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SELF-CONTROL, FINANCIAL LITERACY & THE CO-HOLDING PUZZLE

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ABSTRACT

We use UK survey data incorporating measures of financial literacy and behavioral characteristics to analyze the puzzling co-existence of high cost revolving consumer credit alongside low yield liquid savings in household balance sheets, which we term the ‘co-holding puzzle’. Approximately 14% of households in our sample co-hold, on average, £3,400 of revolving consumer credit on which they incur interest charges, even though they could immediately pay down all this debt using their liquid assets. Co-holders are typically more financially literate, with above average income and education. However, we show co-holding is also associated with impulsive spending behavior on the part of the household. Our results provide empirical support to theoretical models in which households co-hold as a means of managing self-control problems.

Keywords: Consumer credit, Self-control, Financial literacy

JEL Classification: D03 D10 D12 E21

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Why do consumers simultaneously hold high cost credit and low yield liquid assets? We show that in a sample of UK households 14% hold, on average, £3,400 of revolving consumer credit on which they incur interest charges even though they could immediately pay down all this debt using their liquid assets. By co-holding credit and assets, these households incur on average £600 in unnecessary interest charges per annum. A subset of these, 4% of the sample, incur £1,300 in unnecessary interest charges per annum.

What explains this stark violation of simple arbitrage between assets and debt? A number of explanations have been offered in the existing literature. Households may hold liquid assets to transact purchases for which consumer credit cannot be used (Telyukova and Wright, 2008), or because credit limits, if paid down, might be withdrawn and leave the individual credit constrained and unable to borrow to fund emergency expenses (Fulford, 2012). Alternatively, consumers might co-hold because they are unaware of the financial consequences of foregoing a simple arbitrage opportunity.

A further explanation, which we focus upon in this paper, is that co-holding can be rationalized as a form of self-control management. Bertaut et al. (2009) theoretically explain the co-holding puzzle in a dual-self model in which one patient entity of the ‘inner-self’ controls a less patient entity by restricting access to credit so as to control impulsive consumption. Co-holding in their model is a response of consumers who realize their self-control problem and act to limit its consequences.

We present empirical evidence that consumers deliberately reduce their available-to-spend liquidity on consumer credit as a way of guarding themselves from their own impulsiveness in a manner consistent with the Bertaut et al. (2009) model. Our survey data provides access to broad range of questions on behavioral characteristics for a representative sample of UK households. Analysis shows that co-holding is not associated with poor financial illiteracy or expected credit constraints. Characteristics of co-holding households suggest their behavior is unlikely to be due to low levels of financial understanding or limited attention to their finances. They perform above-average when answering financial literacy questions, report above average rates of attention to the financial news media and of planning their financial decisions.

However, co-holders also self-report high rates of impulsive spending behavior. In a sample of borrowers and co-holders, co-holding is positively predicted by both impulsiveness and high financial literacy. We further show that, conditional upon these, co-holding is positively predicted by the extent to which

an individual plans their financial decisions but is unrelated to measures of time preference, i.e. patience. These results are robust to controls for income risk, credit constraints and alternative measures of the cost of co-holding. These results lead us to conclude that co-holding is a planned behavior undertaken by financially literate households in response to self-control problems.

We make the following new contributions to the literature: Firstly, we provide new evidence on the make-up of co-holding in the population. We find that co-holding is prevalent among approximately one eighth of the households in our sample of UK consumers, many of whom hold several thousands of pounds of liquid savings and consumer credit simultaneously. Furthermore, we show that co-holding households have relatively complex portfolios of consumer credit. They hold multiple credit items on which they revolve consumer credit including credit cards, installment loans and flexible options such as overdrafts. Co-holding households hold a range of credit items which could be repaid or pre-paid, together with installment loans on which pre-payment may not be possible or may be costly.

Secondly, we provide new evidence on the financial literacy of co-holders. We split our sample into different groups depending on their saving-borrowing behavior, i.e. savers, borrowers, co-holders and those who neither save nor borrow. Households in the co-holding group are typically more educated, more likely to have both household head and their spouse employed, have higher incomes and are more likely to be home-owners. Furthermore, respondents from co-holding households on average do better at answering the questions we use to measure financial literacy than borrowers. However, they are also much more likely to report being impulsive in their spending decisions and to exhibit self-control problems in their spending. We estimate a multinomial probit model and find that these differences across groups are significant. Hence co-holding households have characteristics consistent with those of households of a planner-doer type.

Thirdly, we estimate a series of econometric models which relate our measure of financial literacy and measures of behavioral traits to the likelihood and magnitude of co-holding. We control for a broad set of covariates and test the sensitivity of our analysis to different levels of co-holding. We find a positive relationship between both the financial literacy and impulsiveness of a household and the likelihood of co-holding. Our estimates imply that a household which exhibits impulsiveness in spending decisions is approximately 80% more likely to co-hold at least £1,500 of consumer credit and that impulsiveness is associated with co-holding approximately £3,100, equivalent to foregoing £550 in interest

payments per annum. We test the robustness of our findings to a variety of specifications.

Fourthly, we incorporate self-reported measures of income and expenditure risk into the analysis and show that co-holding is not explained by expected future income losses which might induce precautionary saving behavior on the part of the household in the face of perceived income risk. Co-holders self-report rates of expected unemployment similar to non-co-holders and average rates of expected future additional credit use below those of borrowers. The econometric analysis finds no evidence for future income- or expenditure risk increasing the likelihood of co-holding. We also incorporate measures of credit constraints, which do not alter our results.

This paper contributes to the behavioral explanation of co-holding relevant to at least a subset of households observed to co-hold and contributes to the existing literature which seeks to understand whether consumers behave rationally in credit markets (Bernheim, 1995; Campbell, 2006; Agarwal et al., 2006, 2009). Our results are also relevant to the literature of financial literacy and individual behavior (Bernheim, 1998; Lusardi, 2008; Jappelli, 2010) and more generally to the literature on the role of self-control problems in shaping individual behavior related to financial decision making (Strotz, 1955; Thaler and Shefrin, 1981; Laibson, 1997; Gul and Pesendorfer, 2001; Benhabib and Bisin, 2005; Fudenberg and Levine, 2006; Heidhues and Koszegi, 2010).

2 LITERATURE REVIEW

The co-holding puzzle was first documented by Gross and Souleles (2002) in their analysis of lender provided credit card data. They found 90% of individuals with credit card debt had liquid assets in checking and savings accounts and 33% of those with credit card debt had a least two months of disposable income available. They labeled this co-holding finding in their credit card data the ‘credit card puzzle’. More recently, Telyukova (2011) analyzes the 2001 US Survey of Consumer Finances (SCF) and finds that 27% of households hold, on average, over \$5,700 of revolving credit card debt while at the same time holding, on average, over \$7,300 of liquid savings. However, as we show below, the co-holding puzzle is not limited to credit card debt. In our sample, the median co-holder holds revolving balances on multiple consumer credit products for which the balance could be repaid or pre-paid without cost including store cards, mail order catalogue debt and bank overdrafts.

In general, studies using US data find that roughly one third of households in the population co-hold sizeable amounts of liquid savings, ranging between \$2,600 and \$8,500, and credit card debt, ranging between \$1,200 and \$5,700 (Gross and Souleles, 2002; Telyukova and Wright, 2008; Bertaut et al., 2009; Telyukova, 2011; Fulford, 2012). The difference in these numbers can be attributed to different definitions of what constitutes ‘revolving credit card debt’, ‘liquid savings’ and how the studies attribute for short term liquidity requirements. Co-holders are typically in the middle age bracket, have a high level of education and have high annual income.

Conventional life-cycle models cannot explain the existence of co-holding and struggle to match the prevalence of revolving consumer credit in household balance sheets. Angeletos et al. (2001) simulate a life-cycle model and attempt to match distributions of consumer credit in the SCF, but fail to match high rates and levels of revolving credit. Laibson et al. (2003) incorporate features into a conventional life-cycle model which increase the demand for credit among agents including steep labor income paths, transitory income shocks and bankruptcy, but can only match observed levels of borrowing by allowing for very high discount rates which fail to account for observed levels of savings. However, Laibson et al. (2007) go on to show that using non-exponential discount functions that generate self-control problems achieve a better fit to the empirical data.

In the remainder of this section we consider explanations for co-holding.

2.1 *Liquidity Management & Precautionary Savings*

In two papers, Telyukova and Wright (2008) and Telyukova (2011) argue that the co-holding puzzle is simply a new form of the rate of return dominance puzzle in monetary economics (the coexistence puzzle as to why individuals hold cash which has a negative real return, instead of holding interest-bearing bonds). In their models, unpredictability of cash requirements motivates the holding of liquid balances even though the individual holds costly consumer credit debt. The authors cite unanticipated household expenses such as automotive or home repairs (Telyukova and Wright, 2008) and predicted expenses such as mortgage and rent payments, utilities, babysitting and daycare services (Telyukova, 2011) as examples of such expenditures which cannot be paid for using credit.

This explanation is dependent upon consumers facing sizeable volumes of purchases for which credit cards cannot be used. However, as Fulford (2012) demonstrates, the share of co-holders in the US has remained almost constant since 1992, but the acceptance of credit cards for transactions has increased substantially and the share of non-cash transactions per person increased ac-

cordingly from 22% in 1995 to 67% in 2006, implying that cash transactions have decreased (Gerdes, 2008). Also, cash advances seem to almost eliminate the requirement to keep cash for emergencies. Gerdes (2008) illustrates that cash advances are likely used exactly for short-term liquidity requirements during emergencies as mean cash advances withdrawals are considerable higher than average ATM withdrawals.

Fulford (2012) develops an alternative liquidity-based explanation: consumers co-hold for precautionary reasons because credit limits might be withdrawn if balances are paid down. Cash money acts as an insurance policy so that during bad times or when a credit company withdraws lines of credit the consumer still has access to funds. With stochastic borrowing limits, consumers build up wealth to protect themselves from borrowing uncertainty. The optimizing household never co-holds with a certain borrowing limit, but may co-hold with a stochastic borrowing limit. The notion that the debt limit can vary unexpectedly is the cornerstone of Fulford's model, and he argues that this modification can explain the credit card puzzle.

Both models cannot account fully for observed accumulations of liquid assets which are typically much higher in survey data than the models suggest, and two factors additionally question the relevance of these models in the UK, the context for this study. Firstly, payment restrictions do not apply to either medical or housing expenses or any other sizeable purchases. Credit card payment options are ubiquitous, available for almost all payments of more than a few pounds in value. Secondly, there is no empirical evidence to suggest that UK consumer credit holders face a high probability of credit lines being withdrawn, hence there appears to be no foundation for the hypothesis that consumers co-hold for precautionary reasons. In contrast to mortgage credit availability, consumer credit demand and credit limits and have increased over the past years (Bank of England, 2012).

2.2 *Dual-Self Models*

In the models of Telyukova and Wright (2008) and Fulford (2012) impulsiveness plays no role as co-holding is undertaken as an exercise of financial management. In fact, the models rule out an association of self-control problems with co-holding explicitly by assumption that consumers exhibit time-consistent preferences. Also in the models of Telyukova and Wright (2008) and Fulford (2012) financial literacy is assumed as consumers show full financial awareness. In this and the next subsection we show the potential importance of these as explanations for co-holding.

Co-holding can be explained a form of self-control management. Bertaut et al. (2009) develop a dual-self model with the idea that one patient entity of the 'inner-self' controls a less patient entity by restricting access to credit so as to control consumption. This theory to explain co-holding behavior as means of self-control is similar to the planner-doer framework of Shefrin and Thaler (1988), which is built upon the observation that an individual's plan for future behavior is often more constant and foresighted than the actual myopic behavior. The myopic 'doer' selfishly cares only about his own immediate gratification, the 'planner' cares about the present and future equally. In the model of Bertaut et al. (2009) "the separation of purchase from payment made possible by credit cards creates potential for differential impatience between the entities responsible for the two actions: the shopper and the accountant" (p.658).

Self-control is a central feature of the model: a patient 'accountant' self who manages the finances of the household and has sole access to liquid savings with which to pay down credit decides to revolve debt in order to restrict the consumption opportunities of an impatient 'shopper' self who cannot access savings and is reliant on the credit decisions of the accountant. The authors show that stable equilibrium exists in which savings and credit are held simultaneously by the accountant-shopper, which in their model either constitutes a two-person household or a single self-aware individual who undertakes planning behavior as an accountant to restrict the consumption opportunities they will be tempted to indulge in as a shopper.

In this rationalization, co-holding behavior is actually a rational response of a consumer to the realization of their impulsive spending tendencies. These consumers are sophisticated in the sense that they correctly predict that their future selves will not honor the preferences of their present selves. Consumers suffer from a dual-self dichotomy and hence are tempted to consume against their better financial judgment. Realizing their inner-self conflict, they deliberately hold outstanding consumer credit balances in order to limit their opportunity to consume impulsively. Savings balances cannot be easily used for on-demand transactions, i.e. there is typically a delay of at least a few hours to a few days until savings balances can be accessed. Thus, by making one's savings less accessible and perceiving savings as non-spendable for immediate consumption, consumers minimize their vulnerability of impulsive spending by maintaining revolving consumer credit debt simultaneously with savings.

Telyukova and Wright (2008) and Telyukova (2011) argue that this is a costly kind of control, as there are much cheaper ways of controlling consumption, for instance by simply reducing one's credit card limit. But this criticism neglects that a voluntary reduction of available credit is reversible, which does not seem

useful for a self-control device. It also ignores empirical evidence regarding credit line utilization rates found by [Gross and Souleles \(2002\)](#) and theoretical predictions from buffer stock saving models, for instance [Carroll and Samwick \(1997\)](#): credit lines are not fully exhausted because of a precautionary saving motive and reducing the credit card limit voluntarily would either cancel out the buffer or would force consumption to decline if the consumer would like to keep a buffer.

Similarly, in the accountant-shopper model, the shopper has a precautionary saving motive because he knows that the payments of the accountant are stochastic. Furthermore, [Telyukova and Wright \(2008\)](#) argue that ‘spouse-control’ implied by the accountant-shopper model “cannot be the biggest piece of the puzzle” (p.644) as in US data married and single households do not behave differently with respect to co-holding. Here they overlook that the accountant-shopper model provides a framework that extends to both individual self-control as well as household-wide ‘spouse-control’, hence it is difficult to distinguish co-holding behavior between single and married houses in survey data.

The contribution of Bertaut, Haliassos and Reiter’s accountant-shopper model is to show that a simple deviation from a standard model, the introduction of differential time-preference, is sufficient to generate co-holding in simulated consumers for a wide range of assets and even modest differences in time-preference. The model does not rely on limited financial literacy, and co-holding is generated even though both entities are fully financially aware, which is consistent with the observation that overspending of credit card holders appears unrelated to financial ignorance ([Durkin, 2000](#)).

2.3 *Financial Literacy*

Consumers might co-hold because they are unaware of the consequences due to poor financial literacy (for recent examples of applications of financial literacy see [Lusardi and Mitchell, 2007](#); [Lusardi and Tufano, 2009](#); [Van Rooij et al., 2011a,b](#)). By this explanation, some individuals misunderstand their budget constraint because they struggle to understand the workings of basic numerical and financial concepts. If they fail to understand the mathematical construct of the budget constraint, consumers may make suboptimal financial choices because they fail to understand the financial environment in which they live.

Within the context of co-holding, individuals may accrue consumer credit debt because they are less literate and do not understand the terms of credit products. Less literate individuals may be more likely to fail to realize the existence of arbitrage opportunities and hence do not recognize that co-holding is

a costly activity. This is a contrasting prediction to the model of Bertaut et al. (2009) where co-holding arises although consumers are fully financially capable. To the best of our knowledge, no study has analyzed the relationship between financial literacy and co-holding so far and this is the first research undertaken to invest this link. The positive relationship between usage of higher-cost forms of credit and illiteracy has been supported by research of Lusardi and Tufano (2009) for the US and Disney and Gathergood (2013) for the UK.

2.4 Other Explanations

There are two other potential explanations for co-holding. First, the cost of portfolio management. Telyukova (2011) calculate that a household in the ‘puzzle’ group loses \$734 per annum on average (we find the average loss in our data to be £600 or around \$940). It is possible that households are untroubled by this loss, or that they are unaware of it. A ‘limited attention’ explanation would be consistent with the observation of Corwin and Coughenour (2008), who demonstrate that investors pay more attention and allocate more effort towards the most active items in their portfolio. If the loss incurred by co-holding is not visible to the household, limited attention might provide a simple rationalization.

Second, co-holding might be explained by mental accounting. This explanation has at its core that individuals “do not treat all money as fungible, but instead assign different types of expenditures to different mental accounts” (Frederick et al., 2002, p.373). This suggests that larger amounts of money are coded as ‘savings’ while smaller amounts are coded as ‘consumption’ with a higher to willingness to spend from the latter account (Thaler, 1985). Relating this idea directly to consumption choice, Prelec and Loewenstein (1998) argue that payments for consumption causes an immediate disutility, i.e. a ‘pain of paying’. Their model suggests that different ways of paying for purchases, for instance by cash, credit cards or a consumer loan, can lead to different purchasing decisions even when holding net present value of payments constant.

Within the context of co-holding, mental accounting has two implications: First, consumers may treat their ‘liquid savings’ and their ‘consumer credit’ differently and built up a reluctance to pay off credit as the mental ‘savings account’ has a very low willingness to spend. This implies that individuals built up revolving consumer credit due to a mental barrier that prevents them from accessing liquid savings that could be used to pay off debt. Second, consumers may roll-over debt because financing options allow individuals to disassociating consumption from the ‘pain of paying’. As before, consumers are then reluctant

to pay off the debt using their savings because of a low willingness to spend out of the savings account.

3 DATA & ANALYSIS

Our empirical analysis focuses on the role of impulsiveness as the driving factor behind co-holding, as in the model of [Bertaut et al. \(2009\)](#). Our data is drawn from the YouGov DebtTracker survey of household finances, also used in [Gathergood \(2012\)](#) and [Disney and Gathergood \(2013\)](#). The Debt Tracker is a quarterly cross-sectional survey of a representative sample of approximately 3,000 UK households conducted via the Internet. YouGov makes special provisions for non-internet users such that their survey sample is representative of the population as a whole. The survey includes approximately 85 questions which cover in detail household finances, demographic, education, labor market and financial product use topics.

Summary statistics for our sample of households are provided in [Table 1](#). Column 1 reports mean values for the whole sample of 2,584 households. Half of all respondents are male, two thirds married and one fifth with children. 59% of households have a respondent in employment, with 43% having the respondent's spouse or partner in full-time employment. Two thirds of households are home-owners. Mean household income is £35,300. [Table 1](#) also provides summary statistics for our measure of co-holding, income and expenditure risk plus behavioral characteristics. We describe these now in more detail.

3.1 *Measure of Co-Holding*

We measure the degree of co-holding among households in the survey by combining data on balances on consumer credit products with data on liquid savings. The survey data contains individual balances on the full range of consumer credit products held by households. Respondents were asked to state the value of outstanding debt for each product, excluding balances which would be repaid within the current payment period such as balances on credit and store cards which would be cleared before interest was due. We sum the value of individual balances on each consumer credit product to give a value for total outstanding consumer credit. Among our whole sample (Column 1) the mean value of consumer credit debt is £2,036.

We use a specific self-reported measure of liquid savings as a more accurate measure of savings accessible to the household than an imputed value based

on observed balances on types of savings accounts and investment products, which requires assumptions about the liquidity of particular types of saving products and investment. Hence the value of liquid savings we use is based on the respondents' own judgment about the liquidity of their savings and investments.

The total value of liquid savings is derived from a survey question in which respondents were asked to state the value of their non-pension savings which could be accessed easily:

- 'How much do you [and your partner] have in liquid savings? These are savings that could easily be used in an emergency and are not tied up in a pension or long term savings product.'

The use of 'emergency funds' as a measure of liquid savings has been conceptualized by [Johnson and Widdows \(1985\)](#), who define it as very liquid assets including money market funds, savings- and checking accounts. This definition is the basis for liquid savings in household surveys such as the SCF. It is not an assumption that survey respondents are familiar with this definition, but it provides researchers with a guide of what can be viewed as liquid savings.

The mean value among our whole sample is £9,211 that compare with mean savings account balances reported by households in the Wealth and Assets Survey, the principal survey of household finances in the UK, comparable to the US Survey of Consumer Finances. From was data covering the period 2006–2008, the most recent wave of the survey available at the time of writing, the mean balance on saving accounts for households in the whole sample was £8,700, of which £5,900 was held in standard savings accounts and £2,800 in tax-exempt Individual Savings Accounts (ISA).

We combine these data on outstanding consumer credit debt and liquid savings to divide our sample into four groups which we compare in our analysis: borrowers, savers, neither borrowers nor savers and co-holders. Borrowers are defined as households with non-zero total consumer credit balances and zero liquid savings. Savers, conversely, are defined as households with non-zero liquid savings and zero consumer credit balances. The group 'neither borrowers nor savers' is defined as households with zero reported liquid savings and zero reported consumer credit balances. Co-holders are defined as households with non-zero total consumer credit balances and non-zero liquid savings. These four categories are exhaustive and mutually exclusive.

For the co-holding groups we calculate the amount of co-holding for each household. The calculated value of co-holding is not central to our analysis as we mostly compare household groups by four categories. We calculate co-holding values firstly to show that the levels of co-holding among households in

the sample are non-negligible and imply substantial interest finance costs and secondly for our analysis of the extent of co-holding later in the paper.

Co-holders can be classified into two groups based on the relative size of their liquid savings and consumer credit debts. Firstly, some co-holding households hold liquid saving balances in excess of their consumer credit balances and so could pay down all their consumer credit balance with savings to spare. Secondly, other co-holding households hold liquid savings balances below their consumer credit balances and so could only partly pay down their consumer credit balance if they exhausted all of their liquid savings.

To allow for short-term savings needs when calculating co-holding values, we exclude £500 of liquid savings from our measure of co-holding. Hence we calculate the amount of consumer credit outstanding held by the household which could be paid down by the household's liquid savings while allowing the household to retain £500 in liquid savings. For example, a household with £2,500 of liquid savings and £4,000 of consumer credit would have measured co-holding of £2,000. Based on this calculation, the mean value for co-holding among co-holders in our sample is £3,412. Our results are not sensitive to reducing the £500 value to zero.

3.2 *Financial Literacy Questions*

Our survey includes three financial literacy questions, responses to which are used as a measure of financial literacy on the part of the household. The financial literacy literature, which has emerged in the discipline of economics over the past five years, uses survey questions on core topics in economics and finance to measure individual understanding of essential concepts (Lusardi, 2008). The literature has documented that understanding of concepts such as interest compounding, nominal compared with real returns and portfolio diversification are typically low in the population and lack of understanding is typically associated with lower participation in private retirement saving planning or stock market investments and a higher likelihood of debt repayment problems (Lusardi and Mitchell, 2007; Van Rooij et al., 2011a,b; Gathergood, 2012; Disney and Gathergood, 2013)

We include three questions relating to consumer credit, based on those used in a survey of US consumers by Lusardi and Tufano (2009). These test respondents' ability to make a simple interest calculation, show they understand interest compounding and can correctly evaluate the impact of minimum payments on a credit card contract. Each of the questions was framed in the context of a choice over a consumer credit product and focused on a core concept in consumer credit finance. The questions were constructed using a multiple-choice format. Only

the first question requires a simple per cent calculation to discriminate between two choices, answers in the other questions can be derived via elimination. From respondents' answers we construct a 'literacy score' for the number of questions answered correctly. The three questions are:

Simple Interest Question:

1. 'Cheryl owes £1,000 on her bank overdraft and the interest rate she is charged is 15% per year. If she didn't pay anything off, at this interest rate, how much money would she owe on her overdraft after one year?'
 - £850
 - £1,000
 - £1,150
 - £1,500
 - Do not know

Compound Interest Question:

2. 'Sarah owes £1,000 on her credit card and the interest rate she is charged is 20% per year compounded annually. If she didn't pay anything off, at this interest rate, how many years would it take for the amount she owes to double?'
 - Less than 5 years
 - Between 5 and 10 years
 - More than 10 years
 - Do not know

Minimum Payments Question:

3. 'David has a credit card debt of £3,000 at an Annual Percentage Rate of 12% (or 1% per month). He makes payments of £30 per month and does not gain any charges or additional spending on the card. How long will it take him to pay off this debt?'
 - Less than 5 years
 - Between 5 and 10 years
 - More than 10 years
 - None of the above, he will continue to be in debt
 - Do not know

We also include a statement in which respondents were asked to report the frequency of investing in understanding financial news and information by reading the financial press. We include this in our analysis as a measure of investment in financial understanding in addition to the financial literacy questions described above which, by contrast, measure accumulated understanding of financial concepts. We label this question 'read financial press' and assign a value of one if the respondent answers 'agree strongly' or 'tend to agree' and a value of zero otherwise:

Read financial press:

- 'I regularly read the personal finance pages in the press'
 - (a) Agree strongly
 - (b) Tend to agree
 - (c) Neither agree nor disagree
 - (d) Tend to disagree
 - (e) Disagree strongly
 - (f) Do not know

3.3 *Measure of Impulsiveness*

In addition to the financial literacy questions, we also include a survey instrument to elicit self-control problems on the part of the respondent. We use the approach of [Ameriks et al. \(2003\)](#) and [Ameriks et al. \(2007\)](#) by using Likert scale responses by which individuals associate or disassociate themselves with a short statement which describes impulsive behavior.

We adopt this approach, which is dependent upon self-awareness on the part of the respondent, so as to measure behavioral traits of which the respondent is aware. Self-awareness of self-control problems or other behavioral traits is central to the theory that individuals co-hold as a means of regulating their own behavior. We label this question ‘impulsive spending’ and assign a value of one if the respondent answers ‘agree strongly’ or ‘tend to agree’ and a value of zero otherwise:

Impulsive spender:

- ‘I am impulsive and tend to buy things even when I can’t really afford them’
 - (a) Agree strongly
 - (b) Tend to agree
 - (c) Neither agree nor disagree
 - (d) Tend to disagree
 - (e) Disagree strongly
 - (f) Do not know

3.4 *Measures of Income Risk & Credit Constraints*

We also draw upon a measure of income risk based on the self-reported likelihood of respondents facing unemployment in the near future. We label this question ‘expects to be unemployed’ and assign a value of one if the respondent answers ‘very likely’ or ‘fairly likely’ and a value of zero otherwise:

- ‘How likely or unlikely do you think it is that you will be made redundant or become unemployed over the next 6 months?’
 - (a) Very likely
 - (b) Fairly likely
 - (c) Neither likely or unlikely
 - (d) Fairly unlikely
 - (e) Very unlikely
 - (f) Do not know

In addition, we also incorporate a self-reported measure of the likelihood of needing to draw upon credit in the near future, possible answers and our coding of which are the same as for the income risk question above, which we label ‘likely to borrow more in future’:

- ‘In the near future how likely or unlikely is it that you will need to borrow any more money over the next 3 months?’

We create an indicator measuring the credit constraints a household faces in order to distinguish whether households are restrained in their borrowing capacity. This dummy takes the value one if respondents state ‘yes’ in response to either one of the following questions. We label this variable ‘credit constrained’:

- ‘Financial circumstances have got worse: can’t get credit’.
- ‘Credit card withdrawn’ or ‘credit limit reduced’ or ‘overdraft withdrawn’.
- Applied for a particular credit product and the outcome is either ‘credit amount was less than wanted’ or ‘turned down’.

3.5 *Characteristics of Co-holders*

From the summary statistics shown in [Table 1](#) co-holders are typically more likely to be married, in employment plus have a spouse or partner in employment and to be home-owners with mortgages, compared with the whole sample. They also have higher than average incomes (26% higher than the sample average and 35% higher than households who borrow but hold no liquid savings) and higher balances of both liquid savings and consumer credit. With respect to credit constraints, co-holders and borrowers are, on average, more likely to be restricted (12% and 22% compared to the sample average of 9%). Savers, and households belonging to the neither-nor group report below average rates of being credit constrained (4% and 7% respectively).

Co-holding households have on average higher financial literacy scores, and are more likely to report being an impulsive spender and reading the financial press. The mean literacy score (number of financial literacy questions answered correctly) is 1.90. 86% answer the first and simplest literacy question correctly, but only around half of the sample answer the other two questions correctly (57% and 47%, respectively). Around 10% fail to answer a single question correctly and 36% answer all three questions correctly. Compared to a sample of US consumers who answered similar questions ([Lusardi and Tufano, 2009](#)), respondents in the UK appear to be more financially literate: in the US only 36% and 34% respectively answered the last two question correctly. In a representative sample of Dutch households approximately three quarters answered a similar interest compounding question correctly ([Van Rooij et al., 2011a,b](#)).

Compared to US data, levels of liquid saving and consumer credit appear to be slightly higher and co-holding appears to be less prevalent, though some differences may be attributable to varying definitions and classifications of assets and debts across different datasets. Demographic characteristics of co-holders appear to be very similar in US data compared to the UK. They report average

rates of expected unemployment in line with those found in the whole sample and above average rates of expected additional future credit use, but below that of borrowers, who do not co-hold.

Compared to co-holders, savers are typically older and have higher incomes compared to borrowers. However, co-holding households exhibit an age profile similar to that of borrowers but have notably higher incomes and better financial literacy scores. The striking feature of [Table 1](#) is the observation that co-holders and savers are very similar in many aspects, but that co-holders exhibit impulsive spending behavior similar to that of borrowers.

More detailed summary statistics for households broken down by the level of household co-holding are presented in [Tables 2](#) and [3](#). [Table 2](#) reports summary statistics for co-holders by their amount of co-holding. In our sample, 350 households co-hold at least £100 of consumer credit debt together with £100 of liquid savings. Among these 326 hold more than £500 of each and 205 hold at least £1,500 of each. For households co-holding at least £1,500, the mean level of consumer credit is approximately £8,250, or three times monthly disposable income (assuming an average income tax plus mandatory social security contributions rate for these households of 30%).

Hence, approximately half of the co-holders in the sample exhibit large amounts of co-holding. Households in the categories with higher values of co-holding have typically higher income, are more likely to be in employment, more likely to hold mortgages and are more likely to have dependent children. They are also more likely to report being impulsive spenders and, on average, answer more of the financial literacy questions correctly.

[Table 3](#) reports summary statistics for co-holders by the interest cost of their co-holding. To calculate the interest cost of co-holding we first attach product-specific Annualized Percentage Interest Rates (APRS) to each product type held by households. Most households in the sample hold multiple consumer credit products. [Table 4](#) provides summary statistics for consumer credit portfolios of co-holding households. These product-specific APRS are derived from a monthly data series provided by the Financial and Leasing Association (FLA), the UK industry body for the consumer credit industry. They are representative APRS based on advertised rates offered by UK credit providers.

Assuming that households would pay down their most expensive consumer credit products first, we can calculate the annualized interest cost of co-holding for each household, again using our measure of co-holding which excludes £500 of liquid savings. Based on these calculations, on average the 350 co-holding households in our sample incur interest costs of £610 per annum which could be avoided if liquid savings were used to pay down credit balances. The distribution

of losses from co-holding is left-skewed: the median loss is lower at £375 with the 75th percentile at £747 and the 90th percentile at £1270. In total 107 households incur losses of more than £600 per annum.

The average balances for individual credit products among credit portfolios of co-holding households shown [Table 4](#) reveal much heterogeneity. As is evident from the table, portfolios of co-holding households contain a wide variety of credit products, not just credit card debt. While credit card debt is on average the largest credit product type, comprising 34% of the consumer credit debt portfolio of co-holding households with at least £1,500 of co-holding, personal loans and car loans also constitute sizeable amounts to the average portfolio.

4 ECONOMETRIC RESULTS

The summary statistics from the previous section indicate that co-holding households are more likely to report self-control problems and also exhibit higher levels of financial literacy, especially compared with borrowers. However, these households also differ in terms of demographic, income and other characteristics. We now present estimates from a series of multivariate econometric models which condition on these covariates.

We estimate a series of models which explain the indicator for co-holding (a dichotomous dummy variable) as a function of behavioral characteristics, financial literacy and controls. The general form of the models we estimate is given in [Equation 1](#):

$$ch = \alpha_0 + \beta_1 imp + \beta_2 fil + \beta_3 ref + \beta_4 org + \beta_5 dis + \mathbf{X}'\omega + u \quad (1)$$

where *ch* denotes a co-holding dummy, *imp* the impulsive dummy, *fil* the financial literacy score measured on a 0–3 scale, *ref* the dummy variable which indicates whether the individual reads the financial press, *org* the organized dummy and *dis* the heavy discounter dummy. The vector of control variables \mathbf{X} includes all of the covariates shown in [Table 1](#), further controls and omitted control groups being described in the notes of the result tables. As the dependent variable is a 1/0 dummy variable we estimate [Equation 1](#) using a probit model. Subsequently, we also estimate a Tobit model to explain the level of co-holding and the cost incurred among co-holders.

4.1 Probit Estimates

Our baseline estimates of [Equation 1](#) are estimated from the entire sample which includes co-holders, borrowers, savers and those in the ‘neither/nor’ category. There is much heterogeneity between these groups, as shown in the summary statistics in [Table 1](#), as there is no strong prior as to which group is a natural comparison group with co-holders against which to evaluate the impact of behavioral characteristics and financial literacy. Therefore, in order to obtain additional insight into how these characteristics impact upon the likelihood of co-holding as opposed to borrowing, saving or neither of the two we also estimate a series of models in which the sample comprises co-holders plus, respectively, borrowers, savers and those in the neither-nor category. We also estimate multinomial models over the whole sample.

Firstly, [Table 5](#) presents estimates from a series of probit models in which the 1/0 dependent variable indicates a discrete level of co-holding estimated from the whole sample. To allow for non-linearity in the relationship between age, education leaving age and co-holding age enters in four dummy variables which capture age bands and education leaving age in three banded dummy variables.

Turning first to covariates, estimates indicate no statistically significant age pattern in co-holding across all specifications, although the magnitude of the coefficients suggest co-holding is least likely among younger households in the age 18–24 bracket compared with the omitted group of middle-aged households (age 45–54). The coefficient for this bracket is negative and statistically significant at the 1% level in Column 3 (co-holding at least £1,500) and the magnitude of the marginal effect evaluated against the baseline predicted probability implies that young households are 127% less likely to co-hold £1,500. The interpretation of the age variables as age effects in our cross-section data is potentially invalid as we cannot distinguish age from cohort effects. The absence of any statistically significant pattern in the coefficients indicates neither age or cohort effects are apparent.

None of the demographic or education variables are significant in any of the specifications. The indicator variable for being employed is positive and statistically significant in the first and second specifications. The omitted group is households with respondents who are not in the labor force. The indicator variable for being a mortgaged home-owner is also positive and statistically significant in the first and second specifications for relative to the baseline group of renters.

For the measures of financial awareness, the coefficient on the financial literacy score is positive but not statistically significant in all specifications. This

indicates that there is no evidence for co-holding being associated with financial ignorance. The coefficient on the indicator variable which identifies whether the respondent reads the financial press is also positive and significant at the 5% level in the first two columns. The implied magnitude of the marginal effect when evaluated against the baseline probability implies a household with a household head who regularly reads the financial press is 19% more likely to co-hold at lower levels of co-holding.

The coefficient on the impulsive spender indicator variable is positive and statistically significant at the 1% level in each specification. The magnitude of the marginal effect evaluated against the baseline probability is 71% in Column 1, 75% in Column 2 and 80% in Column 3. Hence reporting impulsive spending behavior leads to a between one half to three quarters increase in the likelihood of exhibiting co-holding substantial balances of consumer credit and liquid savings simultaneously. The slightly larger effect in the models for higher values of co-holding suggests that impulsiveness in behavior is a stronger explanation for concentrations of co-holding at higher levels.

Importantly, the estimated coefficient on the heavy discounter variable in each specification is statistically not significant, indicating there is no evidence that co-holding is related to impatience. Also, the coefficient on the variable measuring unemployment expectations is negative in all specifications and statistically not significant in each case. The coefficient on the variable measuring expected future additional borrowing is positive in the first column, negative in the second and third columns and again statistically not significant in each case. Hence, there is also no evidence that expected future unemployment is associated with co-holding, or expected future expenditure changes which necessitate using credit. These results provide no evidence for labor income risk or anticipated dependency on credit inducing households to co-hold.

Table 6 presents additional estimates based on the models estimated in Table 5 but where the co-holding thresholds identify the extent of co-holding by the cost of interest charges incurred instead of the amount of co-holding. Results in Table 6 are very similar to those in Table 5. There is no strong age profile or education leaving age profile in co-holding and co-holding increases in likelihood with employment and mortgaged homeownership (though only at lower levels of co-holding as measured by co-holding cost).

The pattern in the estimated coefficients on the behavioral characteristics variables is also very similar to before. Co-holding at all levels of cost increases in likelihood with impulsiveness. The coefficients on the read financial press variable are also positive as before, though slightly weaker in their statistical significance. The magnitudes of the marginal effects on the impulsive spender

dummy variable are again large: the implied effects are 71% in Column 1, 57% in Column 2 and 77% in Column 3. As previously, neither the unemployment expectation variable nor the anticipated future borrowing variable are significant in these estimates.

We also re-estimate the specifications from [Table 5](#) to allow more flexibility in the relationship between financial literacy, impulsiveness and co-holding. We augment the specification with the financial literacy score entering as a series of dummy variables (literacy score = 1, literacy score = 2, literacy score = 3, omitted group literacy score = 0) instead of as a continuous 0–3 variable plus the impulsive spender measure entering as two dummy variables (impulsive = agree and impulsive = disagree, omitted group = neither agree nor disagree) instead of as a 1/0 dummy variable taking a value of one for agree and zero otherwise.

A subsample of estimated coefficients for the financial literacy and impulsiveness variables are shown in [Table 7](#). The additional control variables are again the same as those in [Table 5](#). As before, none of the literacy score variables are statistically significant at the 5% level or lower. The impulsive = agree variable is statistically significant at the 1% level of significance in each of the specification and the magnitude of the coefficients are very similar to before, whereas the impulsive = disagree variable is not significant in each specification.

4.2 *Tobit Estimates*

We now present results from estimated models which explain the extent of co-holding. Results from probit model estimates in the previous section established that impulsiveness increases the likelihood of co-holding with no evidence that co-holding is predicted by poor literacy and some evidence that it is predicted by good financial literacy behavior. [Table 8](#) presents results from two Tobit model where the dependent variable is the continuous level of co-holding of the household (Column 1) and the continuous interest cost incurred due to co-holding (Column 2). Hence households with no co-holding, either because they hold only borrowing, only liquid savings or report no borrowing or liquid savings, have a co-holding value of zero. The co-holding value is the minimum value of consumer credit or liquid savings. The set of covariates included in the model is identical to that in [Table 6](#), as is the inclusion of the variables capturing behavioral characteristics.

Results from estimated models in both columns are very similar and reveal the same pattern in the coefficients as those seen in the previous probit models. The likelihood of co-holding is increasing in employment and mortgaged homeownership. The coefficient on the financial literacy score is positive but

not statistically significant whereas the coefficient on the indicator variable for reading the financial press is positive and significant at the 5% level. Hence there is again no evidence that co-holding is associated with poor financial understanding on the part of the household.

The coefficient on the impulsive spender indicator variable is again positive and statistically significant at the 1% level. The coefficient value on the impulsive spender variable in Column 1 implies that impulsive spending, evaluated at the means of covariates, is associated with approximately £3,100 of co-holding consumer credit and liquid savings. The coefficient value on the impulsive spender variable in Column 2, again evaluate at the means of covariates, implies impulsive spending is associated with approximately £550 of interest costs due to co-holding. Again, as with the results in the previous tables, the coefficients on the unemployment expectation and credit use expectation variables are both statistically not significant as is the measure of credit constraints.

As before, we estimate all models where both literacy score and impulsiveness are included as dummies as further sensitivity analysis (results not shown). This alternative specification does not alter the results: in the case of financial literacy answering one, two or three questions correctly is not statistically significant relative to the omitted group of zero questions answered correctly; in the case of impulsiveness, strongly agreeing is significant at the one percent level and negative relative to the baseline of neither agreeing nor disagreeing.

4.3 *Comparisons between Groups*

The results presented so far show that impulsiveness is positively and significantly associated with co-holding. But these estimates do not allow us to conclude that impulsiveness is particularly associated with co-holding as distinct from indebtedness. It might be argued that the relationship we are recovering is one between impulsiveness and indebtedness and, as indebtedness is one aspect of co-holding, that explains the positive association between impulsiveness and co-holding. Summary statistics in [Table 1](#) show that both borrowers and co-holders have high levels of debt and are more likely to be impulsive.

However, the key distinction between borrowers and co-holders in the theoretical literature is that co-holders suffer from a particular problem of impulsiveness, are financially aware and hence undertake co-holding as a planned behavior as distinct from borrowers. To empirically distinguish co-holders from borrowers we re-estimate a further series of probit models in which we reconfigure the control group to be borrowers only. Hence the coefficient estimates on the behavioral variables predict the likelihood of a household co-holding compared

with borrowing, instead of co-holding compared with being any of the other household types as in the previous models.

If co-holding is a distinct planned behavior undertaken by financially aware individuals we would expect to find positive and statistically significant coefficients on the variables which proxy for planning behavior and financial awareness. We also estimate models for separate samples with the ‘neither/nor’ group and the savers group.

[Table 9](#) shows estimates from these additional specifications. In Column 1, where the control is borrowers the coefficients on the impulsive spender, financial literacy, reading financial press and organized about finance variables are all positive and statistically significant. Importantly, the coefficient on the heavy discounter variable is not statistically significantly different from zero, showing that co-holders are indistinct from borrowers in measured time preference, but not in impulsiveness. Also, the negative coefficient on the ‘likely to borrow in future variable’ shows that co-holding is not associated with perceived future credit constraints.

The estimation sample in Column 2 comprises co-holders and savers. As we might expect, the results show that impulsiveness strongly predicts co-holding in this sample (the marginal effect on the impulsive spender variable evaluated against the baseline predicted probability implies impulsive spenders are 82% more likely to be co-holders) and none of the behavioral characteristics related to financial understanding or planning behavior predict co-holding as opposed to saving. Hence, by these results, co-holders are more similar to savers in their financial understanding and planning behaviors though they are significantly different from borrowers.

[Table 10](#) shows results of models estimated using the same specifications and sample groups as those in [Table 1](#) using the measure of costly co-holding as the dependent variable. The pattern in the coefficient magnitudes on the behavioral variables across the different sample groups is very similar to those shown in [Table 9](#).

In addition to these estimates we also report estimates from an unordered multinomial probit model in [Table 11](#). Multinomial probit models explicitly model assignment into each of the groups in contrast to the estimates in [Tables 9](#) and [10](#) which only model the bivariate relationship between co-holding and one of the other group categories. The attraction of the multinomial model is that it allows us to model the impact of impulsiveness on borrowing behavior and then the difference in literacy between borrowers and co-holders. In the multinomial probit models the base is the neither-nor group and hence none of the covariates show significance as the coefficients are normalized to zero. The

results confirm the conclusions we drew from the estimations before: relative to the neither-nor group, impulsive households are significantly more likely to fall into the borrower or co-holder group, but less likely to be savers. With respect to financial sophistication, literate households are more likely to fall into the savers group as do households that read financial press, with the latter being also positive and statistically significant for co-holders.

These results based on comparisons between groups present empirical support for the notion that co-holding arises as an activity undertaken by households who tend to be impulsive in their spending but are sophisticated in their financial understanding such that they hold consumer credit balances as a means of controlling their behavior. There is no evidence that co-holding is associated with failure to realizing arbitrage opportunities due to, for example, being unable to make simple or compound interest calculations. The positive and statistically significant coefficients and implied effects on the impulsive spender indicator variable in all specifications imply differences in this behavior across respondents in part explain observed levels of co-holding.

5 CONCLUSION

The ‘co-holding puzzle’ is an apparent violation of a simple arbitrage opportunity on the part of households in their consumer finances has given rise to a puzzle in the household finance literature: why does a subset of households hold high cost consumer credit and low yield liquid savings simultaneously? This behavior has been rationalized as a form of money management for transactions purposes, or as a means of self-control among sophisticated but impulsive households. These two explanations both attempt to understand observed behavior as a rational response of households to a planning problem: in the first instance related to money management, in the second instance related to self-management.

We present empirical evidence from a UK household survey which incorporated a measure of impulsiveness and financial literacy in support of the latter explanation. Our results show co-holding is positively associated with self-reported impulsive spending on the part of respondents, which increases the probability of co-holding by between one half and two thirds. There is no evidence that respondents who report co-holding misunderstand central tenets of consumer finance such as interest rate calculation and interest compounding, hence co-holding is not explained by expected future income losses which might induce precautionary saving behavior on the part of the household in the face of perceived income risk. Co-holders, on average, self-report rates of expected

unemployment similar to non-co-holders and average rates of expected future additional credit use below those of borrowers, who do not co-hold liquid savings. The econometric analysis finds no evidence for future income- or expenditure risk increasing the likelihood of co-holding. We also incorporate measures of credit constraints which do not alter the results.

Our results suggest a challenge of understanding apparent puzzles in household financial management involves not only observing apparent violations of rational behavior on the part of households, but also understanding the types of mechanisms and facilities households might utilize to accommodate tenets of their behavior which prevent them from behaving in a purely rational manner. This approach might also prove effective in explaining other aspects of household financial behavior.

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TABLE 1: Sample Characteristics by Financial Market Participation

	Sample	Borrower	Saver	Neither Borrower nor Saver	Co-Holder
<i>Age</i>					
18–24	0.07	0.08	0.08	0.07	0.04
25–34	0.19	0.25	0.18	0.16	0.23
35–44	0.20	0.25	0.18	0.17	0.23
45–54	0.18	0.22	0.15	0.18	0.22
55+	0.36	0.21	0.41	0.43	0.29
<i>Demographics</i>					
Male (= 1)	0.50	0.42	0.53	0.50	0.55
Married / living as married (= 1)	0.67	0.67	0.64	0.67	0.78
Dependent children (= 1)	0.20	0.32	0.16	0.17	0.23
<i>Education</i>					
Education leaving age	18.92	18.57	19.32	18.59	19.13
<i>Employment</i>					
Employed (= 1)	0.59	0.68	0.55	0.51	0.73
Unemployed (= 1)	0.04	0.05	0.03	0.05	0.03
Retired/Student/Housewife/Disabled	0.37	0.27	0.42	0.43	0.24
Spouse employed (= 1)	0.43	0.48	0.37	0.41	0.58
<i>Housing</i>					
Homeowner without mortgage (= 1)	0.29	0.11	0.37	0.34	0.21
Homeowner with mortgage (= 1)	0.38	0.42	0.35	0.32	0.56
<i>Household Finances</i>					
Household income (£)	35300	32941	37891	29984	44435
Liquid savings (£)	9211	0	21577	0	10483
Consumer credit debt (£)	2036	6742	0	0	6553
Co-Holding (£)	462	0	0	0	3412
Credit constrained (= 1)	0.09	0.22	0.04	0.07	0.12
<i>Income and Expenditure Risk</i>					
Expects to be unemployed (= 1)	0.08	0.09	0.08	0.07	0.09
Likely to borrow more in future (= 1)	0.09	0.20	0.04	0.07	0.10
<i>Behavioural Characteristics</i>					
Literacy score (0–3)	1.90	1.70	2.12	1.71	2.02
Impulsive spender (= 1)	0.13	0.25	0.07	0.10	0.23
Heavy discounter (= 1)	0.09	0.17	0.06	0.07	0.13
Read financial press (= 1)	0.35	0.20	0.43	0.31	0.41
Organised about finance (= 1)	0.72	0.52	0.83	0.70	0.70
Observations	2584	440	933	861	350

Definitions:

'Borrower': Borrowing > 0, Saving = 0;

'Saver': Borrowing = 0, Saving > 0;

'Neither Borrowing nor Saver': Borrowing = 0, Saving = 0;

'Co-Holder': Borrowing > 0, Saving > 0.

TABLE 2: Sample Characteristics by the Amount of Co-Holding

	> £100	> £500	> £1500
<i>Age</i>			
18–24	0.04	0.03	0.01
25–34	0.23	0.22	0.18
35–44	0.23	0.23	0.25
45–54	0.22	0.21	0.22
55+	0.29	0.31	0.34
<i>Demographics</i>			
Male (= 1)	0.55	0.55	0.59
Married / living as married (= 1)	0.78	0.79	0.79
Dependent children (= 1)	0.23	0.23	0.27
<i>Education</i>			
Education leaving age	19.13	19.09	19.08
<i>Employment</i>			
Employed (= 1)	0.73	0.72	0.70
Unemployed (= 1)	0.03	0.03	0.03
Retired/Student/Housewife/Disabled	0.24	0.25	0.26
Spouse employed (= 1)	0.58	0.58	0.56
<i>Housing</i>			
Homeowner without mortgage (= 1)	0.21	0.22	0.24
Homeowner with mortgage (= 1)	0.56	0.56	0.56
Private Renter	0.21	0.20	0.19
<i>Household Finances</i>			
Household income (£)	44435	45087	48651
Liquid savings (£)	10483	10940	13711
Consumer credit debt (£)	6553	6660	8248
Credit constrained (= 1)	0.12	0.12	0.13
<i>Income and Expenditure Risk</i>			
Expects to be unemployed (= 1)	0.09	0.09	0.09
Likely to borrow more in future (= 1)	0.10	0.10	0.09
<i>Behavioural Characteristics</i>			
Literacy score (0–3)	2.02	2.03	2.06
Impulsive spender (= 1)	0.23	0.24	0.25
Heavy discounter (= 1)	0.13	0.13	0.16
Read financial press (= 1)	0.41	0.42	0.42
Organised about finance (= 1)	0.70	0.71	0.71
Observations	350	326	205

TABLE 3: Sample Characteristics by the Amount of Costly Co-Holding

	> £100	> £500	> £1000
<i>Age</i>			
18–24	0.04	0.01	0.02
25–34	0.23	0.19	0.16
35–44	0.23	0.30	0.29
45–54	0.22	0.20	0.20
55+	0.29	0.29	0.34
<i>Demographics</i>			
Male (= 1)	0.55	0.59	0.55
Married / living as married (= 1)	0.78	0.77	0.77
Dependent children (= 1)	0.23	0.30	0.23
<i>Education</i>			
Education leaving age	19.13	19.26	19.71
<i>Employment</i>			
Employed (= 1)	0.73	0.72	0.71
Unemployed (= 1)	0.03	0.03	0.05
Retired/Student/Housewife/Disabled	0.24	0.25	0.23
Spouse employed (= 1)	0.58	0.55	0.52
<i>Housing</i>			
Homeowner without mortgage (= 1)	0.21	0.20	0.25
Homeowner with mortgage (= 1)	0.56	0.60	0.48
Private Renter	0.21	0.19	0.23
<i>Household Finances</i>			
Household income (£)	44435	50407	56984
Liquid savings (£)	10483	13828	16491
Consumer credit debt (£)	6553	9887	12866
Credit constrained (= 1)	0.12	0.13	0.11
<i>Income and Expenditure Risk</i>			
Expects to be unemployed (= 1)	0.09	0.09	0.09
Likely to borrow more in future (= 1)	0.10	0.11	0.11
<i>Behavioural Characteristics</i>			
Literacy score (0–3)	2.02	2.03	1.95
Impulsive spender (= 1)	0.23	0.25	0.34
Heavy discounter (= 1)	0.13	0.17	0.18
Read financial press (= 1)	0.41	0.42	0.50
Organised about finance (= 1)	0.70	0.67	0.64
Observations	350	137	56

TABLE 4: Consumer Credit Portfolios for Co-Holders

	Co-Holding > £100	Co-Holding > £500	Co-Holding > £1500
<i>Consumer credit debt (£)</i>	6553	6660	8248
Credit Card (£)	2277	2368	2830
Store Card (£)	83	82	107
Personal Loan (£)	1864	1872	2321
Overdraft (£)	566	549	628
Hire-Purchase Agreement (£)	296	293	381
Car Loan (£)	1243	1268	1721
Mail Order Catalogue (£)	38	29	27
Other Loan (£)	174	187	215
Observations	350	326	205

TABLE 5: Probit Model for Characteristics of Co-Holders

	(1)		(2)		(3)	
	Co-Holder β / SE	Margin	Co-Holding > £500 β / SE	Margin	Co-Holding > £1500 β / SE	Margin
<i>Age</i>						
18–24	-0.220 (0.179)	-0.044	-0.286 (0.191)	-0.054	-0.839*** (0.313)	-0.101***
25–34	0.008 (0.109)	0.002	0.028 (0.112)	0.005	-0.101 (0.132)	-0.012
35–44	-0.061 (0.103)	-0.012	-0.049 (0.106)	-0.009	-0.062 (0.120)	-0.008
55+	-0.027 (0.108)	-0.005	0.032 (0.111)	0.006	0.179 (0.126)	0.022
<i>Demographics</i>						
Male (= 1)	0.091 (0.069)	0.018	0.098 (0.070)	0.018	0.117 (0.081)	0.014
Married / living as married (= 1)	0.021 (0.141)	0.004	-0.003 (0.145)	-0.001	-0.124 (0.168)	-0.015
Dependent children (= 1)	-0.087 (0.090)	-0.017	-0.080 (0.092)	-0.015	0.125 (0.104)	0.015
<i>Education Leaving Age</i>						
≤ 16	0.047 (0.091)	0.009	0.015 (0.093)	0.003	0.056 (0.108)	0.007
20–21	0.052 (0.104)	0.010	-0.058 (0.108)	-0.011	-0.102 (0.127)	-0.012
≥ 21	-0.061 (0.092)	-0.012	-0.090 (0.093)	-0.017	-0.058 (0.107)	-0.007
<i>Employment</i>						
Employed (= 1)	0.199** (0.089)	0.040**	0.176* (0.091)	0.033*	0.099 (0.106)	0.012
Unemployed (= 1)	-0.052 (0.193)	-0.010	-0.076 (0.201)	-0.014	0.070 (0.226)	0.008
<i>Housing</i>						
Homeowner without mortgage (= 1)	-0.015 (0.112)	-0.003	0.002 (0.114)	0.000	0.019 (0.132)	0.002
Homeowner with mortgage (= 1)	0.257*** (0.090)	0.051***	0.270*** (0.093)	0.051***	0.175 (0.109)	0.021
<i>Household Finances</i>						
Household income (£10,000s)	-0.028 (0.094)	-0.006	-0.044 (0.097)	-0.008	0.109 (0.111)	0.013
Household income ²	0.016 (0.014)	0.003	0.021 (0.015)	0.004	0.008 (0.016)	0.001
<i>Income and Expenditure Risk</i>						
Expects to be unemployed (= 1)	-0.057 (0.120)	-0.011	-0.036 (0.122)	-0.007	-0.051 (0.142)	-0.006
Likely to borrow more in future (= 1)	0.015 (0.116)	0.003	-0.016 (0.120)	-0.003	-0.019 (0.140)	-0.002
<i>Behavioural Characteristics</i>						
Literacy score (0–3)	0.037 (0.036)	0.007	0.041 (0.037)	0.008	0.042 (0.043)	0.005
Impulsive spender (= 1)	0.479*** (0.095)	0.096***	0.505*** (0.097)	0.095***	0.517*** (0.110)	0.063***
Heavy discounter (= 1)	0.096 (0.111)	0.019	0.101 (0.113)	0.019	0.159 (0.126)	0.019
Read financial press (= 1)	0.128* (0.070)	0.026*	0.121* (0.072)	0.023*	0.055 (0.083)	0.007
Organised about finance (= 1)	0.038 (0.077)	0.008	0.072 (0.079)	0.014	0.066 (0.092)	0.008
Observations	2584		2584		2584	
Pseudo R ²	0.070		0.074		0.094	
LR chi2	143.827		144.714		134.547	
Prob > chi2	0.000		0.000		0.000	
Baseline predicted probability	0.135		0.126		0.079	

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Note: Omitted groups are (1) *Employment*: Student/Housewife/Disabled; (2) *Housing*: Private renter/Social renter. Further controls for spouse employment status.

TABLE 6: Probit Model for Characteristics of Costly Co-Holders

	(1)		(2)		(3)	
	Co-Holding Cost > £100	Margin	Co-Holding Cost > £500	Margin	Co-Holding Cost > £1000	Margin
<i>Age</i>						
18–24	-0.220 (0.179)	-0.044	-0.545* (0.316)	-0.047*	-0.820* (0.450)	-0.025*
25–34	0.008 (0.109)	0.002	-0.047 (0.150)	-0.004	-0.364 (0.230)	-0.011
35–44	-0.061 (0.103)	-0.012	0.085 (0.132)	0.007	0.022 (0.190)	0.001
55+	-0.027 (0.108)	-0.005	0.152 (0.148)	0.013	0.180 (0.208)	0.005
<i>Demographics</i>						
Male (= 1)	0.091 (0.069)	0.018	0.131 (0.093)	0.011	0.015 (0.131)	0.000
Married / living as married (= 1)	0.021 (0.141)	0.004	-0.111 (0.189)	-0.010	0.025 (0.261)	0.001
Dependent children (= 1)	-0.087 (0.090)	-0.017	0.127 (0.115)	0.011	-0.016 (0.174)	-0.000
<i>Education Leaving Age</i>						
≤ 16	0.047 (0.091)	0.009	0.082 (0.125)	0.007	-0.115 (0.191)	-0.003
20–21	0.052 (0.104)	0.010	0.022 (0.141)	0.002	0.381** (0.179)	0.012**
≥ 21	-0.061 (0.092)	-0.012	-0.008 (0.122)	-0.001	-0.012 (0.178)	-0.000
<i>Employment</i>						
Employed (= 1)	0.199** (0.089)	0.040**	0.036 (0.121)	0.003	0.117 (0.177)	0.004
Unemployed (= 1)	-0.052 (0.193)	-0.010	-0.079 (0.270)	-0.007	0.226 (0.342)	0.007
<i>Housing</i>						
Homeowner without mortgage (= 1)	-0.015 (0.112)	-0.003	0.008 (0.154)	0.001	-0.112 (0.207)	-0.003
Homeowner with mortgage (= 1)	0.257*** (0.090)	0.051***	0.212* (0.123)	0.018*	-0.225 (0.177)	-0.007
<i>Household Finances</i>						
Household income (£10,000s)	-0.028 (0.094)	-0.006	0.127 (0.125)	0.011	-0.004 (0.185)	-0.000
Household income ²	0.016 (0.014)	0.003	0.004 (0.018)	0.000	0.034 (0.027)	0.001
<i>Income and Expenditure Risk</i>						
Expects to be unemployed (= 1)	-0.057 (0.120)	-0.011	-0.017 (0.157)	-0.001	-0.054 (0.228)	-0.002
Likely to borrow more in future (= 1)	0.015 (0.116)	0.003	0.065 (0.152)	0.006	0.026 (0.218)	0.001
<i>Behavioural Characteristics</i>						
Literacy score (0–3)	0.037 (0.036)	0.007	0.003 (0.049)	0.000	-0.082 (0.069)	-0.002
Impulsive spender (= 1)	0.479*** (0.095)	0.096***	0.354*** (0.123)	0.030***	0.549*** (0.162)	0.017***
Heavy discounter (= 1)	0.096 (0.111)	0.019	0.190 (0.138)	0.016	0.047 (0.199)	0.001
Read financial press (= 1)	0.128* (0.070)	0.026*	0.093 (0.094)	0.008	0.208 (0.133)	0.006
Organised about finance (= 1)	0.038 (0.077)	0.008	-0.041 (0.101)	-0.004	-0.107 (0.143)	-0.003
Observations	2584		2584		2584	
Pseudo R ²	0.070		0.093		0.157	
LR chi2	143.827		99.907		84.884	
Prob > chi2	0.000		0.000		0.000	
Baseline predicted probability	0.135		0.053		0.022	

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Note: Omitted groups are (1) *Employment*: Student/Housewife/Disabled; (2) *Housing*: Private renter/Social renter. Further controls for spouse employment status.

TABLE 7: Probit Model Sensitivity Check

	(1) Co-Holder		(2) Co-Holding > £500		(3) Co-Holding > £1500	
	β / SE	Margin	β / SE	Margin	β / SE	Margin
Literacy Score = 1	0.036 (0.131)	0.007	-0.028 (0.133)	-0.005	0.073 (0.161)	0.009
Literacy Score = 2	0.183 (0.130)	0.036	0.119 (0.131)	0.022	0.197 (0.159)	0.024
Literacy Score = 3	0.109 (0.133)	0.022	0.083 (0.133)	0.016	0.147 (0.161)	0.018
Impulsive = Agree	0.403*** (0.109)	0.080***	0.453*** (0.112)	0.085***	0.455*** (0.127)	0.055***
Impulsive = Disagree	-0.121 (0.086)	-0.024	-0.077 (0.089)	-0.015	-0.116 (0.104)	-0.014

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors in parentheses.

Note: Omitted groups are (1) *Financial Literacy*: Zero correct answers. *Impulsiveness*: Neither disagree nor agree. Further controls as in [Table 5](#).

TABLE 8: Tobit: Amount of Co-Holding and Costly Co-Holding

	(1) Tobit β / SE	(2) Tobit β / SE
<i>Age</i>		
18–24	–1801.583 (1194.815)	–361.327* (219.387)
25–34	–321.494 (718.787)	–43.030 (131.665)
35–44	–483.176 (672.571)	–95.537 (123.791)
55+	111.902 (712.470)	14.894 (130.857)
<i>Demographics</i>		
Male (= 1)	562.558 (452.360)	96.305 (83.069)
Married / living as married (= 1)	314.330 (918.242)	19.143 (169.484)
Dependent children (= 1)	–172.606 (588.080)	–45.225 (108.168)
<i>Education Leaving Age</i>		
≤ 16	337.984 (603.747)	31.566 (110.913)
20–21	411.942 (684.146)	69.618 (125.502)
≥ 21	–188.804 (601.356)	–44.057 (110.314)
<i>Employment</i>		
Employed (= 1)	1251.682** (591.923)	231.494** (108.673)
Unemployed (= 1)	–88.426 (1270.687)	–39.436 (234.425)
<i>Housing</i>		
Homeowner without mortgage (= 1)	–145.090 (738.748)	–36.025 (135.393)
Homeowner with mortgage (= 1)	1457.841** (597.590)	234.700** (109.500)
<i>Household Finances</i>		
Household income (£10,000s)	–151.152 (607.647)	–34.221 (112.471)
Household income ²	134.506 (89.644)	25.604 (16.745)
Household income ³	–6.540* (3.850)	–1.291* (0.728)
<i>Income and Expenditure Risk</i>		
Expects to be unemployed (= 1)	–538.142 (789.873)	–95.445 (144.809)
Likely to borrow more in future (= 1)	53.188 (761.613)	–2.852 (139.643)
<i>Behavioural Characteristics</i>		
Literacy score (0–3)	205.230 (239.420)	29.546 (43.915)
Impulsive spender (= 1)	3136.161*** (625.820)	547.478*** (114.720)
Heavy discounter (= 1)	663.088 (718.959)	191.679 (130.693)
Read financial press (= 1)	914.039** (460.950)	157.975* (84.832)
Organised about finance (= 1)	153.225 (503.429)	–14.164 (92.046)
Observations	2584	2584
Pseudo R ²	0.020	0.022
LR chiz / F	165.978	156.687
Prob > chiz / Prob > F	0.000	0.000
Baseline Co-Holding (£)	462.148	462.148

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Dependent Variable: (1) Minimum amount of co-Holding with lower limit of £0, (2) Amount of costly co-holding with lower limit of £0.

Note: Omitted groups are (1) *Employment:* Student/Housewife/Disabled; (2) *Housing:* Private renter/Social renter. Further controls for spouse employment status.

TABLE 9: Probit Models of Co-Holders vs. Different Comparison Groups

	(1)		(2)		(3)	
	Comparison Group: Borrower		Comparison Group: Saver		Comparison Group: Neither-Nor	
	β / SE	Margin	β / SE	Margin	β / SE	Margin
<i>Age</i>						
18–24	-0.407 (0.268)	-0.158	-0.374 (0.236)	-0.115	-0.254 (0.238)	-0.081
25–34	-0.047 (0.164)	-0.018	-0.008 (0.143)	-0.002	0.069 (0.144)	0.022
35–44	-0.040 (0.153)	-0.016	-0.013 (0.133)	-0.004	-0.034 (0.136)	-0.011
55+	0.148 (0.171)	0.057	-0.020 (0.139)	-0.006	0.001 (0.140)	0.000
<i>Demographics</i>						
Male (= 1)	0.191* (0.109)	0.074*	0.099 (0.087)	0.031	0.035 (0.088)	0.011
Married / living as married (= 1)	-0.355* (0.208)	-0.138*	0.146 (0.179)	0.045	0.009 (0.186)	0.003
Dependent children (= 1)	-0.403*** (0.129)	-0.157***	0.000 (0.115)	0.000	0.022 (0.122)	0.007
<i>Education Leaving Age</i>						
≤ 16	-0.080 (0.138)	-0.031	0.053 (0.117)	0.016	0.070 (0.115)	0.022
20–21	0.247 (0.174)	0.096	-0.254* (0.131)	-0.078*	-0.001 (0.141)	-0.000
≥ 21	0.131 (0.144)	0.051	-0.230** (0.114)	-0.071**	-0.089 (0.118)	-0.028
<i>Employment</i>						
Employed (= 1)	-0.063 (0.142)	-0.025	0.256** (0.114)	0.079**	0.199* (0.114)	0.063*
Unemployed (= 1)	-0.158 (0.296)	-0.061	0.044 (0.265)	0.014	-0.244 (0.239)	-0.078
<i>Housing</i>						
Homeowner without mortgage (= 1)	0.656*** (0.182)	0.255***	-0.222 (0.140)	-0.068	-0.019 (0.139)	-0.006
Homeowner with mortgage (= 1)	0.460*** (0.133)	0.179***	0.182 (0.116)	0.056	0.285** (0.118)	0.091**
<i>Household Finances</i>						
Household income (£10,000s)	0.006 (0.153)	0.002	-0.027 (0.113)	-0.008	-0.079 (0.142)	-0.025
Household income ²	0.022 (0.024)	0.009	0.010 (0.017)	0.003	0.036 (0.024)	0.011
<i>Income and Expenditure Risk</i>						
Expects to be unemployed (= 1)	0.133 (0.179)	0.052	-0.143 (0.152)	-0.044	0.001 (0.157)	0.000
Likely to borrow more in future (= 1)	-0.396*** (0.151)	-0.154***	0.286* (0.171)	0.088*	0.112 (0.156)	0.036
<i>Behavioural Characteristics</i>						
Literacy score (0–3)	0.130** (0.057)	0.051**	-0.050 (0.047)	-0.015	0.127*** (0.045)	0.041***
Impulsive spender (= 1)	0.273** (0.130)	0.106**	0.739*** (0.130)	0.227***	0.627*** (0.126)	0.200***
Heavy discounter (= 1)	-0.052 (0.150)	-0.020	0.279* (0.152)	0.086*	0.052 (0.150)	0.017
Read financial press (= 1)	0.326*** (0.114)	0.127***	0.003 (0.086)	0.001	0.191** (0.091)	0.061**
Organised about finance (= 1)	0.418*** (0.110)	0.162***	-0.164 (0.102)	-0.050	0.126 (0.099)	0.040
Observations	766		1259		1187	
Pseudo R ²	0.178		0.112		0.132	
LR chi2	185.598		161.988		184.893	
Prob > chi2	0.000		0.000		0.000	
Baseline predicted probability	0.482		0.276		0.281	

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Dependent Variable: Co-Holding dummy for any positive amount of co-holding.

Note: Omitted groups are (1) *Employment:* Student/Housewife/Disabled; (2) *Housing:* Private renter/Social renter. Further controls for spouse employment status.

TABLE 10: Probit Models of Costly Co-Holders vs. Different Comparison Groups

	(1)		(2)		(3)	
	Comparison Group: Borrower		Comparison Group: Saver		Comparison Group: Neither-Nor	
	β / SE	Margin	β / SE	Margin	β / SE	Margin
<i>Age</i>						
18–24	-0.332 (0.253)	-0.131	-0.288 (0.222)	-0.092	-0.174 (0.223)	-0.057
25–34	-0.071 (0.160)	-0.028	-0.031 (0.139)	-0.010	0.051 (0.140)	0.017
35–44	-0.041 (0.149)	-0.016	-0.025 (0.130)	-0.008	-0.051 (0.133)	-0.017
55+	0.096 (0.167)	0.038	-0.073 (0.136)	-0.023	-0.061 (0.137)	-0.020
<i>Demographics</i>						
Male (= 1)	0.187* (0.107)	0.073*	0.088 (0.086)	0.028	0.025 (0.086)	0.008
Married / living as married (= 1)	-0.319 (0.200)	-0.126	0.170 (0.174)	0.054	0.052 (0.181)	0.017
Dependent children (= 1)	-0.403*** (0.126)	-0.159***	-0.012 (0.113)	-0.004	0.014 (0.119)	0.005
<i>Education Leaving Age</i>						
≤ 16	-0.056 (0.135)	-0.022	0.093 (0.116)	0.030	0.109 (0.113)	0.036
20–21	0.428*** (0.166)	0.168***	-0.170 (0.127)	-0.054	0.113 (0.136)	0.037
≥ 21	0.174 (0.141)	0.068	-0.203* (0.113)	-0.064*	-0.056 (0.116)	-0.019
<i>Employment</i>						
Employed (= 1)	-0.044 (0.139)	-0.017	0.275** (0.112)	0.087**	0.225** (0.111)	0.074**
Unemployed (= 1)	-0.153 (0.285)	-0.060	0.120 (0.253)	0.038	-0.215 (0.230)	-0.071
<i>Housing</i>						
Homeowner without mortgage (= 1)	0.624*** (0.179)	0.245***	-0.238* (0.138)	-0.076*	-0.038 (0.136)	-0.013
Homeowner with mortgage (= 1)	0.437*** (0.128)	0.172***	0.166 (0.113)	0.053	0.271** (0.114)	0.089**
<i>Household Finances</i>						
Household income (£10,000s)	0.038 (0.149)	0.015	-0.002 (0.111)	-0.001	-0.063 (0.142)	-0.021
Household income ²	0.014 (0.023)	0.005	0.005 (0.016)	0.001	0.031 (0.025)	0.010
<i>Income and Expenditure Risk</i>						
Expects to be unemployed (= 1)	0.125 (0.176)	0.049	-0.174 (0.149)	-0.055	-0.027 (0.154)	-0.009
Likely to borrow more in future (= 1)	-0.351** (0.145)	-0.138**	0.328** (0.165)	0.104**	0.140 (0.150)	0.046
<i>Behavioural Characteristics</i>						
Literacy score (0–3)	0.125** (0.055)	0.049**	-0.058 (0.047)	-0.019	0.124*** (0.044)	0.041***
Impulsive spender (= 1)	0.233* (0.127)	0.092*	0.707*** (0.128)	0.225***	0.592*** (0.123)	0.195***
Heavy discounter (= 1)	-0.086 (0.146)	-0.034	0.275* (0.149)	0.088*	0.052 (0.147)	0.017
Read financial press (= 1)	0.329*** (0.111)	0.129***	-0.002 (0.084)	-0.001	0.197** (0.090)	0.065**
Organised about finance (= 1)	0.375*** (0.107)	0.147***	-0.201** (0.099)	-0.064**	0.091 (0.096)	0.030
Observations	790		1283		1211	
Pseudo R ²	0.163		0.113		0.127	
LR chi2	176.534		170.552		185.544	
Prob > chi2	0.000		0.000		0.000	
Baseline predicted probability	0.498		0.292		0.296	

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Dependent Variable: Co-Holding dummy for any positive amount of co-holding.

Note: Omitted groups are (1) *Employment:* Student/Housewife/Disabled; (2) *Housing:* Private renter/Social renter. Further controls for spouse employment status.

TABLE 11: Multinomial Probit Model (Marginal Effects)

	(1) Outcome: Borrower Margin / SE	(2) Outcome: Saver Margin / SE	(3) Outcome: Neither-Nor Margin / SE	(4) Outcome: Co-Holder Margin / SE
<i>Age</i>				
18-24	-0.011 (0.034)	0.082 (0.051)	-0.017 (0.049)	-0.054 (0.039)
25-34	-0.002 (0.024)	0.056 (0.036)	-0.054 (0.035)	-0.001 (0.024)
35-44	-0.007 (0.023)	0.012 (0.035)	0.009 (0.034)	-0.013 (0.023)
55+	-0.030 (0.024)	0.033 (0.034)	0.004 (0.033)	-0.007 (0.024)
<i>Demographics</i>				
Male (= 1)	-0.048*** (0.016)	-0.002 (0.021)	0.033 (0.021)	0.017 (0.015)
Married / living as married (= 1)	0.082*** (0.028)	-0.077* (0.042)	-0.014 (0.041)	0.009 (0.031)
Dependent children (= 1)	0.069*** (0.019)	-0.006 (0.030)	-0.049 (0.030)	-0.014 (0.020)
≤ 16	0.035* (0.020)	-0.029 (0.029)	-0.020 (0.027)	0.014 (0.020)
20-21	-0.082*** (0.025)	0.088*** (0.033)	-0.018 (0.033)	0.013 (0.023)
≥ 21	-0.043** (0.021)	0.061** (0.029)	-0.005 (0.028)	-0.013 (0.020)
<i>Employment</i>				
Employed (= 1)	0.067*** (0.019)	-0.073*** (0.027)	-0.036 (0.026)	0.042** (0.020)
Unemployed (= 1)	0.036 (0.038)	-0.124** (0.057)	0.097 (0.052)	-0.009 (0.042)
<i>Housing</i>				
Homeowner without mortgage (= 1)	-0.141*** (0.024)	0.129*** (0.033)	0.018 (0.032)	-0.006 (0.024)
Homeowner with mortgage (= 1)	-0.055*** (0.019)	0.040 (0.029)	-0.036 (0.028)	0.050** (0.020)
Household income (£10,000s)	-0.006 (0.021)	-0.023 (0.029)	0.040 (0.030)	-0.012 (0.021)
Household income ²	-0.001 (0.003)	0.009* (0.005)	-0.012 (0.005)	0.005 (0.003)
Household income ³	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
<i>Behavioural Characteristics</i>				
Literacy score (0-3)	-0.012 (0.008)	0.060*** (0.011)	-0.057 (0.011)	0.009 (0.008)
Impulsive spender (= 1)	0.067*** (0.021)	-0.116*** (0.036)	-0.065 (0.034)	0.115*** (0.021)
Heavy discounter (= 1)	0.060** (0.023)	-0.070* (0.039)	-0.017 (0.037)	0.027 (0.024)
Read financial press (= 1)	-0.038** (0.017)	0.064*** (0.022)	-0.055 (0.022)	0.029* (0.015)
Organised about finance (= 1)	-0.085*** (0.016)	0.134*** (0.025)	-0.052 (0.024)	0.003 (0.017)
<i>Income and Expenditure Risk</i>				
Expects to be unemployed (= 1)	-0.045* (0.027)	0.066* (0.039)	-0.008 (0.039)	-0.013 (0.026)
Likely to borrow more in future (= 1)	0.123*** (0.023)	-0.135*** (0.042)	-0.011 (0.038)	0.023 (0.026)
Observations	2584	2584	2584	2584
Baseline predicted probability	0.170	0.361	0.334	0.135

* p < 0.1, ** p < 0.05, *** p < 0.01. Standard errors in parentheses.

Base Group: Outcome 'Neither-Nor'.

Note: Omitted groups are (1) *Employment*: Student/Housewife/Disabled; (2) *Housing*: Private renter/Social renter. Further controls for spouse employment status.