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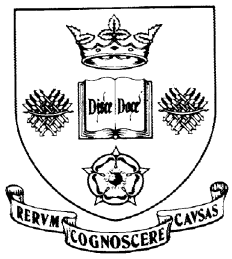

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Abstract: In this paper, we investigate the relationship between social interaction and household finances using data from the British Household Panel Survey. We explore how social interaction influences the probability of holding different types of unsecured debt and assets, as well as how social interaction influences the levels of unsecured debt, financial assets and net worth held. Our findings suggest that social interaction has a positive influence upon the types of financial assets held, which is particularly pronounced for the holding of stocks and shares. Social interaction is also found to influence the amount of financial assets held as well as the level of household net worth. In contrast, there appears to be no clear relationship between social interaction and the holding of unsecured debt, suggesting that social interaction has distinct effects across different parts of the household balance sheet. When we instrument the measure of social interaction, our results once again endorse the finding that social interaction impacts differently on debt and asset holding. Interestingly, in this case, our findings support an inverse association between debt and social interaction.

Key Words: Assets; Debt; Household Finances; Social Interaction.

JEL Classification: D12; D14; D71

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I. Introduction and Background

There is a growing body of empirical literature analysing the implications of social capital and social interaction in the economy. For example, at the microeconomic level, there has been interest in the relationship between social interaction, social capital and socio-economic outcomes such as educational attainment and employment, see, for example, Glaeser et al. (2002) and Brown and Taylor (2009). Whilst at the macroeconomic level, the debate has focused on the relationship between social capital and economic growth (see, for example, Knack and Keefer, 1997, and Algan and Cahuc, 2010). Recent work has conjectured that social interaction and social capital might also influence financial and economic decision-making at the individual or household level focusing on stock market participation.

Such an effect on financial decision-making could potentially occur through word-of-mouth or observational learning (e.g. Banerjee, 1992; Ellison and Fudenburg, 1995), i.e. operating via the diffusion of information relating to, for example, stock market opportunities or how to actually participate in the stock market (Hong et al., 2004). Such channels of learning are arguably particularly relevant in the context of financial assets which are relatively complicated to acquire, such as stocks and shares, in contrast to the relatively more straightforward action of, for example, opening a savings account. Thus, the decision to invest in financial assets, as well as the type of assets to invest in, may be influenced by the decisions of and advice from work colleagues, friends and family. For example, Hong et al. (2004) present evidence supporting a positive association between social interaction and stock market participation in the U.S. with 'social' investors characterised by a higher probability of stock market participation whilst controlling for key demographic and socio-economic characteristics such as wealth and education. Furthermore, this relationship is found to be more pronounced for individuals who reside in communities characterised by higher stock market participation rates. The measures of social interaction relate to church

attendance and interaction with neighbours. Similarly, Ivkovic and Weisbenner (2007) report a positive relationship between a household's stock purchases and those made by neighbours. Brown et al. (2008) explore the influence of community effects in the form of 'word of mouth' communication on stock market participation. They establish a causal link between an individual's decision to own stocks and the average stock market participation of the individual's community. Moreover, the latter result is found to be stronger within more social communities, as measured by whether households are likely to be asked by neighbours for advice. In a similar vein, Guiso et al. (2008) explore the relationship between trust and stock market participation and find that less trusting individuals are less likely to purchase stocks. They argue that their model is consistent with that of Hong et al. (2004), since social individuals exhibit more 'generalised trust', i.e. the trust that an individual has about an unknown individual from a particular community. More recently, Christelis et al. (2010) find that socially active households are more likely to own shares.

The aim of this paper is to explore the implications of social interaction for household financial decision-making from a wider perspective than just stock market participation. To be specific, we explore the relationship between social interaction and a range of financial assets varying from stocks and shares to savings. Given the heterogeneous nature of financial assets in terms of, for example, the associated financial risk and complexity, one might conjecture that the influence of social interaction may vary across the different types of assets. In addition, we explore the relationship between social interaction and household liabilities, namely unsecured debt. It is apparent that social interaction may potentially have implications for household debt: as argued by Georgarakos et al. (2010), more sociable households may be more likely to receive financial support from family or friends if faced with financial difficulties, with such households potentially being able to turn to such informal credit channels. Such possibilities were also noted by Putnam (2000), p.312, in his

comprehensive review of civic life and social capital in the U.S, who states that: “social networks may also provide emotional and financial support for individuals.”

We aim therefore to redress the imbalance in the existing literature on household finances and social interaction by adopting a more holistic view of household finances rather than focusing on one particular aspect, such as stock market participation, which has been the primary focus of the existing literature. In addition, the existing literature has generally focused on stock market participation in the context of the US. To our knowledge, this is the first paper to explore the relationship between social interaction and household finances for the UK, which is surprising in the context of the changes in stock market participation and financial asset holding in the UK over the last three decades with, for example, the widely publicised privatisation of public utilities such as British Telecom (see, for example, Banks and Tanner, 2002). Finally, in contrast to the existing literature, which has generally focused on cross-section data, we exploit panel data which allows us to explore the dynamic aspect to household finances. To be specific, we firstly explore the relationship between social interaction and the types of debt and assets held. We then explore the relationship between social interaction and the amount of debt, assets and net worth held. We therefore conduct comprehensive empirical analysis of the relationship between social interaction and a wide range of aspects of household finances thereby furthering our understanding of the implications of social interaction for financial and economic outcomes.

II. Data and Methodology

Our empirical analysis is based on the British Household Panel Survey (BHPS), a survey conducted by the Institute for Social and Economic Research comprising approximately 10,000 annual individual interviews. For wave one, interviews were carried out during the autumn of 1991. The same households are re-interviewed in successive waves – the latest available being 2008. Detailed information on unsecured debt and asset holding is available

in three waves: 1995, 2000 and 2005. Hence, these three waves are the primary focus of our empirical analysis, which is based on unbalanced panel data.

We adopt two measures of social interaction, SOC_{it}: firstly, a measure based on active club membership; and, secondly, a measure of the frequency at which such activities are undertaken. The first measure of social interaction is based on the responses to a series of questions asking individuals whether they are currently active in a range of clubs/groups, namely: a political party; trade unions; an environmental group; a parents'/school association; a tenants'/residents' group or neighbourhood watch; a religious group or church organisation; a voluntary services group; any other community or civic group; a social club/working mens' club; sports club; womens' institute/townswomen's guild; or any other group or organisation. Our focus on active membership follows Putnam (2000), p.58, who argues that:

> "...formal "card-carrying" membership may not accurately reflect actual involvement in community activities. An individual who "belongs to" half a dozen community groups may actually be active in none. What really matters from the point of view of social capital and civic engagement is not merely nominal membership, but active and involved membership."

Hence, we use the responses to the questions described above in order to proxy the social interaction of the individual by constructing an index of the number of clubs that the individual is currently active in, where the index runs from zero clubs to four plus clubs. Our measure of social interaction based on club membership accords with that frequently used in the existing literature, see, for example, Putnam (2000), Glaeser et al. (2002) and Brown and Taylor (2009). When we adopt this measure of social interaction, the overall sample size across the 1995, 2000 and 2005 waves is 29,259 observations.

The second measure of social interaction is based upon the frequency at which an individual undertakes a number of activities and hence provides a time dimension to the measure of social interaction. Specifically, these activities include: how often they attend

evening classes; local groups; and/or undertake voluntary work, where the potential responses are as follows: never; once a year or less; several times a year; at least once a month; and at least once a week. We group these different types of social interaction into a single index adopting a hybrid combination of the questions by generating an additive scale based upon Cronbach's alpha ranging from 0 to 4, where the scale of reliability for the frequency of social interaction has a value of 0.7. This measure of social interaction thus provides a time dimension to such activities, thereby giving an insight into the intensity of social interaction. The frequency at which an individual undertakes social interaction is entered as a set of dummy variables with 'never' as the omitted category. Using this measure of social interaction, the overall sample size is 19,191 observations.

The Types of Unsecured Debt and Financial Assets Held

In order to explore the relationship between social interaction and the types of unsecured debt and financial assets held, we estimate a series of random effects probit models, where the dependent variable indicates whether or not the individual holds a particular type of debt or asset. For unsecured debt, we distinguish between six types of debt: hire purchase agreements; personal loans from banks, building societies or other financial institutions; credit cards; loans from private individuals; overdrafts; and other debt including catalogue or mail purchase agreements and student loans. With respect to financial assets, we again distinguish between six types, namely: national savings certificates, national savings, building society and insurance bonds; premium bonds;[1] unit/investment trusts; personal equity plans; shares; and other investments, government or company securities.[2]

[1] Premium bonds are a financial product offered by the National Savings and Investments of the UK Government, where, instead of interest payments, investors have the chance to win tax-free prizes. Hence, this type of financial asset is quite distinct from the other assets in terms of its return.

[2] Unfortunately, information regarding the amount held in each debt and asset category is unavailable.

Defining P_{it}^{*} as a continuous unobserved latent dependent variable, such as the utility gained from holding a particular type of debt or asset, and P_{it} as the observed empirical binary counterpart, our probit specifications, which model the type of debt or assets held by individual *i* at time *t*, are defined as follows:

$$P_{it} = 1 \quad if \quad P_{it}^{*} = \boldsymbol{\psi}' \boldsymbol{X}_{it} + \lambda SOC_{it-1} + \varepsilon_{it} > 0$$

$$P_{it} = 0 \quad otherwise \tag{1}$$

where $\boldsymbol{X}_{it}$ denotes a vector of individual and household characteristics, which is described in detail below, SOC_{it-1} denotes our measure of social interaction, as described above, $i=1,\ldots,n$, $t=1,\ldots,T$ and $\varepsilon_{it} = \alpha_i + \nu_{it}$. Our measure of social interaction is lagged since, as argued by Angrist and Pischke (2009), such an approach reduces the potential for reverse causality with social interaction being measured *ex ante*, that is, it predates the outcome variable, i.e. in this case, the type of debt or assets held.[3] We adopt a random effects specification, where the individual specific unobservable effect in the error term is denoted by α_i and ν_{it} is a random error term, i.e. $\nu_{it} \sim IID\left(0, \sigma_{it}^2\right)$. This specification allows for correlation between the error terms of individuals over time, i.e. $\rho = corr\left(\varepsilon_{il}, \varepsilon_{ik}\right) = \sigma_{\alpha}^2 \Big/ \left(\sigma_{\alpha}^2 + \sigma_{\nu}^2\right) \quad l \neq k$.

The Amount of Unsecured Debt, Financial Assets and Net Worth

We then explore the relationship between social interaction and the amount of unsecured debt (d_{it}) and the total value of financial assets (a_{it}) held by the individual at a given point in time. In order to explore the determinants of assets and debt, we treat a_{it} and d_{it} as censored

[3] When the measure of social interaction is defined as the number of clubs that the individual is an active member of, due to data constraints, the matching is as follows: 1994 club membership to 1995 debt or assets; 1999 club membership to 2000 debt or assets; and 2003 club membership to 2005 debt or assets. Similarly, when social interaction is based upon the frequency measure, the matching is as follows: 1998 frequency to 2000 debt or assets and 2004 frequency to 2005 debt or assets.

variables in our econometric analysis since they cannot have negative values. Following Bertaut and Starr-McCluer (2002), we employ a censored regression approach to ascertain the determinants of $\ln(a_{it})$ and $\ln(d_{it})$, which allows for the truncation of the dependent variables.[4] We denote by $\ln(a_{it}^*)$ and $\ln(d_{it}^*)$ the corresponding untruncated latent variables, which theoretically can have negative values. We model $\ln(a_{it})$ and $\ln(d_{it})$ via a random effects tobit specification for each dependent variable as follows:

$$\ln(d_{it}^*) = \boldsymbol{\beta}_1' \boldsymbol{X}_{it} + \gamma_1 SOC_{it-1} + \varepsilon_{it_1} \tag{2}$$

$$\ln(d_{it}) = \ln(d_{it}^*) \quad if \quad \ln(d_{it}^*) > 0 \tag{3}$$

$$\ln(d_{it}) = 0 \quad otherwise \tag{4}$$

$$\ln(a_{it}^*) = \boldsymbol{\beta}_2' \boldsymbol{X}_{it} + \gamma_2 SOC_{it-1} + \varepsilon_{it_2} \tag{5}$$

$$\ln(a_{it}) = \ln(a_{it}^*) \quad if \quad \ln(a_{it}^*) > 0 \tag{6}$$

$$\ln(a_{it}) = 0 \quad otherwise \tag{7}$$

where the debts (assets) of individual *i* at time *t* are given by d_{it} (a_{it}) such that *i*=1,…,*n* and *t*=1,…,*T*, $\boldsymbol{X}_{it}$ denotes a vector of individual and household characteristics, SOC_{it-1} denotes lagged social interaction and ε_{it_1} and ε_{it_2} are the stochastic disturbance terms. In both equations, as above, the structure of the error terms is given as follows: $\varepsilon_{it} = \alpha_i + \eta_{it}$, where α_i is an individual specific unobservable effect, and η_{it} is a random error term, $\eta_{it} \sim IID(0, \sigma_{it}^2)$.

[4] In order to deal with the zero values of unsecured debt and financial assets, we add one to each series.

We then explore the relationship between net worth and social interaction. As argued by Barwell et al. (2006), the overall state of a household's balance sheet is determined by their net worth, i.e. the relative size of their assets and liabilities. Thus, we combine the level of assets and debts at the household level to measure the household's net worth: the difference between total household financial assets and total debt.[5] We conduct panel random effects analysis of the determinants of log net worth, $\ln\left(nw_{it}\right)$, as follows:

$$\ln\left(nw_{ht}\right) = \boldsymbol{\pi}' \boldsymbol{X}_{ht} + \theta SOC_{ht-1} + \varepsilon_{ht} \tag{8}$$

where $\ln\left(nw_{ht}\right) = \ln\left(a_{ht} - d_{ht}\right)$ if $\left(a_{ht} - d_{ht}\right) > 0$; $\ln\left(nw_{ht}\right) = (-1)\ln\left(\left|a_{ht} - d_{ht}\right|\right)$ if $\left(a_{ht} - d_{ht}\right) < 0$, otherwise $\ln\left(nw_{ht}\right)$ is set to zero since there are no values of $\left(a_{ht} - d_{ht}\right)$ between zero and unity. The number of observations for this part of the analysis falls to 15,002 for the club membership measure of social interaction and 9,788 for the frequency measure since the analysis is conducted at the household level given that net worth is generally regarded as a household level concept. Hence, the measures of social interaction included in equation (8) above relate to the head of household, *h*. Once again, the error structure allows for correlation over time: specifically, $\varepsilon_{ht} = \alpha_h + \eta_{ht}$ where α_h is a head of household specific unobservable effect and η_{ht} is a random error term, $\eta_{ht} \sim IID\left(0, \sigma_{ht}^2\right)$.

The control variables included in the matrix $\boldsymbol{X}$ are the same in each of the models estimated. The matrix $\boldsymbol{X}$ includes: age binary controls for whether the individual is aged 18 to 24, aged 25 to 34, aged 35 to 44, aged 45-54 (where aged 55 and above is the omitted category); a male dummy variable; a dummy variable for whether the individual is married or cohabiting; a binary indicator for whether the individual is white; the natural logarithm of labour income; the natural logarithm of other income; binary controls for housing tenure,

[5] Following the standard approach in the existing literature, in order to measure household net worth, we include the value of property in the definition of financial assets and mortgage debt in household liabilities.

specifically whether the home is owned outright, owned on a mortgage, or rented (other tenure status is the omitted category); binary controls for employment status, specifically whether the individual is an employee, self-employed or unemployed (retired, full time student, maternity leave and government training form the omitted category); the number of children and the number of adults in the household; a binary control for whether the individual is in good or excellent health (poor health is the reference group); and, finally, the highest level of educational attainment, distinguishing between degree level, nursing or teaching qualifications, Advanced (A) levels, General Certificate of Secondary Education GCSEs),[6] other educational qualifications and no educational qualifications (the omitted category).

For the two estimation samples, Table 1A provides summary statistics for each of the dependent variables modelled, Table 1B presents summary statistics for the alternative measures of social interaction and in Table 1C summary statistics relating to the variables in $\boldsymbol{X}$ are shown. All monetary variables are deflated to 1991 prices. Figures 1 and 2 present distributional plots of unsecured debt and financial assets, respectively, for 1995, 2000 and 2005. Whilst there appears to have been no shift in the distribution of financial assets over time, the distribution and mean of unsecured debt has shifted to the right, with individuals holding higher levels of debt over the time period. Finally, around 30% (24%) of individuals are active members of one club (undertake social interaction once a year or less), but the proportion of individuals undertaking social interaction decreases monotonically as the intensity increases (see Table 1B).

[6] GCSE level qualifications are taken after eleven years of formal compulsory schooling and approximate to the U.S. honours high school curriculum. The A level qualification is a public examination taken by 18 year olds over a two year period studying between one to four subjects and is the main determinant of eligibility for entry to higher education in the UK.

III. Results

The Types of Unsecured Debt and Financial Assets Held

Table 2 presents the results of estimating equation (1) relating to the determinants of the probability of holding debt and the likelihood of holding particular types of debt. Across the different types of debt, a positive correlation in the unobserved effects is found over time highlighting the importance of the panel element of the data, although for those holding an overdraft this effect is small and statistically insignificant, which may reflect the temporary nature of this type of debt.

Turning briefly to the covariates in $\boldsymbol{X}$, being aged 25 to 34 increases the probability of being in debt by around 20 percentage points compared to those aged 55 and over. The influence of life cycle effects is also evident across the different types of debt. For example, being aged 25 to 34 increases the probability of holding a personal loan by 9.9 percentage points but this effect falls to 0.6 percentage points in the case of borrowing from a private individual (compared to those aged 55 and above). Housing tenure has a large influence upon the likelihood of holding debt, where owning a home outright lowers the probability of being in debt by approximately 19 percentage points. Both employees and the self-employed are about 8 percentage points less likely to be in debt compared to the reference category, whereas labour income and income from other sources both increase the probability of being in debt. However, employment status has a statistically insignificant effect in the case of hire purchase and credit card debt. Furthermore, employment status does not always have the same direction of influence across the different types of debt. For example, being an employee increases (decreases) the probability of having a personal loan (overdraft) by 3.4 percentage points. Such findings highlight the heterogeneity across the different types of unsecured debt. Education has a positive influence on the probability of holding debt with the largest influence coming from having a degree. The role of household composition, on the

other hand, is somewhat mixed. The number of children and the number of adults in the household both increase the probability of being in debt, but have no role in explaining the likelihood of having a personal loan, a loan from a private individual or an overdraft. Finally, those individuals in good or excellent health have a lower probability of holding unsecured debt.

Turning now to the focus of our analysis, the role of social interaction is investigated by employing a set of binary controls for the number of clubs of which the individual is an active member (see Table 2) and a set of binary controls for the frequency of social interaction (see Table 4 Panel A, where, for brevity, the results are summarised). It is apparent that there is no clear effect from either measure of social interaction on the probability of being in debt or on the probability of holding a particular type of debt. For example, there is no evidence of monotonicity: *a priori*, one might expect the intensity of social interaction to matter and, hence, a monotonic relationship to manifest in terms of the magnitudes of the marginal effects. The effect of social interaction, however, is often statistically insignificant, especially at the higher levels of intensity. In addition, there appears to be no clear pattern with respect to the direction of influence of social interaction on unsecured debt. For example, active club membership, where statistically significant, has a positive influence upon the probability of holding debt (see Table 2), yet, in comparison, the frequency of social interaction has a mixed effect, see Table 4 Panel A. Specifically, undertaking social interaction once a year or less (at least once a week) increases (decreases) the probability of holding debt by 1.2 (12) percentage points in comparison to never undertaking social interaction.

Turning to financial assets, the results of estimating equation (1) relating to the determinants of the probability of holding financial assets and the likelihood of holding particular types of financial assets are shown in Table 3. There are clear life cycle effects,

with those aged 18 to 24 approximately 16 percentage points less likely to hold financial assets than those aged over 54. This effect is particularly heightened for premium bonds, personal equity plans and company shares, where individuals aged 18 to 24 have around a 9 percentage points lower probability of holding such assets (in comparison to the reference group). Those individuals who are married, white, in good/excellent health, own their home either outright or with a mortgage and have some educational qualifications are more likely to own financial assets. The largest influence stems from educational attainment, which has a monotonic effect on the probability of owning financial assets: for example, an individual with a degree has around a 20 percentage points higher probability of owning assets compared to an individual with no qualifications. In terms of the type of financial assets held, the effects of education are particularly pronounced for premium bonds, personal equity plans and shares.

With respect to the role of social interaction, in contrast to the case of unsecured debt, there is evidence of monotonicity. For example, focusing upon club membership, being a member of one club (compared to no clubs) increases the probability of holding financial assets by 2.9 percentage points, whereas, for those individuals who are members of four or more clubs, the probability of owning financial assets increases by over 11 percentage points. Evidence that the extent of club membership matters is also evident across the different types of financial assets, with the exception of national savings, where the largest effects are found for owning shares – arguably the riskiest and most complex type of asset to hold. Table 4 Panel B presents the results of estimating equation (1) based upon the alternative measure of social interaction, i.e. the frequency measure. Clearly, the frequency of social interaction has a positive influence on the likelihood of holding financial assets *per se* as well as across the different types of financial assets. However, in contrast to club membership, there is no evidence of the frequency of social interaction having a monotonic influence as the intensity

increases. The only exception relates to share ownership, where undertaking social interaction once a year or less (at least once a month) increases the likelihood of owning shares by 1.4 (2.8) percentage points. The positive effect of social interaction on share ownership is consistent with the findings in the existing literature, see, for example, Hong et al. (2004) and Christelis et al. (2010).

The Amount of Unsecured Debt, Financial Assets and Net Worth

In this section, we explore the relationship between social interaction and the amount of unsecured debt and financial assets held by estimating equations (2) to (4) and equations (5) to (7), respectively, where the dependent variables are truncated as discussed in Section II above. We also investigate the relationship between social interaction and household net worth, i.e. the difference between household financial assets and liabilities, by estimating equation (8), where net worth is treated as a continuous variable. To allow for the panel nature of the data, random effects specifications are estimated throughout. The results are presented in Table 5, where there is clear evidence of positive intra-correlation in the unobserved effects over time.

Focusing initially on the determinants of unsecured debt, as shown in the first and fourth columns of Table 5 for the club membership and frequency measures, respectively, it is apparent that life cycle effects are evident. For example, individuals aged 25 to 34 (followed by those aged 18 to 24) have the highest levels of unsecured debt. For the active club membership measure of social interaction, the expected value function of truncated logged unsecured debt, when all covariates, including the dummy variables, are equal to 0 (in the reference categories), is evaluated as follows:

$$E\left\{\ln\left(d_{it}\right)\middle|\boldsymbol{X}_{it}=0, SOC_{it-1}=0\right\}=\Phi\left(\beta_0/\sigma\right)\beta_0+\sigma\phi\left(\beta_0/\sigma\right)$$

which has the value of 1.961, i.e.

$$E\left\{\ln\left(d_{it}\right)\middle|\boldsymbol{X}_{it}=0, SOC_{it-1}=0\right\}=$$
$$\left[\Phi\left(-8.486/6.182\right)\times -8.486\right]+\left[6.182\times\phi\left(-8.486/6.182\right)\right]$$

where ϕ and Φ denote the density and cumulative distributions of the standard normal distribution, β_0 is the (unscaled) intercept and σ is the standard error of the regression. Hence, log unsecured debt is 1.961 for the aged over 54 group as compared to 1.961+3.548=5.51 for the aged 25 to 34 group. Hence, individuals aged 25 to 34 hold nearly three times (5.51/1.96=2.81) as much unsecured debt as individuals in the oldest age category. Based upon the average value of unsecured debt (see Table 1A), this implies a level of unsecured debt of £5,707 for those aged 25 to 34 as compared to £2,031 for those aged over 54. Turning briefly to the other covariates in $\boldsymbol{X}$, the level of unsecured debt is increasing in both labour income and other income sources. As compared to individuals reporting poor health, those who report good or excellent health have lower levels of unsecured debt, which is also the case for employed and self-employed individuals.

In accordance with the findings related to debt holding, for both measures of social interaction, the influence of social interaction on the level of unsecured debt is found to be ambiguous. For example, being an active member of one or two clubs has a positive and significant influence on unsecured debt, yet club membership appears to have no influence beyond membership of two clubs. Furthermore, the frequency measure is largely statistically insignificant throughout and, where significant, has a negative effect. Turning to the level of financial assets, where the results are shown in the second and fifth columns of Table 5, the importance of social interaction for this aspect of finances is once again evident. Thus, social interaction appears to influence the amount of assets held as well as financial asset holding *per se*. The findings support a monotonic relationship between active club membership and the level of financial assets. For example, evaluating the expected value function of truncated

logged financial assets, when all covariates, including the dummy variables, are equal to 0 (in the reference categories), the log amount of financial assets is given as:

$$E\left\{\ln\left(a_{it}\right)\middle|\boldsymbol{X}_{it}=0, SOC_{it-1}=0\right\}=$$
$$\left[\Phi\left(-15.926/7.043\right)\times -15.926\right]+\left[7.043\times\phi\left(-15.926/7.043\right)\right]=1.218$$

Hence, the log level of financial assets is 1.218 for those individuals who are not members of any club as compared to 1.218+3.302=4.52 for those who are members of four or more clubs. Hence, individuals who are active members of four or more clubs have nearly four times (4.52/1.22=3.70) the level of financial assets as compared to those who are not active members of any club. Evaluated at the mean, this implies financial assets of £12,506 as compared to £3,380.

Covariates in $\boldsymbol{X}$, which have positive effects on the level of financial assets held by individuals, are income, being male, marital status, owning the home outright, being in good or excellent health and educational attainment. As in the case of unsecured debt, life cycle effects are evident where the level of financial assets is increasing in age, which accords with the findings of Brown and Taylor (2008). Interestingly, being employed or self-employed is associated with holding a lower level of financial assets as compared to the reference category (which includes retirees). Such effects were also apparent when modelling the level of unsecured debt.[7]

The third and sixth columns of Table 5 report the results from modelling the level of household net worth, i.e. equation (8). Life cycle effects are once again evident with households with heads aged 18 to 24 having the lowest levels of net worth as compared to households with heads aged over 54. Households with male heads have lower levels of net worth as is the case for households with white or unemployed heads. The association between

[7] We have also jointly modelled the level of unsecured debt and the level of financial assets as a bivariate tobit model, which allows for correlation between the two equations. The results are in line with those reported herein and are available upon request.

labour income and net worth is found to be inelastic as is the association between other income sources and net worth. For example, a one percent increase in income from sources other than paid employment is associated with around a 0.1 percent increase in net worth. As in the case of the level of unsecured debt and the level of financial assets, the level of net worth is monotonically increasing in educational attainment. Where statistically significant, the number of clubs that the head of household belongs to is positively and monotonically associated with net worth. The pattern is less clear when the frequency measure of social interaction is employed, although the influence is positive when statistically significant.

Robustness

In order to explore the robustness of our findings, we repeat the analysis presented in Tables 2 to 5 instrumenting the measure of social interaction. Given that the selection of instruments is always subject to debate, we explore two different instruments. Firstly, in order to allow for neighbourhood effects, we use the average rate of social interaction in the local authority district that the individual resides in. Secondly, following Agarwal et al (2011), who argue that mobility weakens an individual's investment in social capital as well as their social connections, we use a measure of the individual's geographical mobility, i.e. the number of years they have resided in their current home. The Wald-test for the significance of the instruments in the first-stage regression shows that they are strongly significant and endorses the validity of the chosen instruments. The results are summarised in Tables 6 and 7, where, for brevity, we only present the marginal effects relating to the social interaction variables.[8]

It is apparent from Table 6 Panel A that, once we instrument the club membership measure, a statistically significant inverse effect of social interaction is found for the probability of having debt, the probability of credit card debt, the probability of having an

[8] The standard errors have been adjusted to allow for the inclusion of the predicted variables. It should also be noted that the estimated coefficients of the predicted allowance and hours variables might be inconsistent, see Wooldridge (2010). However, we are primarily concerned with only the sign and the significance of the effect in order to ascertain the robustness of our previous results.

overdraft and the probability of having other types of debt. Such findings further highlight the extent to which social interaction has distinct influences across different aspects of household finances, with positive statistically significant marginal effects for social interaction found across all financial asset categories (see Table 6 Panel B), which is consistent with and, hence, endorses our earlier findings. A similar pattern of results is apparent in Table 6 Panels C and D for the frequency measure, although, it is interesting to note that the positive effects related to social interaction and financial asset holding are less pronounced in this case. In Table 7, it is apparent that club membership is inversely (positively) associated with the amount of debt (assets) held. The inverse association between debt and social interaction is also apparent for the frequency measure, although the effect of social interaction on financial asset holding fails to reach statistical significance here. Overall, our empirical results based on instrumenting social interaction lend further support to our finding that social interaction has distinct influences on different aspects of household finances.

IV. Conclusion

We have contributed to the growing body of empirical literature analysing the implications of social interaction in the economy, focusing on its role in financial and economic decision-making. To be specific, we have explored the relationship between social interaction and a range of financial assets varying from stocks and shares to savings, as well as the relationship between social interaction and different types of unsecured debt, thereby redressing the imbalance in the existing literature, which has focused predominantly on stock market participation. Our comprehensive empirical analysis of the relationship between social interaction and a wide range of aspects of household finances has served to further our understanding of the implications of social interaction for financial and economic outcomes.

Our findings suggest that social interaction has a positive influence upon the types of financial assets held, which is particularly pronounced for the holding of stocks and shares.

Social interaction is also found to influence the amount of financial assets held as well as the level of household net worth. In contrast, there appears to be no clear relationship between social interaction and the holding of unsecured debt, suggesting that social interaction has distinct effects across different parts of the household balance sheet. Once we instrument for social interaction, however, an inverse association between debt and social interaction is found, which suggests that a relationship may exist between social interaction and financial problems. Indeed, Putnam (2000), p.193, comments that: "people with lower incomes and those who feel financially strapped are much less engaged in all forms of social and community life than those who are better off .... Even social activities with little or no financial cost are inhibited by financial distress." Such arguments predict an inverse association between financial distress and social interaction, which has implications for the phenomenon of social exclusion, and, hence, highlight the importance of conducting further research in this area.

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FIGURE 1: Log Unsecured Debt, $\ln(d_{it})>0$

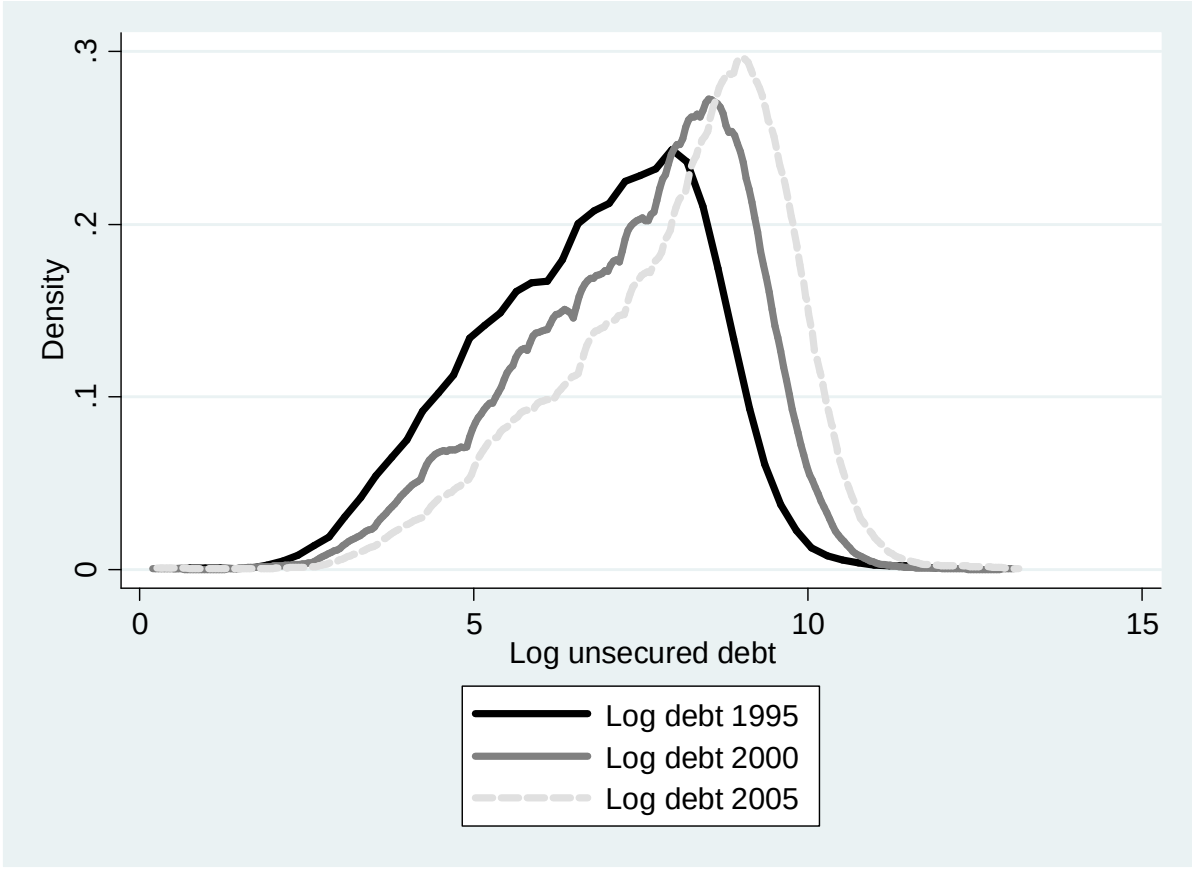

FIGURE 2: Log Financial Assets, $\ln(a_{it}) > 0$

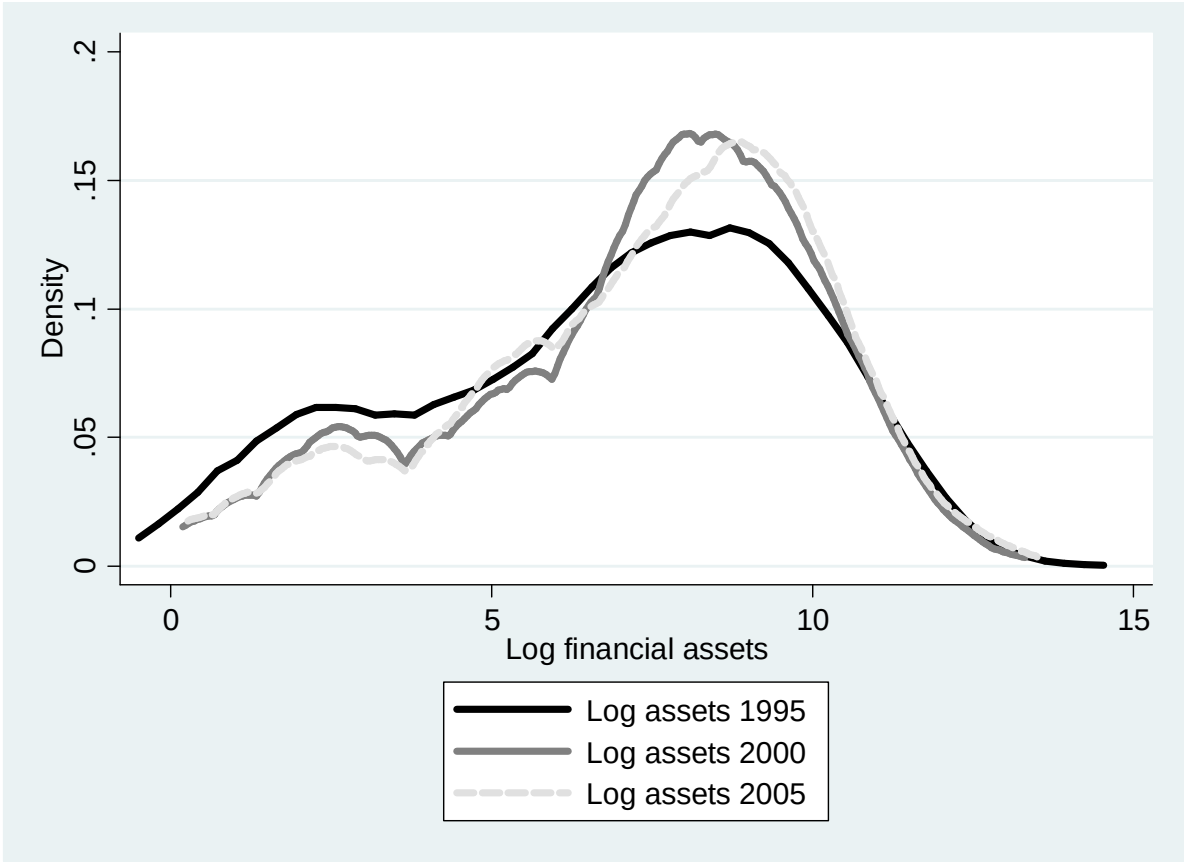

TABLE 1A: Summary Statistics – Dependent Variables

	Club Membership		Frequency	
AMOUNT	MEAN	*STD.*	MEAN	*STD.*
Log unsecured debt	2.919	*3.786*	2.972	*3.904*
Unsecured debt £ (1991 prices)	£2,031	*£7,910*	£2,491	*£9,334*
Log financial assets	1.639	*3.111*	1.596	*3.287*
Financial assets £ (1991 prices)	£3,380	*£21,673*	£3,278	*£20,898*
Log net worth	7.334	*6.965*	7.777	*6.964*
Net worth £ (1991 prices)	£94,919	*£165,726*	£121,390	*£193,799*
TYPE OF DEBT [0/1]				
Hire purchase	0.105	*0.306*	0.093	*0.291*
Personal loan	0.177	*0.382*	0.178	*0.382*
Credit card	0.171	*0.377*	0.170	*0.376*
Private individual	0.012	*0.110*	0.011	*0.105*
Overdraft	0.048	*0.213*	0.065	*0.246*
Other debt	0.123	*0.329*	0.122	*0.328*
TYPE OF FINANCIAL ASSET [0/1]				
National savings	0.019	*0.138*	0.014	*0.116*
Premium bonds	0.158	*0.364*	0.148	*0.355*
Unit trusts	0.054	*0.226*	0.054	*0.225*
Personal equity plans	0.093	*0.291*	0.100	*0.301*
Shares	0.149	*0.356*	0.142	*0.349*
Other investments	0.058	*0.233*	0.036	*0.187*
OBSERVATIONS	29,259		19,191	

TABLE 1B: Summary Statistics – Control Variables: Social Interaction

	MEAN	*STD.*	MEAN	*STD.*
0 Clubs (*t-1*)	0.566	*0.496*	–	
1 Club (*t-1*)	0.297	*0.457*	–	
2 Clubs (*t-1*)	0.097	*0.296*	–	
3 Clubs (*t-1*)	0.030	*0.172*	–	
4+ Clubs (*t-1*)	0.010	*0.101*	–	
Never (*t-1*)	–		0.610	*0.488*
Once a year or less (*t-1*)	–		0.242	*0.428*
Several times a year (*t-1*)	–		0.084	*0.277*
At least once a month (*t-1*)	–		0.050	*0.219*
At least once a week (*t-1*)	–		0.014	*0.117*
OBSERVATIONS	29,259		19,191	

TABLE 1C: Summary Statistics – Control Variables: Other Covariates

	Club Membership		Frequency	
	MEAN	*STD.*	MEAN	*STD.*
Aged 18-24	0.128	0.125	0.125	*0.330*
Aged 25-34	0.221	*0.415*	0.212	*0.409*
Aged 35-44	0.250	*0.433*	0.257	*0.437*
Aged 45-54	0.215	*0.411*	0.213	*0.409*
Aged 55 and above[§]	0.186	*0.369*	0.193	*0.395*
Male	0.535	*0.499*	0.538	*0.498*
Married	0.585	*0.493*	0.569	*0.495*
White	0.913	*0.282*	0.885	*0.319*
Log labour income	6.661	*1.791*	6.726	*1.926*
Log other income	4.988	*3.381*	5.107	*3.428*
Own outright	0.198	*0.399*	0.209	*0.407*
Mortgage	0.548	*0.498*	0.547	*0.498*
Rent	0.122	*0.327*	0.111	*0.315*
Other housing tenure[§]	0.132	*0.338*	0.133	*0.340*
Employee	0.622	*0.485*	0.634	*0.482*
Self employed	0.085	*0.280*	0.085	*0.278*
Unemployed	0.041	*0.197*	0.035	*0.184*
Other employment status[§]	0.252	*0.434*	0.246	*0.431*
Number of (#) Children	0.667	*1.011*	0.661	*1.007*
Number of (#) Adults	2.364	*1.042*	2.384	*1.068*
Good/Ex. Health	0.720	*0.449*	0.718	*0.450*
Degree	0.135	*0.342*	0.146	*0.353*
Teaching/Nurse	0.265	*0.441*	0.286	*0.452*
A level	0.127	*0.333*	0.125	*0.331*
O level	0.177	*0.381*	0.165	*0.371*
Other qualification	0.076	*0.265*	0.070	*0.256*
No educational qualification[§]	0.222	*0.414*	0.208	*0.405*
OBSERVATIONS	29,259		19,191	

Note: [§] denotes reference category.

TABLE 2: Random Effects Probit Analysis – Type of Debt and Club Membership

	PROB. OF HAVING DEBT		HIRE PURCHASE		PERSONAL LOAN		CREDIT CARD		PRIVATE INDIVIDUAL		OVERDRAFT		OTHER DEBT	
	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT
1 Club (*t-1*)	0.019	*2.51*	0.001	*0.25*	0.010	*1.94*	0.009	*1.95*	-0.001	*0.97*	0.001	*0.45*	-0.001	*0.26*
2 Clubs (*t-1*)	0.030	*2.67*	0.010	*1.94*	0.009	*1.14*	0.025	*3.53*	-0.001	*1.20*	-0.008	*1.83*	-0.012	*2.07*
3 Clubs (*t-1*)	0.017	*0.89*	0.016	*1.87*	0.022	*1.75*	-0.005	*0.43*	-0.000	*0.02*	-0.012	*1.54*	-0.028	*2.61*
4+ Clubs (*t-1*)	0.028	*0.85*	0.006	*0.38*	0.008	*0.38*	0.002	*0.11*	0.000	*0.03*	-0.024	*1.61*	-0.057	*2.70*
Aged 18-24	0.205	*13.09*	0.009	*1.12*	0.059	*5.46*	0.022	*2.07*	0.007	*3.32*	0.062	*10.46*	0.082	*10.28*
Aged 25-34	0.209	*15.94*	0.047	*7.21*	0.099	*10.92*	0.060	*6.93*	0.006	*3.24*	0.029	*5.24*	0.088	*12.31*
Aged 35-44	0.129	*9.92*	0.033	*5.13*	0.063	*6.99*	0.054	*6.25*	0.004	*2.52*	0.015	*2.61*	0.052	*7.40*
Aged 45-54	0.070	*6.01*	0.022	*3.72*	0.033	*3.96*	0.026	*3.32*	0.002	*1.68*	0.004	*0.68*	0.026	*4.08*
Male	-0.027	*3.54*	0.018	*5.30*	0.031	*6.43*	-0.017	*3.32*	0.001	*0.67*	0.001	*0.13*	-0.098	*2.24*
Married	-0.038	*4.51*	0.017	*4.22*	-0.007	*1.26*	-0.015	*2.82*	-0.002	*2.34*	-0.019	*6.14*	-0.015	*3.57*
White	0.107	*8.07*	0.034	*5.04*	0.028	*3.20*	0.021	*2.37*	0.001	*0.82*	-0.006	*1.62*	0.040	*5.81*
Log labour income	0.011	*4.30*	0.006	*3.98*	0.010	*4.96*	0.004	*2.10*	0.001	*1.97*	-0.001	*1.04*	-0.002	*1.47*
Log other income	0.027	*12.29*	0.005	*4.78*	0.012	*7.84*	0.013	*8.84*	-0.000	*0.56*	0.005	*6.35*	0.004	*4.11*
Own outright	-0.189	*14.56*	-0.024	*3.52*	-0.088	*9.62*	-0.059	*6.65*	-0.003	*2.61*	-0.039	*8.32*	-0.071	*10.46*
Mortgage	-0.029	*2.73*	0.016	*3.05*	-0.001	*0.10*	0.025	*3.64*	-0.002	*2.05*	-0.017	*5.22*	-0.039	*7.68*
Rent	0.023	*1.73*	0.025	*3.73*	-0.005	*0.59*	-0.037	*3.92*	0.000	*0.80*	-0.034	*6.58*	0.019	*3.25*
Employee	-0.081	*5.79*	0.003	*0.45*	0.034	*3.40*	-0.004	*0.43*	0.001	*1.25*	-0.034	*6.98*	-0.029	*4.38*
Self employed	-0.078	*-4.60*	0.015	*1.87*	0.023	*2.00*	0.008	*0.70*	0.004	*2.56*	-0.018	*3.00*	-0.038	*4.24*
Unemployed	0.006	*0.35*	-0.002	*0.19*	0.049	*3.76*	0.015	*1.14*	0.003	*2.41*	-0.014	*2.06*	0.003	*0.39*
# Children	0.010	*2.43*	0.007	*4.07*	0.004	*1.67*	-0.001	*0.25*	0.000	*0.21*	0.002	*1.11*	0.008	*4.22*
# Adults	-0.012	*3.36*	-0.005	*2.84*	0.002	*0.74*	-0.009	*3.80*	-0.000	*0.18*	0.002	*1.77*	0.003	*1.72*
Good/Ex. Health	-0.048	*6.30*	-0.012	*3.32*	-0.036	*7.10*	-0.019	*3.88*	-0.002	*2.69*	-0.007	*2.47*	-0.020	*5.32*
Degree	0.146	*10.58*	0.008	*1.18*	0.064	*6.91*	0.084	*9.15*	0.004	*2.82*	0.082	*5.48*	0.021	*3.02*
Teaching/Nurse	0.138	*12.23*	0.020	*3.66*	0.083	*10.68*	0.092	*11.71*	0.002	*2.30*	0.045	*9.06*	0.000	*0.16*
A level	0.121	*9.10*	0.020	*3.13*	0.053	*5.79*	0.076	*8.32*	0.002	*1.76*	0.045	*8.50*	0.004	*0.54*
O level	0.116	*9.58*	0.029	*5.05*	0.058	*6.99*	0.082	*9.84*	0.001	*1.38*	0.024	*4.56*	0.015	*2.60*
Other qualification	0.113	*7.33*	0.021	*2.82*	0.060	*5.73*	0.052	*4.92*	0.001	*0.98*	0.009	*1.33*	0.030	*4.18*
ρ; p value	0.389; *p=0.000*		0.292; *p=0.000*		0.308; *p=0.000*		0.426; *p=0.000*		0.367; *p=0.000*		0.001; *p=0.490*		0.406; *p=0.000*	
Chi sq.(43); p value	1,999.1; *p=0.000*		752.1; *p=0.000*		1,461.2; *p=0.000*		1,213.8; *p=0.000*		163.5; *p=0.000*		1,362.9; *p=0.000*		1,221.9; *p=0.000*	
OBSERVATIONS	29,259													

Notes: Regional dummy variables are included as additional controls; M.E. denotes marginal effect.

TABLE 3: Random Effects Probit Analysis – Type of Asset and Club Membership

	PROB. OF HAVING ASSETS		NATIONAL SAVINGS		PREMIUM BONDS		UNIT TRUSTS		PERSONAL EQUITY PLAN		SHARES		OTHER INVESTMENTS	
	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT
1 Club (*t-1*)	0.029	*5.20*	0.001	*2.17*	0.015	*4.68*	0.005	*3.35*	0.007	*2.23*	0.020	*5.22*	0.009	*3.48*
2 Clubs (*t-1*)	0.062	*7.64*	0.001	*2.41*	0.028	*5.83*	0.010	*4.80*	0.019	*4.64*	0.051	*9.41*	0.022	*5.87*
3 Clubs (*t-1*)	0.067	*5.14*	0.001	*2.43*	0.032	*4.25*	0.013	*4.15*	0.028	*4.55*	0.056	*6.52*	0.030	*5.32*
4+ Clubs (*t-1*)	0.111	*5.09*	0.003	*3.07*	0.045	*3.64*	0.020	*4.23*	0.039	*4.03*	0.057	*3.98*	0.049	*5.67*
Aged 18-24	-0.163	*12.68*	-0.000	*0.09*	-0.091	*10.73*	-0.031	*6.78*	-0.094	*11.06*	-0.088	*9.14*	-0.013	*2.14*
Aged 25-34	-0.110	*11.21*	-0.001	*2.27*	-0.082	*12.30*	-0.023	*7.59*	-0.064	*11.93*	-0.044	*6.43*	-0.015	*3.35*
Aged 35-44	-0.060	*6.35*	-0.000	*1.23*	-0.053	*9.10*	-0.011	*4.23*	-0.032	*6.76*	-0.013	*2.06*	-0.014	*3.16*
Aged 45-54	-0.033	*4.06*	0.000	*0.32*	-0.023	*5.20*	-0.003	*1.72*	-0.008	*2.02*	-0.006	*1.13*	-0.009	*2.29*
Male	0.025	*4.33*	-0.000	*0.95*	-0.003	*0.74*	0.007	*4.52*	0.009	*3.01*	0.025	*5.88*	0.001	*0.37*
Married	0.049	*7.41*	0.001	*2.32*	0.030	*7.11*	0.009	*4.56*	0.023	*6.56*	0.031	*6.55*	0.017	*5.65*
White	0.054	*4.81*	0.001	*2.24*	0.035	*4.75*	0.004	*1.23*	0.009	*1.52*	0.031	*3.84*	0.018	*3.55*
Log labour income	0.012	*5.45*	0.002	*1.69*	0.003	*2.01*	0.003	*4.67*	0.012	*8.57*	0.010	*5.74*	0.003	*3.21*
Log other income	0.013	*7.52*	-0.000	*0.33*	0.004	*4.22*	0.001	*1.20*	0.001	*1.59*	0.005	*3.85*	0.001	*0.78*
Own outright	0.103	*10.10*	0.002	*3.11*	0.046	*7.27*	0.030	*8.11*	0.072	*11.76*	0.096	*12.04*	0.041	*7.99*
Mortgage	0.072	*8.09*	0.001	*1.60*	0.023	*4.19*	0.012	*4.17*	0.033	*6.10*	0.065	*9.32*	0.023	*5.13*
Rent	-0.080	*6.04*	-0.001	*1.85*	-0.042	*5.11*	-0.022	*4.02*	-0.060	*5.70*	-0.051	*4.67*	-0.013	*2.00*
Employee	-0.075	*6.73*	-0.001	*2.14*	-0.026	*3.96*	-0.011	*3.43*	-0.023	*3.70*	-0.020	*2.55*	-0.011	*2.14*
Self employed	-0.068	*5.24*	-0.000	*0.84*	-0.011	*1.54*	-0.005	*1.42*	0.002	*0.35*	-0.011	*1.23*	-0.009	*1.56*
Unemployed	-0.018	*1.10*	-0.001	*1.07*	-0.001	*0.08*	-0.019	*3.02*	-0.010	*0.98*	-0.011	*0.89*	-0.008	*1.01*
# Children	-0.020	*6.18*	-0.002	*1.26*	-0.008	*4.09*	-0.004	*4.19*	-0.080	*4.52*	-0.017	*7.29*	-0.006	*3.65*
# Adults	-0.024	*7.96*	-0.004	*2.60*	-0.011	*5.97*	-0.006	*5.86*	-0.011	*6.09*	-0.016	*7.32*	-0.008	*5.18*
Good/Ex. Health	0.025	*4.27*	0.001	*2.60*	0.009	*2.54*	0.005	*3.23*	0.012	*3.88*	0.014	*3.46*	0.004	*1.46*
Degree	0.198	*18.72*	0.003	*3.31*	0.087	*11.74*	0.038	*9.74*	0.099	*16.24*	0.118	*14.66*	0.041	*8.34*
Teaching/Nurse	0.131	*14.39*	0.002	*2.89*	0.069	*11.24*	0.028	*8.64*	0.064	*12.35*	0.080	*11.65*	0.030	*7.10*
A level	0.140	*12.94*	0.001	*2.26*	0.074	*10.17*	0.024	*6.94*	0.058	*9.35*	0.095	*11.77*	0.029	*5.72*
O level	0.122	*12.29*	0.002	*2.77*	0.067	*10.08*	0.021	*6.54*	0.051	*9.08*	0.073	*9.89*	0.031	*7.01*
Other qualification	0.077	*6.05*	0.000	*0.22*	0.040	*5.03*	0.008	*2.21*	0.033	*4.74*	0.046	*5.02*	0.022	*4.03*
ρ; p value	0.470; *p=0.000*		0.630; *p=0.000*		0.688; *p=0.000*		0.540; *p=0.000*		0.458; *p=0.000*		0.565; *p=0.000*		183; *p=0.000*	
Chi sq.(43); p value	1,971.8; *p=0.000*		301.6; *p=0.000*		1,211.4; *p=0.000*		801.6; *p=0.000*		1,296.9; *p=0.000*		1,462.1; *p=0.000*		637.4; *p=0.000*	
OBSERVATIONS	29,259													

Notes: Regional dummy variables are included as additional controls; M.E. denotes marginal effect.

TABLE 4: Random Effects Probit Analysis – Type of Debt, Financial Assets and Frequency of Social Interaction

PANEL A: DEBT	PROB. OF HAVING DEBT		HIRE PURCHASE		PERSONAL LOAN		CREDIT CARD		PRIVATE INDIVIDUAL		OVERDRAFT		OTHER DEBT	
	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT
Once a year or less (*t-1*)	0.012	*11.22*	0.002	*0.40*	0.003	*0.41*	0.007	*1.11*	-0.001	*0.97*	0.007	*1.65*	-0.002	*0.35*
Several times a year (*t-1*)	-0.028	*1.83*	-0.010	*1.54*	-0.020	*1.89*	-0.015	*1.58*	-0.001	*1.10*	-0.001	*0.14*	0.002	*0.23*
At least once a month (*t-1*)	-0.018	*0.93*	-0.001	*0.18*	-0.006	*0.43*	-0.010	*0.80*	-0.001	*0.88*	-0.015	*1.74*	-0.008	*0.86*
At least once a week (*t-1*)	-0.120	*3.30*	-0.041	*2.24*	-0.054	*2.12*	-0.053	*2.23*	-0.002	*0.66*	-0.001	*0.07*	-0.037	*1.92*
ρ; p value	0.425; *p=0.000*		0.306; *p=0.000*		0.330; *p=0.000*		0.428; *p=0.000*		0.390; *p=0.000*		0.001; *p=0.489*		0.392; *p=0.000*	
Chi sq.(43); p value	1,183.9; *p=0.000*		409.6; *p=0.000*		882.7; *p=0.000*		753.8; *p=0.000*		87.6; *p=0.000*		994.9; *p=0.000*		663.2; *p=0.000*	
OBSERVATIONS	19,191													

PANEL B: ASSETS	PROB. OF HAVING ASSETS		NATIONAL SAVINGS		PREMIUM BONDS		UNIT TRUSTS		PERSONAL EQUITY PLAN		SHARES		OTHER INVESTMENTS	
	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT
Once a year or less (*t-1*)	0.037	*5.14*	0.000	*1.06*	0.011	*2.81*	0.006	*3.44*	0.021	*5.26*	0.014	*2.98*	0.004	*1.83*
Several times a year (*t-1*)	0.058	*5.59*	0.001	*1.11*	0.020	*3.48*	0.007	*3.11*	0.028	*4.94*	0.028	*4.05*	0.007	*2.64*
At least once a month (*t-1*)	0.029	*2.21*	0.002	*1.08*	0.007	*1.04*	0.009	*3.08*	0.017	*2.32*	0.028	*3.28*	0.007	*1.93*
At least once a week (*t-1*)	0.042	*1.79*	0.000	*0.32*	0.026	*2.11*	0.007	*1.42*	0.013	*1.00*	0.017	*1.12*	0.005	*0.78*
ρ; p value	0.542; *p=0.000*		0.763; *p=0.000*		0.731; *p=0.000*		0.613; *p=0.000*		0.468; *p=0.000*		0.594; *p=0.000*		0.344; *p=0.000*	
Chi sq.(43); p value	1,091.3; *p=0.000*		102.9; *p=0.000*		666.7; *p=0.000*		415.3; *p=0.000*		747.4; *p=0.000*		812.9; *p=0.000*		236.8; *p=0.000*	
OBSERVATIONS	19,191													

Notes: Additional control variables are as in Table 2; Regional dummy variables are included as additional controls; M.E. denotes marginal effect.

TABLE 5: Random Effects Analysis – Debt, Assets, Net Worth and Social Interaction

	LOG UNSECURED DEBT (TOBIT)		LOG FINANCIAL ASSETS (TOBIT)		LOG NET WORTH		LOG UNSECURED DEBT (TOBIT)		LOG FINANCIAL ASSETS (TOBIT)		LOG NET WORTH	
	M.E.	TSTAT	M.E.	TSTAT	COEF	TSTAT	M.E.	TSTAT	M.E.	TSTAT	COEF	TSTAT
Intercept	-8.486	*18.11*	-15.926	*21.63*	6.095	*14.28*	-8.076	*14.39*	-16.686	*18.83*	6.059	*12.21*
1 Club (*t-1*)	0.265	*2.25*	0.894	*5.38*	0.341	*2.94*	–		–		–	
2 Clubs (*t-1*)	0.427	*2.37*	1.882	*7.91*	0.418	*2.40*	–		–		–	
3 Clubs (*t-1*)	0.289	*0.94*	2.117	*5.55*	0.589	*2.04*	–		–		–	
4+ Clubs (*t-1*)	0.393	*0.74*	3.302	*5.38*	0.732	*1.48*	–		–		–	
Once a year or less (*t-1*)	–		–		–		0.246	*1.52*	1.189	*5.31*	0.248	*1.57*
Several times a year (*t-1*)	–		–		–		-0.456	*1.79*	1.867	*5.76*	0.581	*2.38*
At least once a month (*t-1*)	–		–		–		-0.311	*0.97*	1.144	*2.77*	0.580	*1.85*
At least once a week (*t-1*)	–		–		–		-1.840	*3.01*	1.366	*1.89*	1.288	*2.26*
Aged 18-24	3.458	*13.58*	-5.351	*13.57*	-8.477	*32.28*	3.254	*9.99*	-5.896	*11.52*	-8.843	*26.16*
Aged 25-34	3.548	*16.37*	-3.548	*11.97*	-5.547	*28.83*	3.352	*12.21*	-3.706	*9.90*	-5.092	*21.39*
Aged 35-44	2.337	*10.96*	-1.966	*6.91*	-2.886	*15.82*	2.145	*7.98*	-1.736	*4.90*	-2.754	*12.33*
Aged 45-54	1.292	*6.79*	-1.067	*4.49*	-1.382	*8.86*	0.913	*3.69*	-0.899	*2.94*	-1.255	*6.31*
Male	-0.132	*1.07*	0.925	*5.13*	-1.134	*7.29*	-0.064	*0.42*	0.925	*4.35*	-1.119	*6.12*
Married	-0.623	*4.57*	1.613	*8.01*	2.045	*13.67*	-0.794	*4.61*	1.744	*7.01*	2.220	*12.18*
White	1.624	*7.47*	1.585	*4.62*	-0.640	*2.75*	1.408	*5.94*	1.089	*2.93*	-0.392	*1.55*
Log labour income	0.213	*4.84*	0.468	*6.75*	-0.096	*2.41*	0.255	*4.72*	0.504	*5.90*	-0.152	*3.19*
Log other income	0.489	*13.65*	0.385	*7.37*	0.107	*3.19*	0.535	*11.78*	0.467	*7.09*	0.064	*1.55*
Own outright	-3.218	*15.07*	3.595	*11.57*	–		-3.594	*13.35*	4.236	*10.80*	–	
Mortgage	-0.443	*2.61*	2.395	*8.73*	–		-0.609	*2.82*	2.764	*7.89*	–	
Rent	0.061	*0.28*	-2.823	*6.84*	–		-0.141	*0.50*	-2.957	*5.39*	–	
Employee	-1.459	*6.41*	-2.484	*7.34*	1.388	*5.83*	-1.868	*6.41*	-2.938	*6.77*	2.268	*7.65*
Self employed	-1.202	*4.37*	-2.083	*5.34*	1.767	*6.69*	-1.355	*3.86*	-2.796	*5.64*	2.364	*7.22*
Unemployed	0.024	*0.08*	-0.644	*1.31*	-0.806	*2.90*	0.329	*0.83*	-0.986	*1.42*	-1.218	*3.17*
# Children	0.170	*2.61*	-0.699	*7.00*	-0.037	*0.58*	0.159	*1.91*	-0.761	*6.22*	-0.066	*0.84*
# Adults	-0.158	*2.76*	-0.788	*8.59*	0.004	*0.06*	-0.085	*1.17*	-0.963	*8.29*	-0.043	*0.51*
Good/Ex. Health	-0.819	*6.67*	0.850	*4.73*	1.134	*9.47*	-1.111	*7.02*	0.684	*3.01*	1.293	*8.67*
Degree	2.993	*13.27*	6.613	*20.20*	2.363	*10.75*	3.596	*12.71*	6.821	*16.60*	2.127	*8.07*
Teaching/Nurse	2.598	*13.89*	4.488	*15.64*	2.113	*11.83*	2.744	*11.48*	4.672	*13.05*	1.897	*8.70*
A level	2.322	*10.61*	4.609	*13.79*	1.948	*8.74*	2.648	*9.44*	4.417	*10.36*	1.795	*6.57*
O level	2.079	*10.42*	4.042	*13.24*	1.489	*7.30*	2.123	*8.22*	4.234	*10.81*	1.336	*5.39*
Other qualification	1.886	*7.45*	2.536	*6.50*	0.972	*3.78*	1.674	*5.06*	2.265	*4.45*	0.674	*2.10*
ρ; p value	0.351; *p=0.000*		0.436; *p=0.000*		0.472; *p=0.000*		0.384; *p=0.000*		0.498; *p=0.000*		0.529; *p=0.000*	
Chi sq.(d); p value	2,699.7; *p=0.000*		2,412.8; *p=0.000*		3,606.8; *p=0.000*		1,928.4; *p=0.000*		1,711.5; *p=0.000*		2,602.5; *p=0.000*	
σ	6.182; *p=0.000*		7.043; *p=0.000*		–		6.274; *p=0.000*		6.579; *p=0.000*		–	
OBSERVATIONS	29,259				15,002		19,191				9,788	

Notes: Regional dummy variables are included as additional controls; M.E. denotes marginal effect; d=43 except for the net worth regressions where d=40; for the net worth specifications, the head of household is the unit of observation; the intercept is not scaled.

TABLE 6: Random Effects Probit Analysis – Type of Debt and Financial Asset: Predicted Social Interaction

PANEL A: DEBT: IV CLUB	PROB. OF HAVING DEBT		HIRE PURCHASE		PERSONAL LOAN		CREDIT CARD		PRIVATE INDIVIDUAL		OVERDRAFT		OTHER DEBT	
	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT
Predicted club membership	-0.030	*2.56*	-0.032	*0.58*	-0.011	*1.46*	-0.016	*2.21*	0.001	*0.33*	-0.036	*7.64*	-0.037	*5.27*
ρ; p value	0.387; *p=0.000*		0.291; *p=0.000*		0.307; *p=0.000*		0.426; *p=0.000*		0.365; *p=0.000*		0.001; *p=0.491*		0.405; *p=0.000*	
Chi sq.(40); p value	2,002.2; *p=0.000*		749.5; *p=0.000*		1,462.1; *p=0.000*		1,209.0; *p=0.000*		163.0; *p=0.000*		1,417.9; *p=0.000*		1,224.4; *p=0.000*	
PANEL B: ASSET: IV CLUB	PROB. OF HAVING ASSETS		NATIONAL SAVINGS		PREMIUM BONDS		UNIT TRUSTS		PERSONAL EQUITY PLAN		SHARES		OTHER INVESTMENTS	
	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT
Predicted club membership	0.039	*5.07*	0.001	*2.95*	0.022	*4.96*	0.001	*2.76*	0.007	*2.88*	0.031	*6.11*	0.031	*8.65*
ρ; p value	0.472; *p=0.000*		0.630; *p=0.000*		0.689; *p=0.000*		0.548; *p=0.000*		0.462; *p=0.000*		0.567; *p=0.000*		0.193; *p=0.000*	
Chi sq.(40); p value	1,938.7; *p=0.000*		299.9; *p=0.000*		1,197.9; *p=0.000*		781.2; *p=0.000*		1,281.2; *p=0.000*		1,427.5; *p=0.000*		641.5; *p=0.000*	
OBSERVATIONS	29,259													
PANEL C: DEBT: IV FREQUENCY	PROB. OF HAVING DEBT		HIRE PURCHASE		PERSONAL LOAN		CREDIT CARD		PRIVATE INDIVIDUAL		OVERDRAFT		OTHER DEBT	
	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT
Predicted frequency	-0.128	*5.34*	-0.026	*2.27*	-0.036	*2.15*	-0.045	*3.00*	0.001	*0.21*	-0.020	*2.18*	-0.050	*3.97*
ρ; p value	0.421; *p=0.000*		0.305; *p=0.000*		0.331; *p=0.000*		0.426; *p=0.000*		0.390; *p=0.000*		0.001; *p=0.000*		0.385; *p=0.000*	
Chi sq.(40); p value	1,198.0; *p=0.000*		409.2; *p=0.000*		880.9; *p=0.000*		756.2; *p=0.000*		87.6; *p=0.000*		998.1; *p=0.000*		674.9; *p=0.000*	
PANEL D: ASSET: IV FREQUENCY	PROB. OF HAVING ASSETS		NATIONAL SAVINGS		PREMIUM BONDS		UNIT TRUSTS		PERSONAL EQUITY PLAN		SHARES		OTHER INVESTMENTS	
	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT	M.E.	TSTAT
Predicted frequency	0.007	*0.44*	0.001	*0.54*	-0.002	*0.22*	0.006	*1.99*	0.017	*2.25*	0.006	*2.62*	-0.001	*0.29*
ρ; p value	0.545; *p=0.000*		0.765; *p=0.000*		0.731; *p=0.000*		0.614; p		0.472; *p=0.000*		0.597; *p=0.000*		0.352; *p=0.000*	
Chi sq.(40); p value	1,074.4; *p=0.000*		104.5; *p=0.000*		665.6; *p=0.000*		412.9; *p=0.000*		739.6; *p=0.000*		802.4; *p=0.000*		229.0; *p=0.000*	
OBSERVATIONS	19,191													

Notes: Additional control variables are as in Table 2; M.E. denotes marginal effect; standard errors are bootstrapped.

TABLE 7: Random Effects Analysis – Debt, Assets and Net Worth: Predicted Social Interaction

	LOG UNSECURED DEBT (TOBIT)		LOG FINANCIAL ASSETS (TOBIT)		LOG NET WORTH		LOG UNSECURED DEBT (TOBIT)		LOG FINANCIAL ASSETS (TOBIT)		LOG NET WORTH	
	M.E.	TSTAT	M.E.	TSTAT	COEF	TSTAT	M.E.	TSTAT	M.E.	TSTAT	COEF	TSTAT
Intercept	-8.390	*17.98*	-21.26	*21. 26*	6.197	*14.56*	-8.181	*14.58*	-16.670	*18.76*	6.124	*12.35*
Predicted club membership	-0.412	*3.70*	0.917	*5.27*	0.190	*1.05*	–		–		–	
Predicted frequency	–		–		–		-1.353	*5.49*	-0.451	*0.82*	1.188	*2.79*
ρ; p value	6.197; *p=0.000*		0.438; *p=0.000*		0.472; *p=0.000*		0.380; *p=0.000*		0.503; *p=0.000*		0.530; *p=0.000*	
Chi sq.(d); p value	2,709.9; *p=0.000*		2,368.2; *p=0.000*		3,592.0; *p=0.000*		1,941.0; *p=0.000*		1,678.4; *p=0.000*		2,595.8; *p=0.000*	
σ	6.187; *p=0.000*		7.046; *p=0.000*		–		6.288; *p=0.000*		6.752; *p=0.000*		–	
OBSERVATIONS	29,259				15,002		19,191				9,788	

Notes: Additional control variables are as in Table 5; M.E. denotes marginal effect; d=40 except for the net worth regressions where d=37; for the net worth specifications, the head of household is the unit of observation; standard errors are bootstrapped; the intercept is not scaled.

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