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Mental health, work incapacity and State transfers: an analysis of the British Household Panel Survey

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Abstract

The UK has experienced substantial increases in the number of individuals claiming work incapacity benefit (IB) and the proportion of people claiming IB for mental health reasons. Following high-profile reports claiming that intervention would cost the State nothing, the Government has increased the availability of psychological therapies. The cost-neutrality claim relied on two statistics: the proportion of IB claimants diagnosed with mental and behavioural disorders; and estimates of the costs to the State of periods on IB. These are cross-sectional associations. We subject these two associations to more rigorous longitudinal analysis using nationally representative data from seventeen waves (1991-2007) of the British Household Panel Survey (BHPS). We model the effect of depression on (a) State transfers and (b) the probability of being on IB whilst controlling for covariates and unobservable heterogeneity. Our results reveal that cross-sectional associations with depression are substantially confounded. The estimated effects of becoming depressed on State transfers reduce by 83% and 88%, and on the probability of claiming IB drop to just 0.4 and 0.7 percentage points, for males and females respectively. We conclude that the stated benefits of reducing depression for the State and for labour market participation have been substantially over-estimated.

Key words: Work incapacity, Mental health, Dynamic modelling, Unobserved heterogeneity
JEL Classification: C23, H51, I10, I18

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1. INTRODUCTION

Individuals in the UK who have been unable to work for over 28 weeks because of ill-health are entitled to claim Incapacity Benefit (IB) from the State. The number of people claiming IB has increased by over 300% in 30 years (McVicar and Anyadike-Danes, 2008) and now represents approximately 6.5% of the working-age population. During a period of apparent stability in work incapacity claiming rates over the past decade, the proportion of claimants claiming for reasons of mental health rose from 32% to 45%.

In 2007 the Government committed itself to reducing the number of people claiming IB by 1 million. This target is part of a wider aim by the Government to reach an 80% employment rate by 2016 (Freud, 2007). Mental health and IB claiming have become a growing concern, and something the Government seem dedicated to reduce. In the 2007 Comprehensive Spending Review (H.M Treasury, 2007) the Government committed itself to improving access to psychological therapies for those with depression or anxiety as a Public Service Agreement (PSA) target. The NHS programme, Improving Access to Psychological Therapies (IAPT) [http://www.iapt.nhs.uk/], is the process by which this PSA target will be delivered. Cognitive Behavioural Therapy (CBT) forms a large component of the IAPT programme and has been recommended by the National Institute for Health and Clinical Excellence (NICE) as an effective treatment for depression in 2004 (NICE, 2004 (amended 2007, updated 2009)).

Two IAPT pilot schemes were put into place in 2007/2008. By spring 2010 112 of the 152 Primary Care Trusts were offering some form of CBT (DH, 2008, 2010). By 2010/2011 the objectives are to have: access to some form of CBT in each area (DH, 2010); 900,000 people treated; 3,600 newly trained therapists; and 25,000 fewer sickness benefit claimants (NHS, 2010). Investment for the programme in 2010/2011 is in excess of £173 million.

The high-level commitment to this programme followed influential reports by the Centre for Economic Performance's Mental Health Policy Group at the London School of Economics. In 2006 Layard made the case for expanding the availability of psychological therapies in the British Medical Journal (Layard, 2006). This was supported by a more substantial report (Layard et al., 2006a) and a number of other papers published on the LSE Programme website [http://cep.lse.ac.uk/research/mentalhealth/] including a draft cost-benefit analysis (Layard et al., 2006b).

The case described in the cost-benefit analysis relies on two key statistics: (i) that the proportion of IB claimants diagnosed with mental and behavioural disorders is 40%; and (ii) that the treatment will result in higher contributions to the State Exchequer. The second of these statistics was calculated using predicted tax gains earned in employment minus the benefits previously paid to people with depression on IB. Based on a (one-off) £750 cost per treatment cycle, Layard et al. (2006b) estimated that the treatment would pay for itself within a year. Overall, these findings led Layard et al. (2006b) to suggest that increasing the availability of psychological therapies "**would cost the Exchequer nothing**" (p.1; emphasis in original).

Both findings are cross-sectional associations but are used to predict the effects of *changes* in the level of depression. In this paper we subject these two simple empirical findings to a more rigorous longitudinal analysis. We first estimate the effect of depression on contributions to the Exchequer. We then examine whether becoming depressed affects the probability of claiming IB.

Our first analysis addresses more comprehensively how depression influences the contribution that individuals make to the Exchequer. We use longitudinal data and capture information on contributions made via income tax and National Insurance on earnings and claims made on a wide range of state benefits including IB. To our knowledge this is the first study to model Exchequer contributions using longitudinal data, and the first to model the financial impacts of health conditions on individual contributions to State finances.

Our second analysis assesses the relationship between depression and work incapacity. While there is a wide literature on IB claiming, little has been done that exploits individual-level longitudinal data to model the dynamics of IB claiming. Most studies have been cross-sectional (Disney and Webb, 1991; Nolan and Fitzroy, 2003; McVicar, 2006) or have used aggregate data (typically the DHSS, Molho, 1989, 1991; Holmes and Lynch, 1990; Lynch, 1991). This paper uses longitudinal data that enables us to model changes in IB claiming status as a function of changes in mental health status and a wide range of other covariates.

Another limitation of past studies has been the lack of detailed data on health conditions. Molho (1989, 1991) proxied for health with the claiming of sickness benefits in a study using DHSS data. Disney and Webb (1991) used smoking status as the health measure in a study using the Family Expenditure Survey. Faggio and Nickell (2005) and McVicar and Anyadike-Danes (2008) both used self-reported disability. Two studies have examined the main health reason for claiming IB. Holmes and Lynch (1990) and Lynch (1991) found that the main health reason for claiming IB had a significant effect on off-flows in the 1980s.

Previous studies have not therefore explicitly controlled for any potential confounding of the effects of other health problems. The British Household Panel Survey (BHPS) data we use in this study enables us to control for several health conditions, including problems with arms and legs, sight, hearing, skin, chest, heart and blood, stomach, diabetes, epilepsy, and migraines.

2. DATA

We use the BHPS to model IB, depression, and contributions to the Exchequer for the period 1991-2007. The BHPS was designed as an annual survey of each adult (16+) member of a nationally representative sample of more than 5,000 households. The same individuals are re-interviewed in successive waves and, if they split-off from original households, all adult members of their new households are also interviewed. Children are interviewed once they reach the age of 16. Thus the sample should remain broadly representative of the population of Britain as it changes through time (Taylor et al., 2010).

A number of booster samples have been added to the BHPS (Taylor et al., 2010). In 1997 (Wave 7) a sub-sample of the original United Kingdom European Community Household Panel (UKECHP), comprising all households in Northern Ireland who were still responding to the UKECHP and a low-income sample of the Great Britain panel, was introduced. Funding for this sub-sample ended in 2001 (Wave 11). In 1999 (Wave 9) booster samples of 2,399 individuals in Scotland and 2,191 individuals in Wales were introduced. In 2001 (Wave 11) the Northern Ireland Household Panel Survey added 1,979 households and 3,528 individuals (+ 200 proxy interviews) to the BHPS.

IB is measured using the variable *f125*, which asks respondents: ‘Have you yourself (or jointly with others) since 1st September last year received Incapacity Benefit?’ There are several important points to note here. First, this measure is retrospective. Second, the timing of interviews in the BHPS varies and as such the period covered by the question varies across observations. Third, this measure does not provide information on the number or duration of claim spells.

We are interested in the relationship between mental health and work incapacity, and as such, we restrict our sample to those of working age. As the IB claiming question is retrospective, we include women aged 17-61 years, and men aged 17-66 years at the time of the interview.

Depression is measured using the variable *hlprbi,* which asks respondents: ‘Do you have any of the health problems or disabilities listed on this card…’. One of the listed conditions is ‘Anxiety, depression or bad nerves’. An alternative measure of mental health included in the BHPS is the 12 question version of the General Health Questionnaire (GHQ-12) (Goldberg et al., 1997). We replicate our analysis with the ‘caseness’ definition of this variable, with individuals reporting a score of 4 or more defined as having mental ill-health.

To measure Exchequer contributions, we use data from the income section of the BHPS. Payments to the Exchequer are measured using income tax paid, which is calculated as the difference between gross and net usual monthly pay (variables *paygty* and *paynty,* respectively). To measure payments from the Exchequer, we use the variable *fimnb,* which measures the amount of benefit income an individual received in the last month (jointly received benefits are apportioned equally unless otherwise stated). This contribution measure does not represent total individual payments to the Exchequer as we only have data on employment taxes/National Insurance payments. Income tax and National Insurance accounted for approximately 52% of Public Sector receipts and social benefits accounted for approximately 35% of Public Sector expenditure over the period 1992-2002 (ONS, 2010a). We deflate contributions by the annual Retail Price Index obtained from the Office of National Statistics (ONS, 2010b).

We measure socio-economic group differences using the Registrar General’s Social Class. The manual social class comprises skilled, partly-skilled and unskilled manual workers and the armed forces. Where the individual is unemployed then their last occupation is recorded. If there is no information on the individual’s employment (because they have never worked, say) then we take the head of the household’s occupation status, father’s status, and mother’s status in respective order.

The strength of the local labour market may also have an impact on the probability of claiming IB. Job destruction, where people find themselves out of work, can be measured by the unemployment rate for the area. A high unemployment rate may encourage higher IB claiming rates, and those with health problems may be more likely to transit onto IB once becoming unemployed. This can be described in two ways (Beatty et al., 2000): (i) the redundancy effect, whereby people of poorer health are more likely to be made redundant, and (ii) the benefit shift, whereby people of poorer health are seen as relatively unattractive to employers compared to the healthy unemployed and are persistently sent to the back of the job queue as new waves of people enter unemployment. In both cases, those in poorer health switch to IB as it pays higher than unemployment benefit. To capture variations in the strength of the local labour market, we utilise Local Authority District (LAD) level data on unemployment rates and average wage rates. This information was obtained from the claimant count (ONS, 2010c), and the Annual Survey of Hours and Earnings (ASHE, 2010), via NOMISWEB (NOMISWEB, 2010). LAD identifiers for the BHPS were provided by Data-Archive (BHPS, 2009). Average wage rates are included to proxy the replacement rate of IB rates to local wages – given IB rates are national rates, the average regional wage captures regional differences in the relative generosity of IB payments.

3. METHODS

3.1 Effect of depression on Exchequer contributions

The first stage of our analysis is to test and quantify the effects of depression on contributions to the Exchequer. An individual's net contribution (C_i) to the Exchequer at time t can be estimated as:

$$C_{it} = T_{it} - B_{it} \tag{1}$$

in which T_{it} is taxes paid and B_{it} is state benefits received.

We use pooled OLS to estimate the following equation:

$$C_{it} = \beta_k x_{itk} + v_{it} \tag{2}$$

Where C_{it} is monthly contribution per individual, and x_{itk} is a range of *k* covariates that may affect the amount of contributions made by individuals. These will include factors influencing whether someone is in work (and thus pays taxes) and/or claiming benefits.

To ensure we have reliable estimates, we need to control for potential bias in the model. The first possible source of bias occurs were there to be reverse causality between the dependent variable (contributions) and one of our independent variables. Our primary interest is in the effect of depression. Reverse causality would require depression to be caused by contributions to the Exchequer - we believe this causal pathway is unlikely. The second potential source of bias stems from unobserved heterogeneity; certain individuals may be more or less likely to contribute than others and these unobservable differences may be correlated with other independent variables. To correct for this potential source of bias, we estimate (2) using fixed-effects assuming that the unobserved component is time invariant. Use of fixed-effects also controls for any time-invariant, individual-specific measurement errors:

$$C_{it} = \beta_k x_{itk} + u_i + v_{it} \tag{3}$$

3.2 Effect of depression on IB Claiming

There are two important methodological concerns with modelling IB claiming and depression. First, there are likely to be unobservable individual characteristics that influence whether someone claims IB, including attitudes to health and/or the State. For example, older people are more reluctant to claim off the State (Costigan et al, 1999; Kotecha et al., 1999), which would exert negative bias on the estimated age gradient. These unobserved characteristics are likely to be correlated with the variables in our model. Second, IB claiming is likely to be persistent as claims for ill health may persist for a number of years for those with long-term health conditions. It is important to remove any correlation between the dependent variable and the error term for our estimates to be unbiased.

We follow Wooldridge (2005) in estimating a dynamic probit model with unobserved effects:

$$y_{it} = \beta_0 + \beta_1 z_{it} + \beta_3 y_{it-1} + c_i + u_{it} \tag{4}$$

Here y_{it} is a binary indicator for claiming IB at some point in the next year, y_{it-1} is a binary indicator for whether the individual claimed IB in the last year, and c_i is an individual specific time-invariant error term that we allow to be correlated with z_{it}, a vector of covariates. z_{it} contains dummy variables for other health problems and a range of variables found to be significant predictors for IB claiming in the literature: age, region of residence, education, ethnic group, marital status, number of children, socioeconomic group, area wage and unemployment rates, and wave/year.

z_{it} also contains an indicator for the recall period for the individual. This is the difference in days between the start of the recall period (1st September of the previous year) and the interview date. This controls for the possibility that individuals with longer recall periods have a longer period at which to have been at risk of claiming IB.

We relax the (strong) assumption of zero heterogeneity in three ways, we include an initial condition, y_{i0} which is a binary variable indicating whether individual i reported having claimed IB in their first observation, time averages of the covariates, $\bar{z}_i$, and individual random-effects, a_i:

$$c_i \mid y_{i0}, \bar{z}_i \sim Normal\left(\alpha_0 + \alpha_1 y_{i0} + \bar{z}_i \alpha_2, \sigma_a^2\right) \quad (5)$$

with $c_i = \alpha_0 + \alpha_1 y_{i0} + \bar{z}_i \alpha_2 + a_i$ where $a_i \mid (y_{i0}, \bar{z}_i) \sim Normal\left(0, \sigma_a^2\right)$.

The first additional term, y_{i0}; is included in recognition that our sample is left-truncated, meaning we have little/no information on an individuals' IB claiming history before they enter the survey. y_{i0} is included since the first observation may hold some indication for any unobserved tendency for an individual to claim IB. Our second additional term are $\bar{z}_i$, here we assume that any heterogeneity among individuals that is correlated with the covariates in the model works only through the time averages of the (time varying) covariates in z_{it}, $\bar{z}_i$, thus removing any correlation between the heterogeneity term and z_{it}. The third additional term, a_i, assumes a time-invariant individual-specific random-effects specification.

Substituting (5) into (4) gives:

$$y_{it} = \beta_0 + \beta_1 z_{it} + \beta_2 y_{i0} + \beta_3 y_{t-1} + \beta_4 \bar{z}_i + a_i + u_{it} \quad (6)$$

The difference between this dynamic random-effects model and a standard random-effects probit model is the inclusion of additional terms y_{it-1}, y_{i0} and z_i. It assumes that (i) having conditioned on the covariates and unobserved heterogeneity: z_{it} and c_i, the dynamics are correctly specified as first order, (ii) c_i is additive in the standard normal cumulative distribution function, and (iii) the z_{it} are strictly exogenous.

Following the literature (Molho, 1989, 1991; Holmes and Lynch, 1990; Lynch, 1991; McVicar and Anyadike-Danes, 2008) we estimate separate models for males and females. The models are estimated using *xtprobit, re* in STATA v11.0.

4. RESULTS

4.1 Descriptive statistics

Table I compares the proportion of IB claimants claiming for mental health problems from national administrative data, with the proportions of IB claimants in the BHPS reporting problems with depression and GHQ caseness. While the proportion of IB claimants in the BHPS reporting problems with depression (GHQ caseness) is lower (higher) than national figures, both rates follow similar trends to the national trend.

[Table I. Here]

The initial sample of working age adults is 181,674 person-year observations (27,440 individuals). Use of one period lead values of IB claimant status reduces the sample to 156,513 observations (22,290 individuals). Item non-response on the remaining covariates results in a final sample of 145,125 person-year observations, comprising 69,436 observations for males and 75,689 observations for females (10,354 male individuals and 10,849 female individuals). Our panel is unbalanced and individuals can enter or leave the sample at any wave. When including aggregate LAD variables the sample is restricted to waves 8-17 (1998-2007) and excludes Northern Ireland. This reduces the sample to 82,241 person-year observations (39,446 male observations and 42,795 female observations) and 14,981 individuals (7,266 men, 7,715 women).

Table II provides summary statistics on rates of depression and IB claiming in the next period,. For females there is a higher prevalence of depression than IB claiming. Higher rates of illness than IB claiming is not unusual. Sly et al. (1999) report 3.2 million people were active in the labour market though eligible for IB benefits in 1998/99 (for a discussion on these 'hidden sick' see Beatty et al., 2000).

[Table II. Here]

Approximately 26% of men and 41% of women who claim IB in the next period are depressed. While depression is more prevalent for women, depression appears to have a much stronger effect on claiming IB in the next period for males. Thirty percent of depressed males claim IB in the next period compared with 4% of non-depressed males. The equivalent figures are 17% and 3% for females.

Table III provides average values of the covariates. There is a clear distinction between the prevalence of health conditions amongst males and females. Skin, chest/breathing, migraines, and stomach/liver/kidney problems are all of a higher prevalence in females than males. Males have higher rates of problems related to hearing, heart/blood, and diabetes.

[Table III. Here]

4.2 The effect of depression on Exchequer contributions

The distribution of the variable we have calculated is plotted in Figure 1. Our contribution measure suggests males on average contribute more than females, and as expected, the majority of IB claimants make a negative contribution to the Exchequer.

The results from estimating equation (3) with pooled OLS and fixed-effects models are given in Tables IV and V. In the pooled model the estimated effects of depression on contributions to the Exchequer are -£145 and -£78 for males and females respectively. In a model estimated on the same sample that excludes the other covariates, these coefficients equal -£237 and -£141. Thus, £92 (£63 for females) of the difference in the Exchequer contributions of the depressed and non-depressed is attributable to (a limited range of) observable covariates. The crude difference suffers substantially from omitted variable bias. In a model with only depression and a dummy variable for IB claimant (not shown), the estimate for depression falls from -£237 to -£109 for males (-£141 to -£102 for females). Thus IB claiming is only a partial measure of the impact of depression on contributions to the Exchequer.

The results in the third columns of Tables IV and V control for unobserved heterogeneity. Almost a half, (48.9% for males, 48.2% for females) of the unobserved variation in contributions to the Exchequer is explained by the unobserved heterogeneity term. Tests of the null that the unobserved effects are not significant are rejected (p-values <0.0001) and as such we favour the third set of results obtained from fixed-effects estimation. This model suggests that depression 'costs' the Exchequer £41 per month for depressed males (£17 per month for depressed females). These effects are substantially smaller than the £145 and £78 in the pooled model which implies that individuals who report depression are more likely to have unobservable characteristics that are associated with smaller contributions to the Exchequer.

Our other estimates work in the direction expected. An increased presence of children reduces net State contributions, education increases contributions, and there is a clear business cycle effect (not reported) for males with greater contributions when the economy was growing (negative contributions during the 1992 recession, with contributions increasing from 1994 in the fixed-effects specification). For females we find contributions decrease over the sample period.

[Table IV. Here]

[Table V. Here]

4.3 The effect of depression on IB claiming

The results from multivariate analyses are provided in Tables VI and VII for males and females respectively. The estimates are reported as average marginal effects. In the first column of results being depressed increases the probability of claiming IB in the next wave by 12.4% for males and 7.7% for females. The results in the pooled model suggest a lower but still strongly significant positive effect of reporting depression on the probability of claiming IB in the next wave.

The third sets of results are from the static random-effects specification. The estimated effect of depression is significantly reduced to 1.4% for males (0.6% for females) and suggests there are positive correlations between the unobserved effects and depression. The fourth set of results is from the dynamic random-effects specification, which includes the lagged value of IB claimant status and the initial observed IB status. Both terms are highly significant for both genders and imply persistence in IB claiming.

The fifth set of results are from the full dynamic model including the averages of the time-varying variables (equation (6)). These average values are jointly significant for both sexes. The estimated effect of depression is now reduced from 12.4% to 0.4% for males, and from 7.7% to 0.7% for females. The estimated coefficients on the average depression variable are positive and significant for both genders. Since this controls for any correlation of the unobserved heterogeneity with the time average of depression, we are unable to disentangle the effect of long(er) term depression from unobserved heterogeneity. Controlling for individual specific and time invariant heterogeneity drives the coefficients on the regional, manual, and marital status dummies to insignificance because there is little within-respondent variation in these variables.

[Table VI. Here]

[Table VII. Here]

Table VIII contains the key results from the models estimated over the shorter period (1998-2007) including area wage and unemployment rates. The first panel contains the results from the final models of Tables VI and VII. The second panel of results are where the area rates are included. For comparability, the third panel of results are for models estimated on the smaller sample excluding the area rates. The effect of depression is reduced further to an insignificant 0.1% for males, but the second panel of results reveal that this decline is due to the change in the sample. For females the effect of depression is constant across all three models at 0.7%.

While we find no evidence of a significant effect of local wages, we do find a positive effect of unemployment for males and females.

[Table VIII. Here]

Our interest lies in the effect of depression on the probability of IB claiming in the following year. Table IX gives the key results where we model depression using a binary variable for GHQ caseness. The estimates are essentially the same across the range of models, though we find a slightly smaller impact of GHQ caseness on the probability of claiming IB.

[Table IX. Here]

5. DISCUSSION

In our first analysis, we find depressed males and females have statistically significant reduced contributions to the Exchequer, though this is much smaller once we control for several confounding factors. In our second analysis, we find a positive association between depression and IB claiming but this effect is reduced, though remains significant and positive, when we control for a number of other factors that influence IB claiming.

Making the model dynamic effectively permits past depression to affect the probability of claiming IB. The total effect of depression thus comprises of an immediate effect, or short-run elasticity; given by the estimated coefficient for depression; an average effect, and a long-run elasticity which is the product of recursive effects of past depression. Given the estimates for lagged IB claiming for males and females in our preferred specifications are small (0.0486 and 0.0347), the long-run elasticity is likely to be small – for example, a one period lagged impact of depression would be 0.00019 (=0.0486*0.0040) for males and 0.00023 (=0.0347*0.0067) for females.

One way of interpreting the current depression and average-depression estimates is in a temporal setting. The current depression indicator measures the impact of changes in depression, while the average-depression measure picks up a longer-term propensity to depression. Hauck and Rice (2004) find significant mobility in mental health in the BHPS using the GHQ score suggesting there is enough variation to distinguish between these effects.

Comparing across the health conditions, we find that depression has the largest impact on Exchequer conditions with the exception of epilepsy for females. Depression also had the highest effect on the probability of claiming IB over all other conditions listed for females. For males, however, the effects of arms and leg problems, diabetes, migraine, and other conditions were larger. There are large and significant effects of these other health problems in most models. This suggests that there would be significant confounding were we to exclude these other problems.

We find an increasing probability of claiming IB by age group for both genders. Similar age effects have been found in Molho (1989, 1991) for on-flows, Lynch (1991) and Holmes and Lynch (1990) for reduced off-flows, and Disney and Webb (1991) for IB claiming.

We find no significant effect of area wage rates for either gender, which contrasts with positive effects for on-flows to IB for income and rate of benefit found in Molho (1989) and negative effects of IB rates on off-flows in Holmes and Lynch (1990) and positive effects of replacement rates on IB claiming in Disney and Webb (1991). However, our results show a significant effect of higher unemployment rates on the probability of claiming IB for males. Positive effects of local unemployment rates have been found by Beatty et al (2000) and Disney and Webb (1991), and negative effects for off-flows (Lynch, 1991; Holmes and Lynch, 1990). Insignificant unemployment rates were found in studies for IB on-flows by Molho (1989, 1991).

There are a number of limitations to our analyses. Our measure of contributions to the Exchequer contains only financial transactions, but this is not the only means by which individuals contribute to the Exchequer. Transfers can occur via taxes on spending and there are substantial transfers in the form of state-financed health care provision. While the BHPS does contain some measures of health care utilisation, they are insufficiently detailed to incorporate into the transfers measure. Attrition is likely to be higher amongst individuals with poor health – this has been confirmed in Contoyannis, Jones and Rice (2004) who use the BHPS to analyse health dynamics. This could lead to negative bias on the effect of depression if those attriting were also more likely to claim IB. Attrition however, was found to have an insignificant impact on the estimated determinants of self-reported health in Contoyannis, Jones and Rice (2004).

Nevertheless, our results suggest that univariate cross-sectional associations between depression and work incapacity and State transfers are substantially inaccurate estimates of the causal effects. The estimated effects of becoming depressed on State contributions reduce by 83% and 88%, and on the probability of claiming IB drop to just 0.4 and 0.7 percentage points, for males and females, respectively.

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Tables

Table I. Proportions of Incapacity Benefit claimants with mental health problems

	Administrative data	BHPS rates	BHPS rates
Year	% claims for mental problem	% IB claimants reporting depression as a health problem	% IB claimants with GHQ caseness
1997	31.79	28.06	40.89
1998	33.88	29.59	43.30
1999	35.65	31.48	39.18
2000	37.02	31.09	48.48
2001	38.52	31.54	52.97
2002	39.88	39.04	48.79
2003	41.25	39.83	51.28
2004	42.58	36.91	44.30
2005	43.71	34.83	39.20
2006	44.57	40.10	46.73
2007	45.29	42.23	49.01

Figures are for working-age adults only. Working age is >=16 and <=60 (females) and <=65 (males).
Administrative data from DWP via NOMISWEB (NOMISWEB, 2010) (5% sample of NI records).

Table II. Descriptive statistics for depression and Incapacity Benefit claimant status

	Males		Females	
	(N)	(%)	(N)	(%)
Depressed in the current wave	3,275	4.72	7,256	9.59
Claims IB in next period	3,799	5.47	2,961	3.91
Depressed in the current wave: Claims IB in next period	989	30.20	1,220	16.81
Not Depressed in the current wave: Claims IB in next period	2,810	4.25	1,741	2.54
Claims IB in next period: Depressed at current wave	989	26.03	1,220	41.20
Does not claim IB in next period: Depressed at current wave	2,286	3.48	6,036	8.30

Table III. Descriptive statistics for covariates

	Males		Females	
	(N)	(%)	(N)	(%)
Total	69,436	100.00	75,589	100.00
Ethnic Minority				
No (base)	65,141	93.81	71,076	93.91
Yes	4,295	6.19	4,613	6.09
Age				
16-20 (base)	6,844	9.86	7,347	9.71
21-25	6,481	9.33	7,279	9.62
26-30	7,346	10.58	8,754	11.57
31-35	8,208	11.82	9,895	13.07
36-40	8,283	11.93	9,818	12.97
41-45	7,715	11.11	9,991	11.88
46-50	7,017	10.11	8,314	10.98
51-55	6,501	9.36	7,534	9.95
56-61	6,505	9.37	7,757	10.25
62-66	4,536	6.53	-	-
Children				
None (base)	43,385	62.48	41,877	55.33
1	12,703	18.29	16,663	22.02
2	9,660	13.91	12,278	16.22
3+	3,688	5.31	4,871	6.44
Health Problem				
Arms or legs	14,032	20.21	16,080	21.24
Sight	2,187	3.15	2,365	3.12
Hearing	4,400	6.34	2,688	3.55
Skin	6,486	9.34	11,101	14.67
Chest, breathing	7,519	10.83	8,980	11.86
Heart and blood	6,998	10.08	6,602	8.72
Stomach, liver, kidney	3,949	5.69	5,052	6.67
Diabetes	1,671	2.41	1,173	1.55
Epilepsy	543	0.78	643	0.85
Migraine	3,054	4.40	9,888	13.06
Other	1,847	2.66	3,882	5.13
Marital Status				
Married (base)	39,296	56.59	42,174	55.72
Couple	8,520	12.27	9,390	12.41
Widowed	570	0.82	1,465	1.94
Divorced	2,695	3.88	5,315	7.02
Single	18,355	26.43	17,345	22.92
Region				
London (base)	4,852	6.99	5,313	7.02
South East	10,159	14.63	11,108	14.68
South West	4,894	7.05	5,117	6.76
East Anglia	2,209	3.18	2,279	3.01
East Midlands	4,818	6.94	4,789	6.33
West Midlands	4,599	6.62	4,903	6.48
North West	5,582	8.04	5,987	7.91
Yorks. & Humber.	4,987	7.18	5,386	7.12
North East	3,394	4.89	3,436	4.54
Wales	8,510	12.26	9,227	12.19
Scotland	10,234	14.74	11,533	15.24
Northern Ireland	5,198	7.49	6,611	8.73
Qualifications				
Other (non-degree) (base)	43,194	62.21	47,749	63.09
Degree	9,814	14.13	9,581	12.66
No Qualifications	16,428	23.66	18,359	24.26
Social class				
Non-Manual(base)	45,982	66.22	60,112	79.42
Manual	23,454	33.78	15,577	20.58

Table IV. Regression models of contributions to the Exchequer - males

	Raw		Pooled OLS		Fixed-Effects	
Depressed	-236.54	(6.40)	-144.92	(6.08)	-41.03	(6.82)
Ethnic Minority			-37.26	(5.41)		
Education (base other)						
Degree			137.66	(3.81)	40.09	(15.69)
No Qualifications			-101.47	(3.48)	19.30	(20.51)
Age (base 16-20)						
21-25			6.91	(6.80)	36.80	(7.99)
26-30			53.12	(6.91)	79.83	(10.72)
31-35			92.46	(6.99)	114.98	(13.70)
36-40			122.09	(7.11)	137.42	(16.85)
41-45			136.56	(7.24)	141.69	(20.10)
46-50			123.98	(7.50)	123.14	(23.44)
51-55			108.58	(7.88)	93.92	(26.89)
56-61			71.59	(8.25)	53.02	(30.56)
62-66			-33.61	(9.94)	-50.06	(34.51)
Health Problems						
Arms or legs			-74.35	(3.36)	-13.00	(3.86)
Sight			-90.08	(7.48)	-8.01	(7.88)
Hearing			-12.26	(5.53)	-7.21	(7.23)
Skin			11.73	(4.41)	1.83	(5.38)
Chest, breathing			-46.92	(4.21)	-16.51	(5.92)
Heart and blood			-48.58	(4.73)	-17.02	(5.95)
Stomach, liver, kidney			-53.17	(5.57)	-3.40	(6.22)
Diabetes			-39.67	(8.47)	-21.06	(14.01)
Epilepsy			-133.96	(14.29)	-33.64	(26.69)
Migraine			-32.69	(6.23)	-7.95	(7.39)
Other			-89.03	(8.08)	4.55	(7.91)
Region (base London)						
South East			-1.60	(5.96)	-2.48	(15.59)
South West			-45.56	(6.93)	-26.13	(21.61)
East Anglia			-39.86	(8.74)	-16.32	(26.18)
East Midlands			-65.70	(6.94)	-17.83	(22.84)
West Midlands			-54.57	(7.00)	-44.15	(27.04)
North West			-46.11	(6.71)	-55.94	(26.55)
Yorks. & Humber.			-63.94	(6.92)	-77.49	(26.87)
North East			-79.34	(7.62)	-101.07	(31.52)
Wales			-89.63	(6.28)	-38.57	(27.46)
Scotland			-67.31	(6.01)	-83.83	(30.11)
Northern Ireland			-107.54	(6.90)	35.56	(275.23)
Marital Status (base married)						
Couple			-39.24	(4.14)	2.35	(5.92)
Widowed			-54.71	(16.37)	21.46	(24.16)
Divorced			-110.34	(6.61)	-18.35	(10.09)
Single			-98.17	(4.20)	-18.95	(6.93)
Kids (base none)						
1			-6.56	(3.68)	0.64	(4.19)
2			-20.38	(4.19)	-0.81	(5.16)
3+			-55.66	(5.96)	1.06	(7.75)
Manual class			-97.25	(2.98)	-12.75	(190.92)
LAD unemp. Rate						
LAD wage rate						
Constant	199.47	(1.42)	319.66	(10.40)	185.45	(76.16)
Observations	70,109		70,109		70,109	
Rho					0.4888	
Adjusted R2	0.0191		0.1795		0.4581	

Standard errors in parentheses. Year effects included but not shown. Test of significance of rho rejected p-value<0.0001. Hausman test supports fixed effects against random effects p-value<0.0001

Table V. Regression models of contributions to the Exchequer - females

	Raw		Pooled OLS		Fixed-Effects	
Depressed	-140.50	(3.40)	-77.87	(3.16)	-17.17	(3.70)
Ethnic Minority			11.05	(4.00)		
Education (base other)						
Degree			136.61	(2.77)	80.55	(9.89)
No Qualifications			-68.09	(2.50)	8.83	(13.09)
Age (base 16-20)						
21-25			-36.80	(5.00)	-19.59	(6.10)
26-30			-6.64	(5.01)	-6.27	(8.00)
31-35			17.30	(5.09)	0.94	(10.18)
36-40			34.75	(5.16)	6.71	(12.44)
41-45			34.79	(5.24)	19.98	(14.79)
46-50			35.27	(5.40)	40.85	(17.23)
51-55			9.84	(5.66)	33.20	(19.77)
56-61			-26.90	(5.98)	15.80	(22.36)
Health Problems						
Arms or legs			-49.57	(2.39)	-13.83	(2.87)
Sight			-31.65	(5.35)	-3.24	(5.66)
Hearing			-8.93	(5.02)	0.94	(6.82)
Skin			8.99	(2.63)	-6.21	(3.38)
Chest, breathing			-27.38	(2.90)	-11.37	(4.29)
Heart and blood			-20.08	(3.40)	3.65	(4.27)
Stomach, liver, kidney			-32.76	(3.68)	-13.03	(4.23)
Diabetes			-48.17	(7.38)	-7.12	(12.17)
Epilepsy			-106.19	(9.78)	-64.14	(19.16)
Migraine			-2.94	(2.73)	4.83	(3.43)
Other			-31.58	(4.09)	-8.34	(4.18)
Region (base London)						
South East			-29.18	(4.24)	-44.35	(11.29)
South West			-62.46	(4.99)	61.21	(15.55)
East Anglia			-59.77	(6.32)	-210.88	(20.74)
East Midlands			-62.61	(5.07)	-60.98	(17.23)
West Midlands			-53.99	(5.01)	-48.84	(18.71)
North West			-45.89	(4.79)	-46.53	(18.34)
Yorks. & Humber.			-63.45	(4.90)	-91.07	(19.27)
North East			-66.28	(5.55)	-123.44	(24.22)
Wales			-71.75	(4.47)	-126.15	(21.21)
Scotland			-56.43	(4.25)	-101.65	(21.71)
Northern Ireland			-91.65	(4.80)	9.74	(183.06)
Marital Status (base married)						
Couple			-13.71	(2.97)	-11.05	(4.22)
Widowed			-153.48	(7.18)	-100.02	(12.21)
Divorced			-100.98	(3.58)	-86.03	(5.90)
Single			-58.19	(2.88)	-69.95	(4.65)
Kids (base none)						
1			-129.02	(2.47)	-79.91	(3.00)
2			-181.93	(2.87)	-116.26	(3.74)
3+			-274.61	(4.03)	-152.80	(5.53)
Manual class			-86.55	(2.43)	44.20	(53.18)
LAD unemp. Rate						
LAD wage rate						
Constant	35.94	(1.08)	202.45	(7.37)	114.05	(28.30)
Observations	76,784		76,784		76,784	
Rho					0.4816	
Adjusted R2	0.0218		0.2318		0.4583	

Standard errors in parentheses. Year effects included but not shown. Test of significance of rho rejected p-value<0.0001. Hausman test supports fixed effects against random effects p-value<0.0001

Table VI. Regression models for whether individual claims IB in the next period - males

	Raw		Pooled		Random-Effects		Random-Effects dynamic		Random-Effects dynamic and time averages	
Depressed	0.1236	(0.0027)	0.0654	(0.0022)	0.0142	(0.0014)	0.0161	(0.0016)	0.0040	(0.0019)
IB claim in past year							0.0495	(0.0027)	0.0486	(0.0025)
IB claim in first year							0.0361	(0.0018)	0.0268	(0.0019)
Ethnic Minority			-0.0040	(0.0041)	-0.0011	(0.0025)	-0.0004	(0.0029)	-0.0015	(0.0029)
Recall Period (days)			-0.0001	(0.0000)	0.0000	(0.0000)	0.0000	(0.0000)	0.0000	(0.0000)
Education (base other)										
No Qualifications			0.0132	(0.0017)	0.0069	(0.0013)	0.0049	(0.0014)	-0.0097	(0.0082)
Degree			-0.0415	(0.0040)	-0.0154	(0.0027)	-0.0162	(0.0029)	-0.0032	(0.0085)
Age (base 16-20)										
21-25			0.0231	(0.0052)	0.0099	(0.0022)	0.0075	(0.0030)	0.0089	(0.0038)
26-30			0.0279	(0.0051)	0.0154	(0.0024)	0.0099	(0.0031)	0.0146	(0.0048)
31-35			0.0329	(0.0050)	0.0149	(0.0025)	0.0085	(0.0031)	0.0117	(0.0056)
36-40			0.0383	(0.0049)	0.0178	(0.0026)	0.0124	(0.0031)	0.0179	(0.0064)
41-45			0.0423	(0.0049)	0.0204	(0.0027)	0.0145	(0.0031)	0.0213	(0.0071)
46-50			0.0547	(0.0049)	0.0266	(0.0030)	0.0191	(0.0032)	0.0282	(0.0079)
51-55			0.0619	(0.0050)	0.0308	(0.0032)	0.0228	(0.0033)	0.0350	(0.0087)
56-61			0.0749	(0.0051)	0.0373	(0.0035)	0.0275	(0.0034)	0.0423	(0.0096)
62-66			0.0494	(0.0053)	0.0265	(0.0032)	0.0074	(0.0035)	0.0258	(0.0104)
Health Problems										
Arms or legs			0.0513	(0.0016)	0.0120	(0.0011)	0.0145	(0.0012)	0.0044	(0.0014)
Sight			0.0193	(0.0030)	0.0037	(0.0013)	0.0045	(0.0020)	0.0013	(0.0024)
Hearing			0.0030	(0.0024)	0.0016	(0.0011)	0.0025	(0.0017)	0.0004	(0.0022)
Skin			-0.0034	(0.0026)	-0.0008	(0.0012)	-0.0017	(0.0018)	-0.0003	(0.0022)
Chest, breathing			0.0176	(0.0020)	0.0043	(0.0010)	0.0044	(0.0014)	0.0012	(0.0019)
Heart and blood			0.0351	(0.0019)	0.0072	(0.0011)	0.0077	(0.0014)	-0.0007	(0.0018)
Stomach, liver, kidney			0.0259	(0.0023)	0.0070	(0.0011)	0.0079	(0.0016)	0.0026	(0.0020)
Diabetes			0.0179	(0.0034)	0.0044	(0.0019)	0.0047	(0.0026)	-0.0108	(0.0042)
Epilepsy			0.0536	(0.0059)	0.0119	(0.0035)	0.0101	(0.0046)	-0.0054	(0.0077)

Migraine	0.0161	(0.0029)	0.0066	(0.0014)	0.0069	(0.0020)	0.0054	(0.0024)
Other	0.0523	(0.0030)	0.0110	(0.0015)	0.0153	(0.0021)	0.0068	(0.0023)
Region (base London)								
South East	-0.0004	(0.0043)	0.0012	(0.0029)	-0.0004	(0.0033)	-0.0013	(0.0093)
South West	0.0038	(0.0048)	0.0033	(0.0034)	0.0008	(0.0037)	0.0078	(0.0132)
East Anglia	0.0084	(0.0058)	0.0059	(0.0038)	0.0029	(0.0045)	0.0115	(0.0118)
East Midlands	0.0275	(0.0044)	0.0112	(0.0033)	0.0101	(0.0035)	0.0102	(0.0131)
West Midlands	0.0208	(0.0045)	0.0092	(0.0033)	0.0068	(0.0036)	0.0173	(0.0169)
North West	0.0330	(0.0043)	0.0142	(0.0033)	0.0099	(0.0034)	0.0200	(0.0138)
Yorks. & Humber.	0.0238	(0.0045)	0.0132	(0.0033)	0.0103	(0.0035)	0.0177	(0.0143)
North East	0.0473	(0.0045)	0.0211	(0.0036)	0.0173	(0.0036)	0.0220	(0.0151)
Wales	0.0412	(0.0041)	0.0175	(0.0030)	0.0133	(0.0032)	0.0114	(0.0145)
Scotland	0.0307	(0.0041)	0.0118	(0.0030)	0.0096	(0.0032)	0.0059	(0.0170)
Northern Ireland	0.0472	(0.0046)	0.0172	(0.0032)	0.0152	(0.0035)		
Marital Status (base married)								
Couple	0.0060	(0.0027)	0.0023	(0.0014)	0.0029	(0.0019)	-0.0008	(0.0031)
Widowed	-0.0053	(0.0061)	0.0040	(0.0031)	0.0005	(0.0044)	0.0055	(0.0069)
Divorced	0.0205	(0.0030)	0.0058	(0.0019)	0.0053	(0.0024)	-0.0024	(0.0042)
Single	0.0210	(0.0023)	0.0070	(0.0015)	0.0066	(0.0018)	0.0059	(0.0034)
Year (base 2006)								
1991	0.0366	(0.0044)	0.0119	(0.0019)	0.0119	(0.0027)	0.0110	(0.0037)
1992	0.0361	(0.0045)	0.0124	(0.0019)	0.0129	(0.0027)	0.0119	(0.0036)
1993	0.0351	(0.0046)	0.0112	(0.0019)	0.0099	(0.0028)	0.0090	(0.0036)
1994	0.0403	(0.0045)	0.0134	(0.0019)	0.0148	(0.0027)	0.0137	(0.0034)
1995	0.0309	(0.0047)	0.0092	(0.0019)	0.0063	(0.0029)	0.0051	(0.0035)
1996	0.0207	(0.0047)	0.0068	(0.0018)	0.0056	(0.0029)	0.0050	(0.0033)
1997	0.0201	(0.0044)	0.0059	(0.0017)	0.0029	(0.0027)	0.0019	(0.0032)
1998	0.0188	(0.0045)	0.0054	(0.0017)	0.0037	(0.0027)	0.0028	(0.0031)
1999	0.0272	(0.0040)	0.0085	(0.0016)	0.0088	(0.0025)	0.0076	(0.0028)
2000	0.0169	(0.0043)	0.0041	(0.0016)	0.0008	(0.0026)	-0.0001	(0.0029)
2001	0.0096	(0.0041)	0.0023	(0.0015)	0.0003	(0.0024)	-0.0003	(0.0026)

2002		0.0089	(0.0041)	0.0023	(0.0015)	0.0020	(0.0024)	0.0019	(0.0026)
2003		0.0083	(0.0041)	0.0030	(0.0015)	0.0027	(0.0024)	0.0029	(0.0025)
2004		0.0024	(0.0042)	0.0002	(0.0015)	-0.0024	(0.0025)	-0.0029	(0.0026)
2005		0.0015	(0.0042)	-0.0002	(0.0015)	-0.0015	(0.0025)	-0.0022	(0.0026)
Kids (base none)									
1		0.0003	(0.0024)	-0.0007	(0.0011)	-0.0007	(0.0016)	-0.0018	(0.0020)
2		0.0020	(0.0027)	-0.0012	(0.0013)	-0.0004	(0.0018)	-0.0039	(0.0026)
3+		0.0140	(0.0036)	0.0022	(0.0018)	0.0036	(0.0025)	-0.0027	(0.0036)
Manual class		0.0328	(0.0016)	0.0169	(0.0017)	0.0143	(0.0014)	-0.0159	(0.0263)
Average depression								0.0352	(0.0034)
Observations	69,436	69,436		69,436		69,436		69,436	
Rho				0.6890	(0.0127)	0.3176	(0.0205)	0.3031	(0.0208)
Pseudo-*R2*	0.0746	0.3202		0.4769		0.5500		0.5667	

Standard errors in parentheses
Average marginal effects
Time averages of all other covariates included in model (5) but not reported
Test for joint significance of the averages rejected for model (5) with p-value<0.0001

Table V11. Regression models for whether individual claims IB in the next period - females

	Raw		Pooled		Random-Effects		Random-Effects dynamic		Random-Effects dynamic and time averages	
Depressed	0.0770	(0.0018)	0.0470	(0.0016)	0.0061	(0.0007)	0.0120	(0.0010)	0.0067	(0.0012)
IB claim in past year							0.0334	(0.0023)	0.0347	(0.0022)
IB claim in first year							0.0279	(0.0015)	0.0261	(0.0016)
Ethnic Minority			0.0029	(0.0033)	-0.0004	(0.0011)	0.0002	(0.0021)	0.0000	(0.0023)
Recall Period (days)			-0.0001	(0.0000)	0.0000	(0.0000)	0.0000	(0.0000)	0.0000	(0.0000)
Education (base other, non-degree)										
No Qualifications			0.0086	(0.0016)	0.0013	(0.0006)	0.0024	(0.0011)	-0.0106	(0.0063)
Degree			-0.0124	(0.0025)	-0.0029	(0.0009)	-0.0043	(0.0016)	-0.0021	(0.0046)
Age (base 16-20)										
21-25			0.0160	(0.0050)	0.0041	(0.0010)	0.0057	(0.0023)	0.0062	(0.0031)
26-30			0.0251	(0.0048)	0.0058	(0.0011)	0.0077	(0.0024)	0.0087	(0.0038)
31-35			0.0308	(0.0047)	0.0061	(0.0012)	0.0089	(0.0024)	0.0094	(0.0044)
36-40			0.0382	(0.0046)	0.0075	(0.0013)	0.0104	(0.0024)	0.0123	(0.0049)
41-45			0.0408	(0.0046)	0.0082	(0.0013)	0.0107	(0.0024)	0.0147	(0.0055)
46-50			0.0428	(0.0047)	0.0093	(0.0014)	0.0120	(0.0025)	0.0182	(0.0061)
51-55			0.0482	(0.0047)	0.0111	(0.0015)	0.0137	(0.0025)	0.0225	(0.0067)
56-61			0.0282	(0.0048)	0.0083	(0.0014)	0.0047	(0.0026)	0.0172	(0.0073)
Health Problems										
Arms or legs			0.0414	(0.0014)	0.0046	(0.0006)	0.0096	(0.0009)	0.0030	(0.0011)
Sight			0.0013	(0.0028)	0.0007	(0.0006)	0.0012	(0.0016)	0.0017	(0.0018)
Hearing			0.0011	(0.0028)	0.0002	(0.0007)	0.0001	(0.0017)	-0.0001	(0.0024)
Skin			-0.0031	(0.0018)	0.0000	(0.0004)	-0.0010	(0.0011)	-0.0008	(0.0014)
Chest, breathing			0.0146	(0.0017)	0.0025	(0.0005)	0.0048	(0.0010)	0.0029	(0.0015)
Heart and blood			0.0088	(0.0018)	0.0015	(0.0004)	0.0029	(0.0011)	0.0012	(0.0014)
Stomach, liver, kidney			0.0150	(0.0019)	0.0021	(0.0005)	0.0034	(0.0011)	0.0009	(0.0014)
Diabetes			0.0153	(0.0036)	0.0024	(0.0010)	0.0067	(0.0023)	0.0022	(0.0038)
Epilepsy			0.0024	(0.0053)	0.0040	(0.0015)	0.0032	(0.0033)	0.0045	(0.0060)

Migraine	0.0013	(0.0017)	-0.0001	(0.0004)	-0.0003	(0.0010)	-0.0007	(0.0013)
Other	0.0291	(0.0021)	0.0035	(0.0006)	0.0080	(0.0012)	0.0048	(0.0014)
Region (base London)								
South East	-0.0063	(0.0038)	-0.0003	(0.0012)	-0.0013	(0.0025)	-0.0080	(0.0067)
South West	-0.0054	(0.0045)	0.0005	(0.0015)	0.0022	(0.0029)	-0.0014	(0.0090)
East Anglia	0.0023	(0.0055)	0.0012	(0.0018)	0.0039	(0.0035)	-0.0095	(0.0101)
East Midlands	0.0055	(0.0042)	0.0025	(0.0014)	0.0056	(0.0028)	0.0021	(0.0094)
West Midlands	0.0145	(0.0039)	0.0030	(0.0014)	0.0051	(0.0028)	-0.0019	(0.0107)
North West	0.0307	(0.0037)	0.0060	(0.0014)	0.0108	(0.0026)	0.0019	(0.0092)
Yorks. & Humber.	0.0017	(0.0041)	0.0019	(0.0014)	0.0033	(0.0028)	-0.0077	(0.0105)
North East	0.0363	(0.0039)	0.0081	(0.0016)	0.0123	(0.0028)	0.0102	(0.0130)
Wales	0.0322	(0.0035)	0.0067	(0.0014)	0.0108	(0.0024)	0.0075	(0.0099)
Scotland	0.0283	(0.0035)	0.0052	(0.0013)	0.0094	(0.0024)	0.0039	(0.0104)
Northern Ireland	0.0403	(0.0038)	0.0078	(0.0015)	0.0122	(0.0025)		
Marital Status (base married)								
Couple	0.0072	(0.0023)	0.0006	(0.0006)	0.0007	(0.0013)	-0.0028	(0.0021)
Widowed	-0.0123	(0.0042)	-0.0033	(0.0011)	-0.0072	(0.0027)	-0.0074	(0.0042)
Divorced	0.0120	(0.0020)	0.0022	(0.0006)	0.0044	(0.0013)	-0.0001	(0.0024)
Single	0.0044	(0.0021)	0.0005	(0.0006)	0.0008	(0.0013)	-0.0035	(0.0023)
Year (base 1991)								
1992	0.0113	(0.0039)	0.0024	(0.0008)	0.0037	(0.0020)	0.0056	(0.0029)
1993	0.0102	(0.0040)	0.0022	(0.0008)	0.0037	(0.0020)	0.0056	(0.0029)
1994	0.0061	(0.0041)	0.0014	(0.0008)	0.0016	(0.0021)	0.0032	(0.0028)
1995	0.0100	(0.0040)	0.0021	(0.0008)	0.0037	(0.0021)	0.0054	(0.0027)
1996	0.0048	(0.0041)	0.0011	(0.0008)	0.0007	(0.0021)	0.0021	(0.0027)
1997	0.0019	(0.0040)	0.0010	(0.0008)	0.0014	(0.0021)	0.0029	(0.0026)
1998	-0.0015	(0.0039)	0.0001	(0.0007)	-0.0008	(0.0020)	0.0003	(0.0025)
1999	0.0004	(0.0038)	0.0006	(0.0007)	0.0013	(0.0020)	0.0023	(0.0023)
2000	0.0059	(0.0034)	0.0013	(0.0006)	0.0020	(0.0018)	0.0029	(0.0021)
2001	0.0042	(0.0035)	0.0006	(0.0006)	0.0009	(0.0018)	0.0015	(0.0021)
2002	0.0034	(0.0032)	0.0008	(0.0006)	0.0007	(0.0017)	0.0016	(0.0019)

2003		0.0004	(0.0032)	0.0000	(0.0006)	-0.0007	(0.0017)	0.0001	(0.0019)
2004		0.0022	(0.0032)	0.0005	(0.0006)	0.0013	(0.0016)	0.0020	(0.0018)
2005		0.0002	(0.0033)	0.0000	(0.0006)	-0.0008	(0.0017)	-0.0004	(0.0018)
2006		0.0014	(0.0033)	0.0003	(0.0006)	0.0008	(0.0017)	0.0009	(0.0018)
Kids (base none)									
1		-0.0093	(0.0019)	-0.0012	(0.0004)	-0.0027	(0.0010)	-0.0030	(0.0014)
2		-0.0137	(0.0023)	-0.0023	(0.0006)	-0.0062	(0.0013)	-0.0065	(0.0019)
3+		-0.0208	(0.0034)	-0.0039	(0.0009)	-0.0095	(0.0020)	-0.0125	(0.0029)
Manual class		0.0137	(0.0015)	0.0039	(0.0007)	0.0051	(0.0011)	0.0060	(0.0185)
Average depression								0.0162	(0.0022)
Observations	75,689	75,689		75,689		75,689		75,689	
Rho				0.7139	(0.0116)	0.3705	(0.0218)	0.3716	(0.0228)
Pseudo-r2	0.0882	0.2435		0.4579		0.5257		0.5368	

Standard errors in parentheses
Average marginal effects
Time averages of all other covariates included in model (5) but not reported
Test for joint significance of the averages rejected for model (5) with p-value<0.0001

Table VIII. Regression models containing area wage and unemployment effects

	Random-Effects dynamic and time averages		Random-Effects dynamic and time averages (with area wage and unemployment rates)		Random-Effects dynamic and time averages (area specification sample excluding area rates)	
Males						
Depressed	0.0040	(0.0019)	0.0011	(0.0024)	0.0010	(0.0024)
IB claim past year	0.0486	(0.0025)	0.0529	(0.0039)	0.0531	(0.0039)
Initially IB claim	0.0268	(0.0019)	0.0177	(0.0025)	0.0179	(0.0025)
Area unemp. Rate			0.0019	(0.0006)		
Area wage rate			0.0022	(0.0081)		
Average depression	0.0352	(0.0034)	0.0383	(0.0043)	0.0383	(0.0043)
Observations	69,436		39,644		39,446	
Rho	0.3031	(0.0208)	0.2618	(0.0334)	0.2606	(0.0333)
Pseudo-R2	0.5667		0.5820		0.5814	
Females						
Depressed	0.0067	(0.0012)	0.0067	(0.0017)	0.0067	(0.0017)
IB claim past year	0.0347	(0.0022)	0.0386	(0.0035)	0.0387	(0.0035)
Initially IB claim	0.0261	(0.0016)	0.0209	(0.0022)	0.0209	(0.0022)
Area unemp. Rate			0.0011	(0.0005)		
Area wage rate			0.0077	(0.0069)		
Average depression	0.0162	(0.0022)	0.0204	(0.0030)	0.0205	(0.0030)
Observations	75,689		42,795		42,795	
Rho	0.3716	(0.0228)	0.3648	(0.0351)	0.3631	(0.0350)
Pseudo-R2	0.5368		0.5499		0.5495	

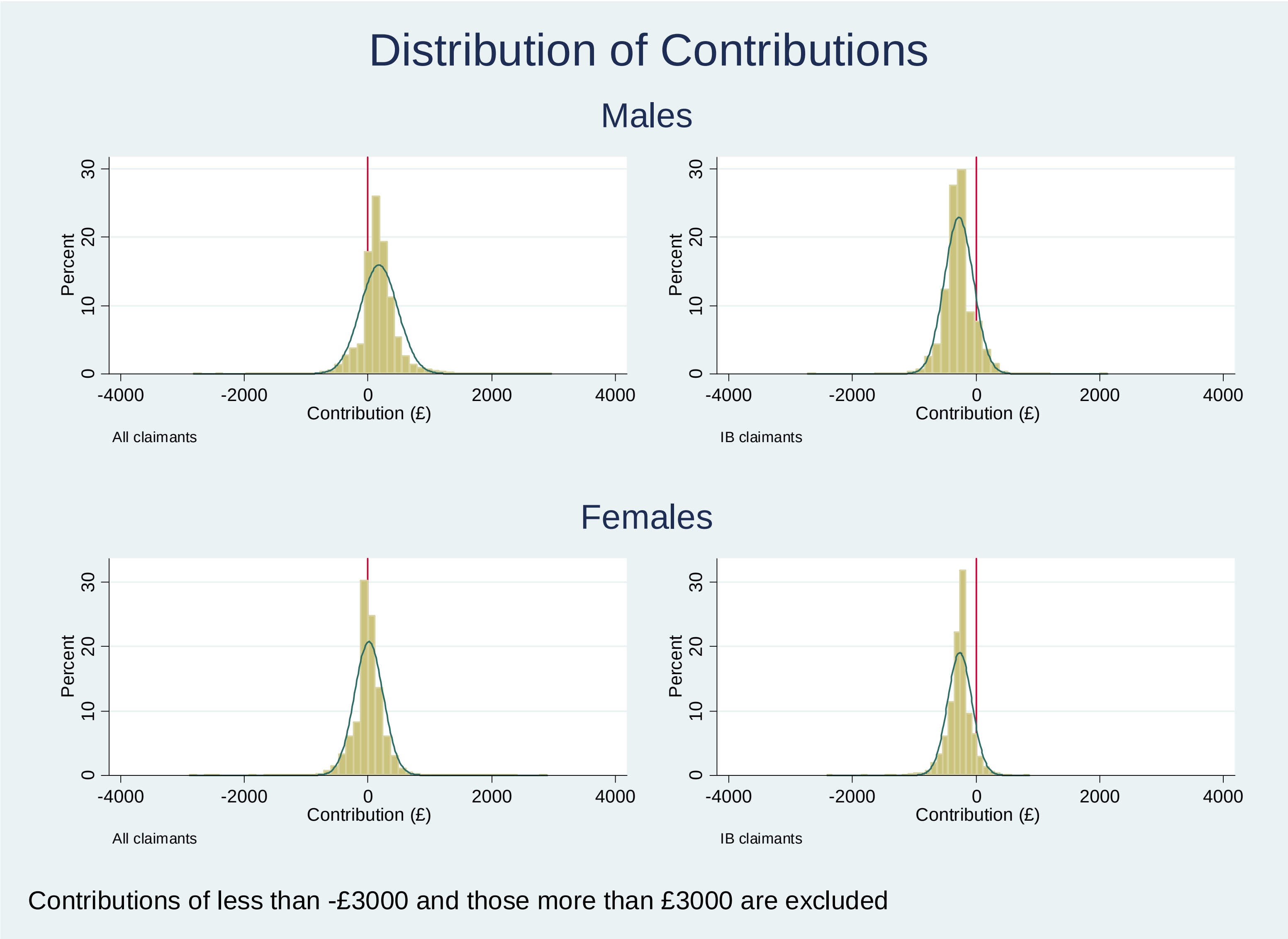
Standard errors in parentheses
Average marginal effects
In addition to the area rates, the same covariates are included as those in the final models of Tables VI and VII but not reported.
Test for joint significance of the averages rejected for all models with p-values<0.0001

Table IX. Regression models with GHQ caseness as the measure of depression

	Health Problems: Depression								GHQ caseness							
	Raw		**Pooled**		**Random-Effects**		**Random-Effects dynamic and time averages**		**Raw**		**Pooled**		**Random-Effects**		**Random-Effects dynamic and time averages**	
Males																
Depressed	0.1236	(0.0027)	0.0654	(0.0022)	0.0142	(0.0014)	0.0040	(0.0019)	0.0689	(0.0020)	0.0378	(0.0017)	0.0090	(0.0009)	0.0041	(0.0013)
Average depression							0.0352	(0.0034)							0.0193	(0.0027)
Observations	69,436		69,436		69,436		69,436		67,874		67,874		67,874		67,874	
Rho					0.6890	(0.0127)	0.3031	(0.0208)					0.6984	(0.0125)	0.3143	(0.0211)
Pseudo-R2	0.0746		0.3202		0.4769		0.5667		0.044		0.311		0.476		0.566	
Females																
Depressed	0.0770	(0.0018)	0.0470	(0.0016)	0.0061	(0.0007)	0.0067	(0.0012)	0.0467	(0.0015)	0.0300	(0.0014)	0.0036	(0.0005)	0.0063	(0.0009)
Average depression							0.0162	(0.0022)							0.0126	(0.0020)
Observations	75,689		75,689		75,689		75,689		74,109		74,109		74,109		74,109	
Rho					0.7139	(0.0116)	0.3716	(0.0228)					0.7224	(0.0112)	0.3702	(0.0229)
Pseudo-R2	0.0882		0.2435		0.4579		0.5368		0.0428		0.2274		0.4540		0.5359	

Standard errors in parentheses
Average marginal effects
Full range of covariates not reported
Test for joint significance of the averages rejected for models (4) and (8) with p-values<0.0001 for both.

Figure 1


Distribution of Contributions
Males
Females
Percent
0
10
20
30
-4000
-2000
0
2000
4000
Contribution (£)
All claimants
IB claimants
Contributions of less than -£3000 and those more than £3000 are excluded