.006)	(0.006)
Fixed Effects	No	Yes	No	No	Yes	No
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Individuals	7752	7752	7752	7752	7752	7752
Number of Groups	-	4542	-	-	4542	-
Av. Obs. Per Group	-	1.7	-	-	1.7	-
R2 / Pseudo R2	0.04	0.02	0.04	0.03	0.02	0.05
F / LR	11.38	5.92	11.46	8.14	5.81	158.47
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

*Notes: **denotes statistical significance at 1% level, * denotes statistical significance at 5% level. Variables shown in results table: chance of unemployment next year (very likely, likely, unlikely, base group 'very unlikely'), age in years, age-squared in years,1/0 dummy variable for male respondent, 1/0 dummy variables for married/co-habiting and divorced (based group single/widows, not shown), 1/0 dummy for has children, household income in £0,000s. Control variables not shown in results table: 1/0 dummy for being from an ethnic minority group, 1/0 dummies for outright homeowner, mortgaged homeowner, private renter (base group social renter);1/0 dummies for number of children aged 0-3, 3-5, 6-11, 12-15, 16-18; 1/0 dummy variables for spouse employed, spouse self-employed, spouse-unemployed (base group is spouse not in labour force); 1/0 dummies for whether member of occupational pension scheme, whether smokes, whether moved house last year, whether moved job last year, whether unemployed for at least one month within last 3 years, whether absent from work due to sickness for at least once month in last 3 years, whether out of the labour force for at least one month within last 3 years.*

Table 5
Unemployment Expectations and Psychological Health – Age Effects
Pooled and Fixed Effects Regression Estimates

	GHQ12 Score			Anxiety		
	(1.) Pooled	(2.) Fixed Effects	(3.) Tobit	(4.) Pooled	(5.) Fixed Effects	(6.) Probit
Base group: very unlikely						
1. Very Likely	1.01**	1.07**	2.21**	0.05**	0.06**	0.05**
	(0.28)	(0.42)	(0.58)	(0.02)	(0.03)	(0.02)
2. Likely	0.64**	0.48**	1.77**	0.04**	0.04**	0.04**
	(0.19)	(0.20)	(0.40)	(0.02)	(0.02)	(0.02)
3. Unlikely	0.34**	0.17	0.91**	0.01	0.02*	0.01
	(0.11)	(0.11)	(0.25)	(0.01)	(0.01)	(0.01)
Age effects:						
4. Very Likely, Young=1	0.32	0.96	0.30	-0.02	0.07	-0.01
	(0.38)	(0.59)	(0.78)	(0.03)	(0.05)	(0.02)
5. Likely, Young=1	0.32	0.50	0.25	-0.02	0.01	0.01
	(0.26)	(0.39)	(0.52)	(0.02)	(0.01)	(0.01)
6. Unlikely, Young=1	-0.07	0.38*	-0.29	-0.01	-0.02	0.01
	(0.14)	(0.21)	(0.30)	(0.01)	(0.02)	(0.01)
7. Young=1	0.22*	-0.81	0.76**	-0.01	0.03	-0.01
	(0.11)	(0.67)	(0.25)	(0.01)	(0.05)	(0.01)
Fixed Effects	No	Yes	No	No	Yes	No
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Individuals	7752	7752	7752	7752	7752	7752
Number of Groups	-	4542	-	-	4542	-
Av. Obs. Per Group	-	1.7	-	-	1.7	-
R2 / Pseudo R2	0.03	0.02	0.02	0.02	0.02	0.05
F / LR	10.36	2.62	321.68	5.72	1.60	151.44
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0231	0.0000

Notes: see Table 4

Table 6
Unemployment Expectations and Psychological Health – Gender Effects
Pooled and Fixed Effects Regression Estimates

	GHQ12 Score			Anxiety		
	(1.) Pooled	(2.) Fixed Effects	(3.) Tobit	(4.) Pooled	(5.) Fixed Effects	(6.) Probit
Base group: very unlikely						
1. Very Likely	1.57**	1.94**	3.24**	0.04**	0.04**	0.04**
	(0.28)	(0.41)	(0.56)	(0.02)	(0.02)	(0.02)
2. Likely	0.93**	0.74**	2.41**	0.04**	0.04**	0.04**
	(0.19)	(0.29)	(0.37)	(0.02)	(0.02)	(0.02)
3. Unlikely	0.36**	0.12*	1.02**	0.01	0.02*	0.01
	(0.09)	(0.13)	(0.20)	(0.01)	(0.01)	(0.01)
Gender effects:						
4. Very Likely, Male=1	-0.72**	-0.68**	-1.59**	-0.02*	-0.02*	-0.02*
	(0.28)	(0.30)	(0.46)	(0.01)	(0.01)	(0.01)
5. Likely, Male=1	-0.23**	-0.17**	-0.96**	-0.02*	-0.02	-0.02*
	(0.10)	(0.06)	(0.32)	(0.01)	(0.02)	(0.01)
6. Unlikely, Male=1	-0.16*	-0.10*	-0.60*	-0.01	-0.01	-0.01
	(0.08)	(0.06)	(0.27)	(0.01)	(0.01)	(0.01)
7. Male=1	-0.31**	-	-092**	-0.04*	-	-0.02**
	(0.08)		(0.19)	(0.02)		(0.006)
Fixed Effects	No	Yes	No	No	Yes	No
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Individuals	7752	7752	7752	7752	7752	7752
Number of Groups	-	4542	-	-	4542	-
Av. Obs. Per Group	-	1.7	-	-	1.7	-
R2 / Pseudo R2	0.04	0.02	0.02	0.02	0.02	0.05
F / LR	10.47	2.33	351.46	5.87	1.57	161.72
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0266	0.0000

Notes: see Table 4

Table 7
Unemployment Expectations, Consumer Credit Commitments and Psychological Health
Pooled and Fixed Effects Regression Estimates

	GHQ12 Score			Anxiety		
	(1.) Pooled	(2.) Fixed Effects	(3.) Tobit	(4.) Pooled	(5.) Fixed Effects	(6.) Probit
Base group: very unlikely						
1. Very Likely	1.02**	1.07**	1.90**	0.04**	0.04**	0.04**
	(0.25)	(0.37)	(0.49)	(0.02)	(0.02)	(0.02)
2. Likely	0.57**	0.89**	1.41**	0.04**	0.04**	0.04**
	(0.25)	(0.40)	(0.34)	(0.02)	(0.02)	(0.02)
3. Unlikely	0.13*	0.33**	0.59**	0.01	0.02*	0.01
	(0.06)	(0.18)	(0.19)	(0.01)	(0.01)	(0.01)
Credit commitments:						
4. Very Likely, Credit=1	0.93**	1.07**	1.13**	0.07**	0.04**	0.04**
	(0.40)	(0.45)	(0.34)	(0.02)	(0.02)	(0.02)
5. Likely, Credit=1	0.74**	0.74**	1.04**	0.04**	0.03**	0.03**
	(0.31)	(0.25)	(0.26)	(0.01)	(0.01)	(0.01)
6. Unlikely, Credit=1	0.23*	0.33**	0.46**	0.02*	0.01	0.02
	(0.10)	(0.12)	(0.18)	(0.01)	(0.01)	(0.02)
7. Credit=1	0.10	-0.34**	0.30	0.01	-0.01	0.01
	(0.05)	(0.10)	(0.21)	(0.01)	(0.01)	(0.01)
Fixed Effects	No	Yes	No	No	Yes	No
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Individuals	7752	7752	7752	7752	7752	7752
Number of Groups	-	4542	-	-	4542	-
Av. Obs. Per Group	-	1.7	-	-	1.7	-
R2 / Pseudo R2	0.04	0.02	0.02	0.02	0.02	0.05
F / LR	10.55	2.14	350.54	6.03	1.78	167.61
Prob > F	0.0000	0.0003	0.0013	0.0000	0.0013	0.0000

Notes: see Table 4

Table 8
Unemployment Expectations, Mortgage Holding and Psychological Health
Pooled and Fixed Effects Regression Estimates

	GHQ12 Score			Anxiety		
	(1.) Pooled	(2.) Fixed Effects	(3.) Tobit	(4.) Pooled	(5.) Fixed Effects	(6.) Probit
Base group: very unlikely						
1. Very Likely	1.17**	1.66**	2.31**	0.04**	0.04**	0.04**
	(0.31)	(0.48)	(0.62)	(0.02)	(0.02)	(0.02)
2. Likely	0.89**	1.10**	2.04**	0.04**	0.04**	0.04**
	(0.21)	(0.33)	(0.43)	(0.02)	(0.02)	(0.02)
3. Unlikely	0.36**	0.41**	0.65**	0.01	0.02*	0.01
	(0.12)	(0.12)	(0.26)	(0.01)	(0.01)	(0.01)
Credit commitments:						
4. Very Likely, Mortgage=1	0.03	0.11	0.14	0.04	0.01	0.02
	(0.40)	(0.60)	(0.79)	(0.04)	(0.04)	(0.03)
5. Likely, Mortgage=1	0.12	0.45	0.23	0.02	0.02	0.02
	(0.15)	(0.40)	(0.53)	(0.02)	(0.03)	(0.03)
6. Unlikely, Mortgage=1	0.02	0.23	0.06	0.01	0.01	0.01
	(0.15)	(0.21)	(0.30)	(0.01)	(0.01)	(0.02)
7. Mortgage=1	-0.04	0.38	0.18	-0.01	0.06	0.02
	(0.11)	(0.27)	(0.24)	(0.01)	(0.06)	(0.03)
Fixed Effects	No	Yes	No	No	Yes	No
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Individuals	7752	7752	7752	7752	7752	7752
Number of Groups	-	4542	-	-	4542	-
Av. Obs. Per Group	-	1.7	-	-	1.7	-
R2 / Pseudo R2	0.04	0.02	0.02	0.02	0.02	0.05
F / LR	9.99	2.28	343.63	5.67	1.78	160.70
Prob > F	0.0000	0.0001	0.0000	0.0000	0.0013	0.0000

Notes: see Table 4

Table 9
Unemployment Expectations, Mortgage Leverage and Psychological Health
Pooled and Fixed Effects Regression Estimates

	GHQ12 Score			Anxiety		
	(1.) Pooled	(2.) Fixed Effects	(3.) Tobit	(4.) Pooled	(5.) Fixed Effects	(6.) Probit
Base group: very unlikely						
1. Very Likely	1.11**	1.49**	1.89**	0.04**	0.04**	0.04**
	(0.22)	(0.35)	(0.45)	(0.02)	(0.02)	(0.02)
2. Likely	0.69**	0.85**	1.50**	0.04**	0.04**	0.04**
	(0.15)	(0.23)	(0.43)	(0.02)	(0.02)	(0.02)
3. Unlikely	0.15*	0.34**	0.76**	0.01	0.02*	0.01
	(0.08)	(0.12)	(0.21)	(0.01)	(0.01)	(0.01)
Credit commitments:						
4. Very Likely, LTI>2=1	0.23**	0.36**	0.49**	0.04**	0.03**	0.03**
	(0.08)	(0.15)	(0.20)	(0.02)	(0.01)	(0.01)
5. Likely, LTI>2=1	0.32**	0.28**	0.38**	0.03**	0.02**	0.02**
	(0.14)	(0.12)	(0.18)	(0.01)	(0.01)	(0.01)
6. Unlikely, LTI>2=1	0.05	0.10*	0.15**	0.02*	0.01	0.02
	(0.03)	(0.05)	(0.06)	(0.01)	(0.01)	(0.02)
7. LTI>2=1	-0.14*	0.21*	-0.34**	0.01	-0.01	0.01
	(0.07)	(0.11)	(0.12)	(0.01)	(0.01)	(0.01)
Fixed Effects	No	Yes	No	No	Yes	No
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Individuals	7752	7752	7752	7752	7752	7752
Number of Groups	-	4542	-	-	4542	-
Av. Obs. Per Group	-	1.7	-	-	1.7	-
R2 / Pseudo R2	0.04	0.02	0.02	0.02	0.02	0.05
F / LR	10.33	2.25	349.82	5.61	1.71	159.44
Prob > F	0.0000	0.0003	0.0000	0.0000	0.0096	0.0000

Notes: see Table 4