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Self-Control, Financial Literacy and the Co-Holding Puzzle

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Abstract

We use UK household survey data incorporating measures of financial literacy and behavioural characteristics to analyse 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 20% of households in our sample co-hold, on average, £6,500 of revolving consumer credit alongside £8,000 of liquid savings. Co-holders are typically more financially literate, with above average income and education. However, we show co-holding is also associated with impulsive spending behaviour on the part of the household. Our results lend empirical support to theoretical models in which sophisticated households co-hold as a means of managing a self-control problem.

Keywords: Consumer credit, Self-control, Financial literacy

JEL Classification: D03 D10 D12 E21

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1. Introduction

Why do consumers simultaneously hold high cost consumer credit and low yield liquid savings? Telyukova (2011) analyses the 2001 U.S. Survey of Consumer Finances and finds 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. We analyse data from a representative sample of UK households and find 20% of households hold, on average, £6,500 of revolving consumer credit of various types while at the same time holding, on average, £8,000 of liquid savings. We provide new empirical evidence for a behavioural explanation of this apparent puzzle in consumer finance.

Such behaviour appears a violation of simple arbitrage: households could make substantial savings in the cost of debt servicing, or pay off their outstanding consumer credit entirely, by simply using their liquid savings to pay down their consumer debts. In some other cases the coincidence of higher-cost debt and lower-yield assets in household balance sheets might be easily rationalised. For example, households who hold retirement savings at the same time as higher cost debts might do so because their tenure-based occupational pension plans or retirement savings products penalise or prohibit withdrawals. Indeed, for some households mandatory contributions to low-yield social security programs force them to save in low yield investments early in life instead of saving towards mortgage downpayments or paying down other debts (Hurst and Willen, 2007).

This co-holding puzzle was first documented by Gross and Souleles (2002) in their analysis of lender provided credit card data, hence they termed their finding the 'credit card puzzle'. Angeletos et al. (2001) and Laibson et al. (2001) show that conventional buffer-stock models calibrated using estimated income processes cannot rationalise simultaneous co-holding of liquid savings and unsecured high-cost credit. However, as we show, 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, bank overdrafts and payday loans. Hence co-holding households hold complex portfolios of consumer credit debt at varying rates of interest across a range of products all of which are more expensive than the equivalent return on liquid savings.

There are two main explanations for this apparent puzzle in the existing literature. The first focuses on liquidity management and rationalises co-holding credit card debt on the basis that households need to hold liquid balances to undertake transactions for which credit cards cannot be used. Telyukova and Wright (2008) and Telyukova (2011) argue that there are certain classes of consumption purchases for which consumer credit products cannot be used, and households hold liquid savings, possibly on a precautionary basis, to facilitate such transactions should they arise. Hence the co-holding puzzle, in their explanation, is an extension of the classic rate of return dominance puzzle in monetary economics. The choice to hold high cost credit and liquid savings becomes analogous to the choice to hold cash instead of bonds in models of money demand. They cite medical expenses and housing payments as examples of such expenditures which cannot be paid for using credit. Their explanation is dependent upon consumers facing sizeable volumes of purchases for which credit cards cannot be used. Their model does not explain why households might revolve other forms of consumer credit.

The second explanation focuses on consumer behaviour and financial management. If consumers suffer from impulsive spending habits or the temptation to consume against their better financial judgement, they might deliberately hold outstanding consumer credit balances so as to limit opportunities for them to indulge in their impulsiveness. Savings balances cannot be used for transaction purposes and may also be perceived as non-spendable on immediate consumption. Hence, co-holding is a means of consumers protecting themselves against time-inconsistency in their own decision making. This means of self-control is similar to the planner-doer framework of Shefrin and Thaler (1988) and has recently been expanded in the model of Bertaut et al. (2009). By this rationalisation, co-holding behaviour is actually a response of a sophisticated consumer to the realisation of their impulsive spending tendencies.

We present new survey evidence from a sample of UK households on the relationship between financial sophistication, impulsive spending behaviour and co-holding. Our survey draws upon a representative sample of UK consumers on their household finances, together with a range of demographic and socio-economic variables. From the survey data we are able to identify values of co-holding for households based on reported consumer credit balances and access to liquid savings. We include a measure of self-control based on the notion of being an impulsive spender. Also incorporated into the survey were a series of financial literacy questions, by which

we measure the financial sophistication of respondents. We then relate our measures of financial sophistication and behavioural traits to observed levels of co-holding among respondents. This allows us to explore whether co-holding is more prevalent among respondents who are aware of and report difficulties restraining their expenditure, and also allows us to condition on the level of financial sophistication of respondents to control for the possibility that co-holding arising due to misunderstanding the terms of consumer credit, for example misunderstanding the calculation of interest rates and hence not realising that co-holding is a costly activity.

We make the following new contributions to the literature: Firstly, we find that co-holding is prevalent among approximately one fifth of the households in our sample of UK consumers, many of whom hold many 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 items which take the form of credit card products, instalments loans, flexible options such as overdrafts and informal lending such as loans from families and friends. Co-holding households hold a range of credit items which could be repaid or pre-paid, together with instalment loans on which pre-payment may not be possible or may be costly.

Secondly, we find co-holding households do not appear to be unsophisticated compared to non-co holding households in the sample. Households in the co-holding group are typically more educated, more likely to have both household head and his/her 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 financial literacy questions we use to measure financial sophistication. However, they are also much more likely to report they are impulsive in their spending decisions and exhibit self-control problems in their spending. Hence co-holding households appear to 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 sophistication and measures of behavioural 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 sophistication and impulsiveness of the 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. 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 behaviour 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.

Our results show a sizeable relationship between behavioural traits and co-holding among households in our sample, suggesting that there is empirical support for a behavioural explanation of the co-holding puzzle. As such, this paper contributes to the behavioural explanation for co-holding as 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 (Agarwal et al., 2006, 2009; Bernheim, 1995; Campbell, 2006). Our results are also relevant to the literature of financial literacy and individual behaviour (Bernheim, 1998; Lusardi, 2008; Jappelli, 2010) and more generally to the literature on the role of self-control problems in shaping individual behaviour related to financial decision making (Strotz, 1955; Laibson, 1997; Thaler and Shefrin, 1981; Gul and Pesendorfer, 2001; Benhabib and Bisin, 2005; Fudenberg and Levine, 2006; Heidhues and Koszegi, 2010).

2. Data

Our data is drawn from the YouGov Debt Tracker survey of household finances, also used in Gathergood (2012) and Disney and Gathergood (2011). The YouGov DebtTrack is a quarterly cross-section survey of a representative sample of approximately 3,000 UK households conducted via the Internet. We exclude retired households from our analysis sample as decline in financial sophistication and changes in behaviour may be driven by a more general decline in cognitive ability of the part of respondents.

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, labour market and financial product use topics. In addition to these, we commissioned YouGov to include a series of financial literacy questions relating to concepts in consumer credit and behaviour of respondents. As these additional questions together with the data on household consumer credit use and liquid savings are particularly relevant for this study, we describe them now in more detail.

2.1 Financial Literacy Questions

Our survey included three financial literacy questions, responses to which are used as a measure of financial sophistication 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 core concepts Lusardi (2008). The literature has documented that understanding of core 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 (Gathergood, 2012; Lusardi and Mitchell, 2007; van Rooij et al., 2011a,b).

We include three questions relating to consumer credit. 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 such they that did not require precise calculation of numerical answers. From respondents' answers we construct a 'literacy score' for the number of questions answered correctly. The three questions were as follows:

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

2.2 Measures of Behavioural Traits

In addition to the financial literacy questions, we also included 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 behaviour. We adopt

this approach, which is dependent upon self-awareness on the part of the respondent, so as to measure behavioural traits of which the respondent is aware. Self-awareness of self-control problems or other behavioural traits is central to the notion that individuals co-hold as a means of regulating their own behaviour. The impulsiveness statement included in the survey was:

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) Don't know

In addition, we included a second statement by which respondents were asked to report the frequency with which they invest in understanding financial news and information by reading the financial press. We include this as a measure of investment in financial understanding in addition to the financial literacy questions described above which measure accumulated understanding of financial concepts:

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) Don't know

We take responses to both these statements and transform the likert scale responses into indicator variables which take a value of 1 if the respondent answered 'tend to agree' or 'agree strongly' and a value of 0 otherwise.

2.3 Measures 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 the household. Respondents were asked to state the value of outstanding debt for each product, excluding balances which would be repaid within the current payment period (i.e. 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.

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 specific types of saving product and investment. Hence the value of liquid savings we use is based on the respondents' own judgement 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.'

2.4 Measures of Income Risk

We also draw upon a measure of income risk based on self-reported likelihood of facing unemployment in the near future. The particular wording of the question and possible answers are:

- '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) Don't know

We generate a 1/0 dummy variable which takes the value 1 if the respondent chose 'very likely' or 'fairly likely' and takes the value 0 otherwise. In addition to this, we also use 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:

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

3. Results

Summary statistics for our sample of households are provided in Table 1. Column 1 reports mean values for the whole sample of 2,196 households. Approximately half of all respondents are male, two thirds married and one quarter with children. Three quarters of households have a respondent in employment, with one half having the respondent's spouse or partner in full-time employment. Approximately two thirds of households are homeowners. Mean household income is around £40,000 with, on average, households holding a little below £9,000 in liquid savings and £2,600 of consumer credit debt. The mean literacy score (number of financial literacy questions answered correctly) is 1.93. In the whole sample 15% of respondents identified themselves as being impulsive. 32% of respondents stated they regularly read the financial press.

The remaining columns in the table classify all households in the sample into four categories: 'borrowers' (19%) with outstanding consumer credit debt but no liquid savings, 'savers' (33%) with liquid savings but no outstanding consumer credit debt, 'neither borrowers nor savers' (29%) who report zero liquid savings plus zero consumer credit debt and finally 'co-holders' (19%) who report non-zero liquid saving plus non-zero consumer credit debt. From the summary statistics co-holders are typically more likely to be married, in employment plus have a spouse or partner in employment and homeowners with mortgages. They also have higher than average incomes (13% higher than the sample average and 30% higher than households who borrow but hold no liquid savings) and higher balances of both liquid savings and consumer credit.

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. 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. Across the four categories generally the differences are most marked between co-holders and households who borrow but do not co-hold liquid savings. Much of this variation across household types is explained by life-cycle characteristics. 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.

More detailed summary statistics by the level of household co-holding are presented in Table 2. In our sample 393 households co-hold at least £100 of consumer credit debt together with £100 of liquid savings. Among these 284 hold more than £500 of each and 182 hold at least £1,500 of each. For households co-holding at least £1,500, the mean level of co-holding is approximately £8,700, 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 sizeable amounts of co-holding. Households in the categories with higer values of co-holding are typically higher income, more likely to be in employment, more likely to hold mortgages and are more likely to have dependent children. They are also both more likely to report being impulsive spenders and, on average, answer more of the financial literacy questions correctly.

Average balances for individual credit products among credit portfolios of co-holding households are given in Table 3. As is evident form the table, portfolios of co-holding households contain a wide variety of credit products, not just credit card debt. While credit card debt, on average, is 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. Many of these items could be pre-paid without penalty, such as car loans, overdraft debt and store card balances.

3.1 Econometric Results

The summary statistics indicate that co-holding households are more likely to report self-control problems and also exhibit higher levels of financial sophistication. However, these households

also differ in terms of demographic and income-related characteristics. We now present estimates from a series of econometric models which condition on these covariates. Our approach is to estimate a series of models in which the dependent variable is an indicator for co-holder, a series of indicator variables for the extent of co-holding and finally a Tobit model for the level of co-holding. We include a broad range of controls (with income and education entering as higher order polynomials) together with our measures of financial sophistication, investment in financial knowledge and indicator of impulsiveness.

Firstly, Table 4 presents estimates from a series of Probit models in which the 1/0 dependent variable indicates a level of co-holding. 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 to 24 bracket compared with the omitted group of middle-aged households (age 45 to 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. 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 each specification (the omitted group is households with respondents who are not in the labour force) and the indicator variable for being a mortgaged home-owner is positive and statistically significant in the second and third column specifications for higher levels of co-holding relative to the baseline group of renters.

Turning to the behavioural characteristics, the coefficient on the financial literacy score is positive in all specifications, but not statistically significant in column 1 and 3. Literacy is statistically significant at the 10% level in column 2. The magnitude of the marginal effect evaluated against the baseline predicted probability implies that a household with a one point higher literacy score is 11% more likely to co-hold at least £500 (column 2). This suggests a small effect, but 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 slightly more significant at the 5% level in the specification in column 1 and at the 10% level in column 2, respectively, for holding lower levels of co-holding.

The implied magnitude of the marginal effect when evaluated against the baseline probability is 21% in column 1 and 22% in column 2.

The coefficient on the impulsive spender indicator variable is positive and statistically significant at the 1% level in all specifications. The magnitude of the marginal effect again evaluated against the baseline probability is 54% in column 1, 68% in column 2 and 77% in column 3. Hence respondents reporting they are impulsive in their spending behaviour are between one half to three quarters more likely to exhibiting co-holding of substantial balances of consumer credit and liquid savings simultaneously. The larger effect in the models for higher values of co-holding suggests that impulsiveness in behaviour is a stronger explanation for concentrations of co-holding at higher levels.

Table 5 presents further Probit estimates for levels of co-holding in models which incorporate the measures of income and expenditure risk as additional covariates. The coefficient on the variable measuring unemployment expectations is negative in the specifications in columns 1 and 3, positive in the specifications shown in the second column, and is 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 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 labour income risk or anticipated dependency on credit inducing households to co-hold.

Table 6 presents results from a Tobit model for co-holding in which the dependent variable is the level of co-holding of the household. 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 for households with positive balances on both consumer credit and liquid savings is the minimum value of consumer credit or savings. The set of covariates included in the model is identical to that in Table 5, as is the inclusion of the variables capturing behavioural characteristics.

Results reveal a similar pattern in the coefficients to those seen in the Probit models in Tables 4 and 5. The likelihood of co-holding is lower for young households in the 18 to 24 age range and increasing in employment. 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 1% 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 magnitude implies impulsive spending, evaluated at the means of covariates, is associated with approximately £2,000 of co-holding consumer credit and liquid savings. As with the results in Table 5, the coefficients on the unemployment expectation and credit use expectation variables are both statistically not significant.

These results 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 behaviour. There is no evidence that co-holding is associated with failure to realising that arbitrage opportunities exists 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 behaviour across respondents in part explains observed levels of co-holding.

4. Conclusion

The 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 do a subset of households hold high cost consumer credit and low yield liquid savings simultaneously? This behaviour has been rationalised 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 behaviour 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 sophistication 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. Our results suggest a challenge of understanding apparent puzzles in household financial management involves not only observing apparent violations of rational behaviour on the part of households but also understanding the types of mechanisms and facilities households might utilise to accommodate tenets of their behaviour which prevent them from behaving in a purely rational manner.

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Table 1: Sample Characteristics by Financial Market Participation

	Sample	Borrower	Saver	Neither Borrower nor Saver	Co-Holder
Age					
18-24	0.08	0.08	0.10	0.09	0.05
25-34	0.24	0.27	0.24	0.21	0.28
35-44	0.24	0.26	0.23	0.23	0.25
45-54	0.22	0.23	0.20	0.23	0.23
55+	0.21	0.16	0.23	0.25	0.19
Demographics					
Male (= 1)	0.48	0.43	0.49	0.48	0.49
Married / living as married (= 1)	0.66	0.66	0.64	0.65	0.72
Dependent children (= 1)	0.24	0.34	0.21	0.22	0.24
Education					
Education leaving age	19.27	18.67	19.85	18.98	19.31
Financial education in school (1-4)	1.47	1.44	1.56	1.40	1.49
Employment					
Employed (= 1)	0.75	0.72	0.76	0.69	0.83
Unemployed (= 1)	0.05	0.05	0.04	0.07	0.03
Spouse employed	0.51	0.50	0.48	0.50	0.59
Housing					
Homeowner without mortgage (= 1)	0.18	0.08	0.23	0.22	0.11
Homeowner with mortgage (= 1)	0.44	0.43	0.43	0.39	0.54
Household Finances					
Household income (£)	39915	34828	44704	34484	45217
Liquid savings (£)	8852	0	22440	0	8072
Consumer credit debt (£)	2641	7279	0	0	6574
Co-Holding (£)	471	0	0	0	2491
Income and Expenditure Risk					
Expects to be unemployed (= 1)	0.10	0.09	0.10	0.09	0.10
Likely to borrow more in future (= 1)	0.11	0.22	0.05	0.09	0.13
Behavioural Characteristics					
Literacy score (0-3)	1.93	1.74	2.19	1.73	2.00
Impulsive spender (= 1)	0.15	0.26	0.08	0.11	0.23
Read financial press (= 1)	0.32	0.19	0.40	0.27	0.37
Observations	2196	422	717	642	415

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
Age			
18-24	0.05	0.04	0.01
25-34	0.27	0.26	0.24
35-44	0.25	0.27	0.30
45-54	0.24	0.25	0.26
55+	0.19	0.18	0.18
Demographics			
Male (= 1)	0.49	0.52	0.55
Married / living as married (= 1)	0.73	0.77	0.79
Dependent children (= 1)	0.25	0.26	0.34
Education			
Education leaving age	19.36	19.39	19.54
Financial education in school (1-4)	1.50	1.51	1.59
Employment			
Employed (= 1)	0.84	0.86	0.87
Unemployed (= 1)	0.03	0.03	0.04
Spouse employed	0.60	0.64	0.64
Housing			
Homeowner without mortgage (= 1)	0.11	0.13	0.13
Homeowner with mortgage (= 1)	0.56	0.62	0.64
Household Finances			
Household income (£)	45700	48756	52772
Liquid savings (£)	8411	10011	11972
Consumer credit debt (£)	6575	7030	8677
Income and Expenditure Risk			
Expects to be unemployed (= 1)	0.10	0.11	0.11
Likely to borrow more in future (= 1)	0.12	0.10	0.10
Behavioural Characteristics			
Literacy score (0-3)	2.03	2.08	2.11
Impulsive spender (= 1)	0.23	0.25	0.27
Read financial press (= 1)	0.38	0.40	0.40
Observations	393	284	182

Table 3: Consumer Credit Portfolios for Co-Holders

	Co-Holding > £100	Co-Holding > £500	Co-Holding > £1500
Consumer credit debt (£)	6575	7030	8677
Credit Card (£)	2369	2653	2993
Store Card (£)	60	60	73
Personal Loan (£)	2136	1936	2619
Overdraft (£)	495	542	604
Hire-Purchase Agreement (£)	235	295	364
Car Loan (£)	1116	1345	1799
Mail Order Catalogue (£)	26	19	9
Payday Loan (£)	362	.	.
Other Loan (£)	126	175	207
DSS Loan (£)	230	.	.
Observations	393	284	182

Table 4: Probit Model for Characteristics of Co-Holders

	(1) Co-Holder		(2) Co-Holding > £500		(3) Co-Holding > £1500	
	β / SE	Mfx	β / SE	Mfx	β / SE	Mfx
Age						
18-24	−0.234	−0.061	−0.311	−0.060	−0.849***	−0.105***
	(0.154)		(0.191)		(0.311)	
25-34	0.016	0.004	0.002	0.000	−0.097	−0.012
	(0.101)		(0.111)		(0.128)	
35-44	−0.044	−0.012	−0.048	−0.009	−0.085	−0.010
	(0.096)		(0.104)		(0.117)	
55+	−0.006	−0.001	−0.044	−0.008	0.025	0.003
	(0.105)		(0.116)		(0.134)	
Demographics						
Male (= 1)	−0.016	−0.004	0.035	0.007	0.052	0.006
	(0.068)		(0.076)		(0.088)	
Married / living as married (= 1)	0.019	0.005	0.033	0.006	−0.034	−0.004
	(0.133)		(0.155)		(0.179)	
Dependent children (= 1)	−0.111	−0.029	−0.105	−0.020	0.166	0.020
	(0.084)		(0.092)		(0.102)	
Education						
Education leaving age	0.083	0.022	0.121	0.023	−0.055	−0.007
	(0.249)		(0.284)		(0.335)	
Education leaving age^2	−0.003	−0.001	−0.003	−0.001	0.001	0.000
	(0.006)		(0.007)		(0.009)	
Employment						
Employed (= 1)	0.268***	0.070***	0.254**	0.049**	0.303**	0.037**
	(0.093)		(0.109)		(0.136)	
Unemployed (= 1)	−0.016	−0.004	−0.013	−0.002	0.218	0.027
	(0.176)		(0.209)		(0.240)	
Housing						
Homeowner without mortgage (= 1)	−0.369***	−0.096***	−0.070	−0.013	0.006	0.001
	(0.116)		(0.129)		(0.150)	
Homeowner with mortgage (= 1)	0.064	0.017	0.254***	0.049***	0.200*	0.025*
	(0.082)		(0.093)		(0.109)	
Household Finances						
Household income (£10,000s)	−0.081	−0.021	−0.017	−0.003	0.043	0.005
	(0.078)		(0.090)		(0.108)	
Household income^2	0.015	0.004	0.010	0.002	0.010	0.001
	(0.010)		(0.012)		(0.014)	
Household income^3	−0.001	−0.000	−0.000	−0.000	−0.001	−0.000
	(0.000)		(0.000)		(0.000)	
Behavioural Characteristics						
Literacy score (0-3)	0.042	0.011	0.073*	0.014*	0.060	0.007
	(0.035)		(0.040)		(0.046)	
Impulsive spender (= 1)	0.391***	0.102***	0.458***	0.088***	0.518***	0.064***
	(0.083)		(0.091)		(0.102)	
Read financial press (= 1)	0.155**	0.041**	0.147*	0.028*	0.069	0.009
	(0.071)		(0.077)		(0.089)	
Observations	2196		2196		2196	
Pseudo R^2	0.043		0.069		0.095	
LR chi2	91.854		116.344		119.715	
Prob > chi2	0.000		0.000		0.000	
Baseline predicted probability	0.189		0.129		0.083	

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

Note: Omitted groups: *Employment:* Student/Housewife/Disabled. *Housing:* Private renter/Social renter. Further controls for spouse employment status.

Table 5: Probit Model for Characteristics of Co-Holders with Income Risk

	(1) Co-Holder		(2) Co-Holding > £500		(3) Co-Holding > £1500	
	β / SE	Mfx	β / SE	Mfx	β / SE	Mfx
Age						
18-24	−0.235	−0.061	−0.315*	−0.060*	−0.852***	−0.105***
	(0.155)		(0.191)		(0.312)	
25-34	0.010	0.003	0.004	0.001	−0.096	−0.012
	(0.101)		(0.111)		(0.128)	
35-44	−0.045	−0.012	−0.048	−0.009	−0.085	−0.011
	(0.096)		(0.104)		(0.117)	
55+	0.001	0.000	−0.046	−0.009	0.026	0.003
	(0.105)		(0.116)		(0.134)	
Demographics						
Male (= 1)	−0.016	−0.004	0.037	0.007	0.055	0.007
	(0.068)		(0.076)		(0.088)	
Married / living as married (= 1)	0.018	0.005	0.027	0.005	−0.043	−0.005
	(0.134)		(0.156)		(0.180)	
Dependent children (= 1)	−0.120	−0.031	−0.099	−0.019	0.173*	0.021*
	(0.084)		(0.092)		(0.102)	
Education						
Education leaving age	0.072	0.019	0.127	0.024	−0.049	−0.006
	(0.249)		(0.284)		(0.335)	
Education leaving age^2	−0.002	−0.001	−0.004	−0.001	0.001	0.000
	(0.006)		(0.007)		(0.009)	
Employment						
Employed (= 1)	0.284***	0.074***	0.252**	0.048**	0.303**	0.037**
	(0.094)		(0.110)		(0.137)	
Unemployed (= 1)	−0.024	−0.006	−0.009	−0.002	0.218	0.027
	(0.176)		(0.209)		(0.241)	
Housing						
Homeowner without mortgage (= 1)	−0.368***	−0.096***	−0.073	−0.014	0.003	0.000
	(0.116)		(0.129)		(0.150)	
Homeowner with mortgage (= 1)	0.067	0.018	0.252***	0.048***	0.197*	0.024*
	(0.082)		(0.093)		(0.109)	
Household Finances						
Household income (£10,000s)	−0.074	−0.019	−0.021	−0.004	0.038	0.005
	(0.078)		(0.091)		(0.108)	
Household income^2	0.014	0.004	0.011	0.002	0.011	0.001
	(0.010)		(0.012)		(0.014)	
Household income^3	−0.001	−0.000	−0.000	−0.000	−0.001	−0.000
	(0.000)		(0.000)		(0.000)	
Behavioural Characteristics						
Literacy score (0-3)	0.040	0.010	0.073*	0.014*	0.060	0.007
	(0.035)		(0.040)		(0.046)	
Impulsive spender (= 1)	0.374***	0.097***	0.473***	0.091***	0.535***	0.066***
	(0.085)		(0.094)		(0.105)	
Read financial press (= 1)	0.156**	0.041**	0.145*	0.028*	0.066	0.008
	(0.071)		(0.077)		(0.089)	
Income and Expenditure Risk						
Expects to be unemployed (= 1)	−0.115	−0.030	0.012	0.002	−0.011	−0.001
	(0.109)		(0.118)		(0.135)	
Likely to borrow more in future (= 1)	0.141	0.037	−0.093	−0.018	−0.099	−0.012
	(0.101)		(0.122)		(0.140)	
Observations	2196		2196		2196	
Pseudo R^2	0.045		0.069		0.096	
LR chi2	94.809		116.944		120.238	
Prob > chi2	0.000		0.000		0.000	
Baseline predicted probability	0.189		0.129		0.083	

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

Note: Omitted groups: *Employment:* Student/Housewife/Disabled. *Housing:* Private renter/Social renter. Further controls for spouse employment status.

Table 6: Tobit: Amount of Co-Holding

	(1) Tobit β / SE	(2) Tobit β / SE
Age		
18-24	−1360.228*	−1371.941*
	(806.915)	(807.953)
25-34	−219.216	−240.271
	(514.894)	(515.348)
35-44	−310.715	−311.438
	(485.780)	(486.013)
55+	−5.135	22.656
	(533.267)	(533.875)
Demographics		
Male (= 1)	41.931	51.715
	(346.998)	(347.576)
Married / living as married (= 1)	211.666	191.303
	(684.406)	(685.961)
Dependent children (= 1)	−162.260	−184.935
	(425.755)	(427.302)
Education		
Education leaving age	285.606	248.121
	(1277.620)	(1278.202)
Education leaving age^2	−8.556	−7.647
	(33.161)	(33.175)
Employment		
Employed (= 1)	1395.856***	1474.822***
	(487.327)	(492.888)
Unemployed (= 1)	246.779	224.256
	(908.263)	(908.886)
Housing		
Homeowner without mortgage (= 1)	−1537.905***	−1542.419***
	(596.501)	(597.636)
Homeowner with mortgage (= 1)	401.985	408.946
	(421.464)	(422.108)
Household Finances		
Household income (£10,000s)	−560.208	−536.607
	(399.933)	(400.892)
Household income^2	128.818**	126.848**
	(52.173)	(52.217)
Household income^3	−5.004***	−4.960***
	(1.848)	(1.848)
Behavioural Characteristics		
Literacy score (0-3)	177.758	163.759
	(181.422)	(181.959)
Impulsive spender (= 1)	2034.985***	1994.641***
	(423.282)	(431.735)
Read financial press (= 1)	1024.583***	1022.254***
	(359.190)	(359.548)
Income and Expenditure Risk		
Expects to be unemployed (= 1)		−589.849
		(559.882)
Likely to borrow more in future (= 1)		423.666
		(520.350)
Observations	2196	2196
Pseudo R^2 / R^2	0.013	0.013
LR chi2 / F	120.232	121.958
Prob > chi2 / Prob > F	0.000	0.000
Baseline Co-Holding (£)	470.738	470.738

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

Dependent Variable: Amount of Co-Holding with lower limit of £0

Note: Omitted groups: *Employment:* Student/Housewife/Disabled. *Housing:* Private renter/Social renter. Further controls for spouse employment status.