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Why are some households so poorly insured? ☆

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ABSTRACT

We explore empirically how households insure themselves against consumption volatility. We asked households how they would fund an unexpected emergency consumption expense equivalent to one month's income. Answers reveal a range of consumption insurance mechanisms, including borrowing from credit markets and social networks. Despite this, more than one fifth of households have no plan to insure their consumption. The likelihood of non-insurance increases with poor financial literacy and is highest among households most at risk of experiencing a financial shock. Among these households we see large effects of poor financial literacy on non-insurance.

1. Introduction

Due to the existence of incomplete markets households are unable to perfectly insure their consumption (Bewley, 1977). A large theoretical literature explores the implications of incomplete markets for household behaviour and welfare, including how households can find consumption insurance through saving (Aiyagari, 1994; Carroll, 1997), family labour supply (Blundell et al., 2008,2016; Attanasio et al., 2005), social security provision (Conesa and Krueger, 1999; Storesletten et al., 1999; Golosov et al., 2016) and transfers from within social networks (Ambrus et al., 2014).

Do households have insurance against shocks in practice? Many studies address this question by documenting the wide distribution of financial assets and saving across the population that might be held as self-insurance (Krusell and Smith, Jr., 1998; Carroll and Samwick, 1998; Huggett, 1996; Hurst et al., 2010). However, theory emphasises the variety of mechanisms through which households can manage shocks apart from a buffer of assets. Some mechanisms, such as borrowing from credit markets or transfer from social networks, might fall under the radar of empirical analysis based on household balance sheets.

In this paper we shed new light on how households insure themselves against shocks. We use survey data from a representative sample of households which includes information on the degree of the household's consumption insurance by asking households how they would cover an emergency expense equal to one month's income. We uncover broad heterogeneity in insurance plans. While approximately half of consumers state they would use existing deposits or savings, one

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quarter would borrow either from the credit market or from within their social network. One fifth of households have no plan to fund their consumption.

We make three new contributions to understanding this heterogeneity in how households find insurance. First, we show that life-cycle characteristics are strong determinants of the insurance mechanism households plan to draw upon in emergencies. Older, retired households who are asset rich tend to insure through savings and deposits. Younger households with lower net worth and higher credit holdings tend to insure through borrowing, using either additional formal credit or borrowing from their social network. While this pattern is perhaps unsurprising, it casts doubt on validity of the commonly used approach of measuring 'financial fragility' using calculations based on indebtedness often used in the literature (Caner and Wolff, 2004; Adams and West, 2015; Brunetti et al., 2012; Brown and Taylor, 2008).

Second, our main contribution is to explore the behavioural determinants of the type of insurance used by households. We use a range of survey instruments to measure financial literacy, attitudes to risk, patience and present bias. To implement these we use established methods for measuring behavioural traits in household surveys (Vischer et al., 2013; Dohmen et al., 2010; Lusardi and Mitchell, 2014a). In regression estimates a one-unit reduction in financial literacy on our four-point index raises the likelihood of the household not having a plan to fund an emergency expense by 15%. This effect is large, equivalent to a two standard deviation decrease in risk aversion.

Our third contribution is to examine heterogeneity in insurance across households by their exposure to risk. We show that poor financial literacy is a stronger predictor of having no plan among this group of particularly high-risk households, showing that private consumption insurance is inefficiently distributed across households. One additional reason why households may be unprepared for an emergency expense is that they have recently incurred an emergency, depleting their source of insurance (e.g. run down their buffer of savings or exhausted transfers from within their social network).[1] We find our main results hold when controlling for such shocks.

Our findings also relate to the growing recent literature on household financial stability, which has sought to go beyond wealth-based measures of internal insurance. Brunetti et al., (2016) propose an alternative measure of financial fragility based on available income and wealth portfolio characteristics. Jappelli et al., (2013) propose an aggregate measure of financial fragility based on the sensitivity of bankruptcies to aggregate shocks. Our approach is closest to that of Lusardi et al., (2011) who use a similar survey question to the one used in this paper to evaluate the 'financial fragility' of US households. They find that approximately one quarter of US households have no plan to meet an emergency expense.

To our knowledge, ours is the first study to examine the relationship between financial literacy (plus other behavioural characteristics) and household consumption insurance. In particular, our findings cast new light on another source of detriment to consumers arising from poor financial literacy, adding to prior studies (Disney and Gathergood, 2013; Lusardi and Mitchell, 2007a; Gerardi et al., 2013; Gathergood and Weber, 2017; Lusardi and Mitchell, 2007b; van Rooij et al., 2011; Gaudecker, 2015). More broadly, this paper relates to the growing household finance literature (Campbell, 2006; Campbell et al., 2011; Tufano et al., 2006).

The approach we adopt of using self-reported responses to a survey question has several advantages. Firstly, households may have important private information about the mechanisms they can use to manage shocks. Secondly, we are able to identify a set of households who explicitly state that they have no plan, or do not know what plan they would. Thirdly, our survey setting allows us to add a rich set of variables which measure financial literacy and behavioural characteristics to our dataset.

Our paper proceeds as follows. In Section 2 we introduce our survey design and measures of consumption insurance, financial literacy and behavioural characteristics. In Section 3 we present our main results including econometric analysis. Section 4 concludes the paper.

2. Survey design and data

2.1. Data

We commissioned the addition of our supplementary questions to a regular survey of UK households undertaken quarterly by the London-based market research firm YouGov. One of the authors of this paper has used YouGov survey data in earlier studies on financial literacy and household behaviour (including consumer credit choices in Disney and Gathergood, 2013; and mortgage choices in Gathergood and Weber, 2017). YouGov has access to a panel of 350,000 households and draws a sample of approximately 2,000 households for each quarterly wave of the Debt Tracker survey.[2] We use the August 2013 wave. The survey is administered online and achieves a representative sample by making special provision for respondents who do not have access to the internet.

[1] In standard buffer-stock models of saving behaviour, households take time to rebuild their buffers of assets after incurring a financial shock (Carroll, 1997).

[2] The YouGov Debt Tracker surveys a representative sample of the UK population, i.e. England, Northern Ireland, Scotland and Wales. Subjects are recruited from the YouGov panel, with the target sample stratified to represent the UK population by age, gender, homeownership and employment status. The survey achieves an 80% response rate. Respondents are paid £10 for participation in the survey, which takes approximately 45 minutes to complete. Further details on the survey are provided at https://yougov.co.uk/find-solutions/reports/trackers/debt.

2.2. Consumption insurance survey question

We designed the following survey question to measure the consumption insurance of respondent households: "*Please imagine you had to pay for an unexpected major purchase equivalent to your monthly household income. How would you find the money to meet such an expense?*

Draw money from current account (excluding any overdraft facility);
Use existing savings/investments;
Borrow the money (including use of an overdraft);
Get help from family/friends;
*Some other way (*e.g. *sell something, earn extra money, cut spending);*
Would not be able to find the money;
Don't know".

The question is designed to measure the household's ability to come up with sufficient funds to cover a one-time emergency expense. The advantage of using this approach to measuring consumption insurance based upon self-report is that it does not depend upon the researcher constructing an objective measure of the extent to which a household is insured against shocks (such as a ratio of debt to income). These types of measures might neglect private information about ability to find emergency monies, such as transfers or borrowing available from within social networks such as family, colleagues and friends.

This question we use above is similar to that used by Lusardi et al., (2011) but has two modifications.[3] First, we specify the amount of funds required in an emergency as 'equivalent to your monthly income' whereas Lusardi et al., (2011) state a specific value ($2,000). The motivation for our approach comes from the recent literature emphasises that households tend to develop consumption commitments in line with their long-run income (i.e. permanent income), such as the recent models of Chetty and Szeidl (2007,2016). Hence phrasing the question in terms of monthly income avoids a mechanical relationship between the ability to service a fixed monetary value of emergency expense and income simply because the monetary value understates the level of emergency expenditure likely to be faced by a higher income household.

Second, we do not stipulate a time period within which the emergency funds need to be sourced, whereas Lusardi et al., (2011) state 'within the next month' . We omit this extra clause because in our UK context the frequency of salary payments differs across workers by occupation and the stipulation of 'one month' might fall just outside, or just within, the time horizon to next salary payment.

2.3. Measures of financial literacy and behavioural characteristics

We also include in the survey a set of questions that measure individual financial literacy and behavioural characteristics. For an extensive review of the range of financial literacy measures used in the prior literature see Lusardi and Mitchell (2014b). We include three questions which measure distinct concepts i) loan maturity (whether total interest payments are higher on a 15-year loan or a 30-year loan where each loan has the same principal and interest rate), ii) a simple interest calculation (6% of £50,000), and iii) a compound interest calculation (whether a debt of £100,000 at a 5% interest rate grows to less, equal to, or more than £125,000 after five years), and finally.[4]

We base our measures of behavioural characteristics on survey questions developed in the recent literature on elicitation of behavioural characteristics in survey settings (Vischer et al., 2013; Ameriks et al., 2007; Dohmen et al., 2010, 2011). First our measure of risk attitude is based on a question developed by Dohmen et al., (2010): "How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please tick a box on the scale, where the value 0 means: 'unwilling to take risks' and the value 10 means: 'fully prepared to take risk'." Second, we elicit patience, using a widely used short-format question to proxy for patience as described in Dohmen et al. (2010). The question is: "How do you see yourself: are you generally an impatient person, or someone who always shows great patience? Answers are coded on an 11-point scale, with 0 referring to 'very impatient' and 10 to 'very patient'."

Third, we elicit present bias. Does patience differ from present bias? In Laibson (1997) the rate of long-run time preference is independent of the near-term discount rate. Recent studies have shown that the distinction between present bias and patience is important in explaining a variety of financial decisions (Gathergood, 2012; Gathergood and Weber, 2014; Meier and Sprenger, 2013, 2010). We elicit present bias using Likert scale responses, by which respondents associate themselves in varying degrees with a short statement: "I am impulsive and tend to buy things even when I can't really afford

[3] The exact question used in Lusardi et al. (2011) is: '"If you were to face a $2,000 unexpected expense in the next month, how would you get the funds you need?"'.

[4] The specific questions we used are as follows: 1) Suppose a 15-year mortgage and a 30-year mortgage have the same Annual Percentage Rate and the same amount borrowed. The total amount repaid will be: i) Higher for the 15-year mortgage; ii) Higher for the 30-year mortgage; iii) The total amount repaid on both mortgages will be the same; iv) Don't know. 2) Suppose you owe £50,000 on a mortgage at an Annual Percentage Rate of 6%. If you didn't make any payments on this mortgage how much would you owe in total after one year? i) Less than £50,000; ii) £50,000 - £54,999; iii) £55,000 - £59,999; iv) £60,000 - £64,999; v) More than £65,000; vi) Don't know. 3) Suppose you owe £100,000 on a mortgage at an Annual Percentage Rate of 5%. If you didn't make any payments on this mortgage how much would you owe in total after five years? i) Less than £120,000; ii) Between £120,000 and £125,000; iii) More than £125,000; iv) Don't know.

Table 1
Summary Statistics.

	mean	sd	min	max
Age				
Age 18–24 (=1)	0.05	0.22	0	1
Age 25–34(=1)	0.17	0.38	0	1
Age 35–44(=1)	0.18	0.39	0	1
Age 45–54(=1)	0.19	0.39	0	1
Age 55+(=1)	0.40	0.49	0	1
Demographics				
Male(=1)	0.50	0.50	0	1
Married / Partner(=1)	0.64	0.48	0	1
Divorced / Separated(=1)	0.09	0.28	0	1
Dependent Children(=1)	0.24	0.43	0	1
Education				
Age Left Education	18.31	2.67	14	22
Employment				
Employed (=1)	0.61	0.49	0	1
Unemployed(=1)	0.03	0.16	0	1
Retired(=1)	0.26	0.44	0	1
Partner Employed(=1)	0.39	0.49	0	1
Home Ownership				
Home Owner(=1)	0.67	0.47	0	1
Renter(=1)	0.25	0.43	0	1
Finances				
Household Income (£)	34,303.04	16,261.16	0	86,360
Mortgage Debt, >0 (£)	78,983.56	55,192.64	36	180,000
Unsecured Debt, >0 (£)	8421.29	8702.40	10	29,800
Total Savings (£)	9945.24	24,277.16	0	120,000
Financial Literacy				
Financial Literacy (0–3)	1.66	1.08	0	3
Loan Maturity Correct(=1)	0.70	0.46	0	1
Simple Interest Correct(=1)	0.55	0.50	0	1
Compound Interest Correct(=1)	0.41	0.49	0	1
Behavioural Characterstics				
Patience (0–10)	5.84	2.47	0	10
Risk Attitude (0–10)	4.25	2.41	0	10
Present Biased (=1)	0.12	0.32	0	1
Observations	2036			

Notes: Table reports summary statistics for the survey sample. Age reported in categories. Age left education is age at which the respondent left full-time education. Annual household income is net income of main respondent and his / her spouse. Mortgage debt is value of all mortgages secured against property. Unsecured debt is sum of all consumer credit debt outstanding (excluding credit card balances that are repaid at the end of the cycle). Savings is a measure of liquid savings (see main text for details). Financial literacy is measured using responses to multiple-choice questions, see main text for details. Behavioural characteristics are measured using survey instruments described in the main text.

them." From answers to this question create a binary variable that we label 'Present biased', taking the value of one if the respondent answers 'tend to agree' or 'agree strongly' and zero.

2.4. Summary data

Summary data for our sample of 2,036 respondents is shown in Table 1. These summary statistics from the YouGov data closely match those for from much larger official survey samples representative of the UK population, such as the Wealth and Assets survey.[5] In our sample, half of the respondents are male, with close to two-thirds married, or living with a partner, and one in ten divorced. Among the 40% of the sample with unsecured debts, average debt is approximately £8,400 pounds and among the 45% with non-zero savings, average savings is close to £10,000.

On average respondents answered 1.66 of the financial literacy questions correctly, with the proportion of respondents answering correcting noticeably lower for the later, more complex, questions requiring an interest calculation and understanding of compound interest. Less than half of the sample answered the compound interest question correctly. Most respondents tend slightly towards reporting patience, with a mean score of 5.84 on the 0–10 scale. Respondents on average tend towards risk aversion (with the average willingness to take risks on the 10-point scale of 4.25). In the sample 12% of respondents report that they 'agree' or 'strongly agree' that they are impulsive in their spending decisions.

[5] For a more detailed comparison of the YouGov DebtTrack survey and Wealth and Assets Survey see Gathergood and Weber (2017).

Table 2
Responses to Consumption Insurance Survey Question.

(a) Summary of Responses

Please imagine you had to pay for an unexpected major purchase equivalent to your monthly household income. How would you find the money to meet such an expense?	Frequency	Percent
Draw money from current account (excluding any overdraft facility)	163	8.01%
Use existing savings/investments	888	43.61%
Borrow the money (including use of an overdraft)	230	11.30%
Get help from family/friends	198	9.72%
Some other way (e.g. sell something, earn extra money, cut spending)	146	7.17%
Would not be able to find the money	221	10.85%
Do not know	190	9.33%
Total	2036	100%

(b) Summary Socio-Economic Characteristics by Response

	Deposits / Savings	Borrow	Other	Unable / DK
Financial Literacy				
Financial Literacy (0–3)	1.88	1.66	1.42	1.19
Loan Maturity Correct (=1)	0.77	0.71	0.62	0.52
Simple Interest Correct (=1)	0.62	0.54	0.49	0.39
Compound Interest Correct (=1)	0.48	0.41	0.32	0.27
Behavioural Characterstics				
Patience (0–10)	5.94	5.78	6.20	5.51
Risk Attitude (0–10)	4.12	4.63	4.51	4.10
Present Biased (=1)	0.05	0.23	0.14	0.16
Observations	1051	428	146	411

Notes: Table shows breakdown of responses to consumptin insurance survey question. Respondents were asked to state the main way in which they would find the money (one category only). The order in which the options were presented was randomised across survey participants.

3. Results

3.1. Consumption insurance in the survey sample

We begin our results by showing a summary of responses to the consumption insurance question in Table 2. We can summarise responses by constructing four main categories: i) those who would use deposits / savings (the first two answer options); ii) those who would borrow either formally or informally (the third and fourth answer options), iii) those with some other plan not listed in the available options and, iv) those who would not be able to find the money or do not know how they would find the money.

Approximately half of respondents reported that they would be able to find funds to meet the emergency expense from their existing deposit or savings, with 8% reporting they would use funds in their deposit account and a further 44% reporting they would use savings or investments. Approximately 21% answered that they would borrow in some form - with 11% intending to use a formal borrowing product and 10% stating that they would receive help from their social network of family of friends (which does not necessarily imply borrowing). A further 7% state they would find the money some other way. One fifth of respondents can offer no specific plan - citing that they would not be able to find the money (11%) or do not know where they would find the money (9%). This proportion is similar to that in Lusardi et al., (2011), who find that approximately one quarter of households sate they could not come up with $2,000 within 30 days.

What explains this variation in responses? We see a clear pattern that reliance on assets versus borrowing as a source of funds to meet the emergency expense correlates with life-cycle characteristics (for full results see Table A1). Respondents in the deposits / savings category are typically older (53% are aged over 55, compared with 16% in the borrow group), more likely retired (37% compared with 7%), own their own homes (80% compared with 54%), hold higher levels of savings (£18,200 compared with £1,400) and have higher incomes (£38,700 compared with £33,000). One implication of these patterns is that measures of available consumption insurance based on observed balance sheet positions, such as low financial assets, high levels of debt, or high levels of debt relative to income, might be unreliable reflections of a household's actual ability to cope with financial shocks. Young, higher debt households will have more access to credit due to their rising future income, allowing them to smooth through shocks.

Households in the unable / do not know group exhibit no clear differences life-cycle group characteristics compared with the other groups. Their age profile broadly matches that of the population (seen in Table 1), as does their balance of males (52% compared with 50% in the whole sample), marital status (58% married, compared with 64%) employment (58% compared with 61%) and proportion retired (22% compared with 26%). However, these households are poorer than the sample average in their household annual income (£26,200 compared with £34,300) and hold markedly lower savings (£540 compared with £10,000).

Table 2 shows that the groups also differ in their average behavioural characteristics. Respondents with unable / do not know group have notably lower financial literacy, on average answering only 1.19 of the questions correctly compared with a score of 1.88 among the deposits / savings group, a difference of more than one standard deviation. Among those in the unable / do not know group fewer than one third answering the compound interest question correctly, compared with close to one half of those in the deposits / savings group. Individuals in the borrow group also show much higher self-reported tendencies towards present bias.

3.2. Multivariate regression estimates

Our main interest is in estimating the effect of behavioural characteristics upon consumption insurance. To do so we use a series of multivariate probit regressions, which take the general form:

$$\Pr(Y = 1) = \beta_0 + \beta_1 FL + \beta_2 B + \beta_3 \mathbf{X}' \quad (1)$$

where Y is a 1/0 indicator variable denoting the response of the individual to the consumption insurance survey question, *FL* is the financial literacy index on a 4-point scale, *B* is a vector of behavioural characteristics (risk attitude (0–10 scale), patience (0–10 scale) and present bias (1/0 indicator variable) as explained earlier and $\mathbf{X}'$ is a vector of socio-economic control variables shown in Table 1. In our main analysis we estimate models in which the dependent variables are, variously, indicators for the main category answers to the consumption insurance question: i) deposits / savings; ii) borrow; iii) other, iv) unable / do not know. We estimate coefficient values and calculate averaged marginal effects. We adopt this approach for ease of interpretation of the marginal effects. An alternative approach would be to estimate a multinomial probit or logit models (as the answer categories have no natural ordering). When we do so the models return very similar results to those from Eq. 1 above.

Estimates of our main empirical specification are shown in Tables 3–6. In Table 3 the dependent variable in each column is a 1/0 indicator variable, taking a value of 1 for deposits / savings and a value of 0 otherwise. Column 1 shows results from a model containing only demographic and socio-economic variables. Coefficient estimates confirm the broad life-cycle pattern of responses: there are positive and statistically significant coefficients on the oldest age group, the individual's education leaving age, whether the individual is retired, and whether the individual is a home owner. In Column 2 the likelihood of savings / deposit answers increases with household income and savings, and decreases with the level of debt, as we would expect.

In Column 3 each of the behavioural characteristics variables are statistically significant (though the coefficient on the financial literacy variable is statistically significant at only the 5% level). The marginal effects imply that a one-unit increase in financial literacy increases the likelihood of the dependent variable taking a value of 1 by 3.8 percentage points. Against a baseline predicted probability from the model of 0.52, this equates to a 7.3% increase. The coefficient on the present bias indicator variable is particularly strong, implying an individual who is present biased is 25.4 percentage points, or 49.0% less likely to be in the deposits / savings category. This effect is equivalent to that of 5-point reduction in patience (two standard deviations) or a 3-point increase in risk aversion (one and a half standard deviations).

Table 4 shows results from models in which the dependent variable is an indicator for whether the individual would borrow in response to the financial shock. For socio-economic and financial characteristics, the pattern in the coefficient estimates is the opposite of that in Table 3: older individuals are less likely to borrow in response to the shock, as are those retired, with more education, higher income, more debt (secured or unsecured) and lower-savings. Notably, the propensity to borrow in response to the shock is *increasing* in financial literacy. The coefficient on the financial literacy variable is positive and statistically significant at the 1% level, implying a one-unit increase raises the likelihood of borrowing by 2.7 percentage points, or 13.0%. This further reinforces scepticism of measures of financial fragility based on observed levels of debt as, to the extent that intending to borrow to meet emergency expenses might also be rational.

Table 5 shows results from models in which the dependent variable denotes the 'other' category. Perhaps unsurprisingly, few coefficients are statistically significant in the regression models as this 'other' category is likely to catch a range of means of consumption insurance which have a variety of relationships to individual characteristics. The coefficients on household income and total savings are both negative, indicating that individuals with higher income and savings are less likely to report 'other'.

Table 6 shows results from models in which the dependent variable denotes the unable / do not know category. Coefficient values show broad life-cycle patterns in responses: with the inclusion of financial controls in Column 2 we see that the propensity to not have a plan for meeting the emergency expense decreases with age (the omitted group is the youngest age category) and also falls with income and savings, as might be expected. The model estimates show that the coefficient on the financial literacy variable is negative and statistically significant at the 1% level. The marginal effect of −0.030 implies a one unit reduction in financial literacy increases the likelihood of the dependent variable by 3 percentage points, or 15.0%. This effect is large in comparison with the implied effects from the other behavioural characteristics, equivalent to a 3-unit reduction in patience (one standard deviation) or a 5-unit increase in risk seeking (more than two standard deviations). The coefficient on the present biased dummy variable is not statistically significant, indicating present bias does not predict the propensity to not plan for accommodating an emergency expense.

Table 3
Regression Results for Consumption Insurance Response: Deposits / Savings.

	(1)		(2)		(3)	
	Beta	*ME*	*Beta*	*ME*	*Beta*	*ME*
Age 25–34 (=1)	−0.009	−0.003	0.865***	0.328***	1.277***	0.489***
	(0.156)		(0.188)		(0.204)	
Age 35–44 (=1)	0.016	0.006	0.544***	0.207***	0.696***	0.267***
	(0.161)		(0.192)		(0.205)	
Age 45–54 (=1)	0.172	0.069	1.292***	0.490***	1.686***	0.645***
	(0.162)		(0.203)		(0.220)	
Age 55 + (=1)	0.478***	0.190***	1.565***	0.594***	1.979***	0.757***
	(0.172)		(0.215)		(0.234)	
Male (=1)	0.070	0.028	−0.606***	−0.230***	−0.750***	−0.287***
	(0.060)		(0.078)		(0.086)	
Married / Partner (=1)	−0.004	−0.002	−0.355***	−0.135***	−0.601***	−0.230***
	(0.094)		(0.113)		(0.123)	
Divorced / Separated (=1)	−0.268*	−0.107*	−0.209	−0.079	−0.176	−0.067
	(0.123)		(0.144)		(0.155)	
Dependent Children (=1)	−0.374***	−0.149***	−0.547***	−0.208***	−0.622***	−0.238***
	(0.080)		(0.095)		(0.103)	
Age Left Education	0.087***	0.035***	−0.135***	−0.051***	−0.219***	−0.084***
	(0.013)		(0.018)		(0.021)	
Employed (=1)	0.034	0.013	−1.572***	−0.597***	−2.066***	−0.791***
	(0.105)		(0.150)		(0.167)	
Unemployed (=1)	−0.432*	−0.172*	−0.843***	−0.320***	−0.829***	−0.317***
	(0.214)		(0.249)		(0.263)	
Retired (=1)	0.434***	0.173***	−0.008	−0.003	−0.140	−0.054
	(0.127)		(0.154)		(0.163)	
Partner Employed (=1)	0.045	0.018	−1.529***	−0.580***	−2.065***	−0.790***
	(0.082)		(0.130)		(0.150)	
Home Owner (=1)	0.535***	0.213***	0.755***	0.287***	0.815***	0.312***
	(0.122)		(0.149)		(0.164)	
Renter (=1)	−0.167	−0.066	1.018***	0.387***	1.517***	0.581***
	(0.123)		(0.157)		(0.178)	
Household Income			1.308***	0.497***	1.854***	0.710***
			(0.069)		(0.090)	
Mortgage Debt			−0.090***	−0.034***	−0.119***	−0.046***
			(0.010)		(0.011)	
Unsecured Debt			−0.242***	−0.092***	−0.267***	−0.102***
			(0.056)		(0.062)	
Total Savings			0.298***	0.113***	0.207***	0.079***
			(0.047)		(0.050)	
Financial Literacy (0–3)					0.098***	0.038***
					(0.038)	
Patience (0–10)					0.119***	0.045***
					(0.017)	
Risk Attitude (0–10)					−0.225***	−0.086***
					(0.020)	
Present Biased (=1)					−0.663***	−0.254***
					(0.131)	
Observations	2036		2036		2036	
Chi2	388.83		1171.69		1398.14	
Prob > chi2	0.0000		0.0000		0.0000	
Baseline probability	0.5163		0.5161		0.5183	

Notes: Table reports coefficient estimates, standard errors (in parenthesis) and marginal effects (in adjoining colum) from Probit model estimates. For definitions of covariates see main text. Averaged marginal effects. Stars denote statistical significance at
* 5%.
** 2%.
*** 1% levels.

3.3. Extension I: controlling for recent financial shocks and borrowing constraints

In additional analysis we also control for recent financial shocks which might have affected households in our sample prior to the point of interview and also control for borrowing constraints. Both may limit the capacity of households to cope

Table 4
Regression Results for Consumption Insurance Response: Borrow.

	(1)		(2)		(3)	
	Beta	*ME*	*Beta*	*ME*	*Beta*	*ME*
Age 25–34 (=1)	0.084	0.022	−0.320	−0.067	−0.488***	−0.098***
	(0.157)		(0.171)		(0.177)	
Age 35–44 (=1)	0.073	0.019	−0.184	−0.038	−0.293	−0.059
	(0.162)		(0.175)		(0.180)	
Age 45–54 (=1)	−0.156	−0.041	−0.650***	−0.136***	−0.838***	−0.168***
	(0.166)		(0.187)		(0.193)	
Age 55 + (=1)	−0.545***	−0.143***	−0.980***	−0.204***	−1.207***	−0.242***
	(0.182)		(0.203)		(0.212)	
Male (=1)	−0.137*	−0.036*	0.182**	0.038**	0.147	0.030
	(0.067)		(0.076)		(0.079)	
Married / Partner (=1)	−0.147	−0.039	−0.046	−0.010	0.049	0.010
	(0.107)		(0.114)		(0.118)	
Divorced / Separated (=1)	0.179	0.047	0.078	0.016	−0.006	−0.001
	(0.131)		(0.138)		(0.142)	
Dependent Children (=1)	0.106	0.028	0.154	0.032	0.178*	0.036*
	(0.082)		(0.087)		(0.089)	
Age Left Education	−0.027	−0.007	0.081***	0.017***	0.112***	0.023***
	(0.014)		(0.018)		(0.019)	
Employed (=1)	0.107	0.028	0.838***	0.175***	1.026***	0.206***
	(0.110)		(0.137)		(0.143)	
Unemployed (=1)	−0.076	−0.020	0.116	0.024	0.173	0.035
	(0.212)		(0.217)		(0.220)	
Retired (=1)	−0.320*	−0.084*	−0.020	−0.004	0.089	0.018
	(0.152)		(0.165)		(0.170)	
Partner Employed (=1)	0.223**	0.059**	0.959***	0.200***	1.196***	0.240***
	(0.095)		(0.126)		(0.134)	
Home Owner (=1)	−0.114	−0.030	−0.164	−0.034	−0.143	−0.029
	(0.132)		(0.144)		(0.147)	
Renter (=1)	0.185	0.049	−0.320*	−0.067*	−0.529***	−0.106***
	(0.128)		(0.144)		(0.149)	
Household Income			−0.582***	−0.121***	−0.809***	−0.162***
			(0.057)		(0.067)	
Mortgage Debt			0.054***	0.011***	0.061***	0.012***
			(0.009)		(0.010)	
Unsecured Debt			0.162***	0.034***	0.119**	0.024**
			(0.049)		(0.050)	
Total Savings			−0.172***	−0.036***	−0.131***	−0.026***
			(0.049)		(0.050)	
Financial Literacy (0–3)					0.134***	0.027***
					(0.037)	
Patience (0–10)					−0.030*	−0.006*
					(0.015)	
Risk Attitude (0–10)					0.117***	0.024***
					(0.018)	
Present Biased (=1)					0.405***	0.081***
					(0.099)	
Observations	2036		2036		2036	
Chi2	208.11		416.39		495.62	
Prob > chi2	0.0000		0.0000		0.0000	
Baseline probability	0.2102		0.2096		0.2088	

Notes: Table reports coefficient estimates, standard errors (in parenthesis) and marginal effects (in adjoining colum) from Probit model estimates. For definitions of covariates see main text. Averaged marginal effects. Stars denote statistical significance at
* 5%.
** 2%.
*** 1% levels.

with financial emergencies.[6] Results in Online Appendix Tables A4 and A5 show that the patterns in coefficient estimates for our main variable of interest are unchanged.

[6] A simple reason for a household having no plan to cope with a financial emergency is that the household has recently experienced a financial emergency. The survey data includes information on a broad range of financial changes experienced by the household in the six months prior to interview. In addition, we construct a measure of binding borrowing constraints based on recent credit refusals. Summary data for these variables is shown in Table A3.

Table 5
Regression Results for Consumption Insurance Response: Other.

	(1) Baseline		(2) + Financial		(3) + Behavioural	
	Beta	*ME*	*Beta*	*ME*	*Beta*	*ME*
Age 25–34 (= 1)	0.114	0.015	−0.038	−0.004	−0.113	−0.011
	(0.225)		(0.234)		(0.238)	
Age 35–44 (= 1)	0.072	0.009	−0.022	−0.002	−0.068	−0.007
	(0.232)		(0.242)		(0.244)	
Age 45–54 (= 1)	0.138	0.018	−0.028	−0.003	−0.098	−0.010
	(0.232)		(0.249)		(0.252)	
Age 55 + (= 1)	0.299	0.039	0.195	0.020	0.105	0.011
	(0.244)		(0.260)		(0.264)	
Male (= 1)	−0.070	−0.009	0.069	0.007	0.076	0.008
	(0.086)		(0.094)		(0.096)	
Married / Partner (= 1)	−0.028	−0.004	0.033	0.003	0.074	0.008
	(0.131)		(0.136)		(0.138)	
Divorced / Separated (= 1)	0.002	0.000	−0.027	−0.003	−0.036	−0.004
	(0.167)		(0.169)		(0.171)	
Dependent Children (= 1)	0.149	0.020	0.145	0.015	0.141	0.014
	(0.109)		(0.112)		(0.113)	
Age Left Education	−0.024	−0.003	0.030	0.003	0.041	0.004
	(0.018)		(0.022)		(0.023)	
Employed (= 1)	−0.076	−0.010	0.171	0.018	0.224	0.023
	(0.137)		(0.162)		(0.166)	
Unemployed (= 1)	−0.339	−0.045	−0.351	−0.036	−0.342	−0.035
	(0.303)		(0.309)		(0.311)	
Retired (= 1)	−0.441**	−0.058**	−0.345	−0.036	−0.323	−0.033
	(0.173)		(0.179)		(0.181)	
Partner Employed (= 1)	−0.078	−0.010	0.194	0.020	0.227	0.023
	(0.117)		(0.150)		(0.156)	
Home Owner (= 1)	−0.172	−0.023	−0.182	−0.019	−0.154	−0.016
	(0.173)		(0.181)		(0.182)	
Renter (= 1)	−0.010	−0.001	−0.222	−0.023	−0.264	−0.027
	(0.169)		(0.184)		(0.187)	
Household Income			−0.225***	−0.023***	−0.280***	−0.028***
			(0.070)		(0.079)	
Mortgage Debt			0.023	0.002	0.027*	0.003*
			(0.012)		(0.013)	
Unsecured Debt			0.019	0.002	0.012	0.001
			(0.066)		(0.067)	
Total Savings			−0.206***	−0.021***	−0.185**	−0.019**
			(0.075)		(0.075)	
Financial Literacy (0–3)					−0.045	−0.005
					(0.044)	
Patience (0–10)					0.013	0.001
					(0.019)	
Risk Attitude (0–10)					0.049**	0.005**
					(0.021)	
Present Biased (= 1)					−0.003	−0.000
					(0.131)	
Observations	2036		2036		2036	
Chi2	18.88		62.76		71.35	
Prob > chi2	0.2192		0.0000		0.0000	
Baseline probability	0.0717		0.0717		0.0717	

Notes: Table reports coefficient estimates, standard errors (in parenthesis) and marginal effects (in adjoining colum) from Probit model estimates. For definitions of covariates see main text. Averaged marginal effects. Stars denote statistical significance at
* 5%.
** 2%.
*** 1% levels.

3.4. Extension II: consumption insurance across high and low-risk households

One explanation for our results could be that some households have a low likelihood of facing a financial expense and therefore do not have a plan for meeting an emergency expense. We investigate this by categorising households into groups with high and low risk of experiencing an emergency expense, and then estimate our main models for both groups.[7] Results

[7] We estimate a probit model in which the dependent variable is a 1/0 indicator variable for whether the household experienced any of the financial shocks among the financial shock categories described in the previous section (see Online Appendix Table A6). We calculate the predicted likelihood of

Table 6
Regression Results for Consumption Insurance Response: Unable / Do Not Know.

	(1) Baseline		(2) + Financial		(3) + Behavioural	
	Beta	*ME*	*Beta*	*ME*	*Beta*	*ME*
Age 25–34 (= 1)	−0.161	−0.043	−0.570***	−0.081***	−0.641***	−0.089***
	(0.161)		(0.174)		(0.179)	
Age 35–44 (= 1)	−0.159	−0.043	−0.449**	−0.064**	−0.449**	−0.062**
	(0.165)		(0.178)		(0.182)	
Age 45–54 (= 1)	−0.095	−0.025	−0.620***	−0.088***	−0.631***	−0.087***
	(0.167)		(0.186)		(0.192)	
Age 55 + (= 1)	−0.266	−0.071	−0.704***	−0.100***	−0.681***	−0.094***
	(0.180)		(0.199)		(0.206)	
Male (= 1)	0.096	0.026	0.427***	0.061***	0.567***	0.078***
	(0.066)		(0.077)		(0.081)	
Married / Partner (= 1)	0.102	0.027	0.228*	0.033*	0.279**	0.039**
	(0.102)		(0.110)		(0.114)	
Divorced / Separated (= 1)	0.145	0.039	0.062	0.009	0.092	0.013
	(0.130)		(0.137)		(0.141)	
Dependent Children (= 1)	0.266***	0.071***	0.340***	0.048***	0.356***	0.049***
	(0.086)		(0.092)		(0.094)	
Age Left Education	−0.076***	−0.020***	0.037*	0.005*	0.065***	0.009***
	(0.014)		(0.018)		(0.019)	
Employed (= 1)	−0.095	−0.025	0.645***	0.092***	0.733***	0.101***
	(0.109)		(0.136)		(0.141)	
Unemployed (= 1)	0.597***	0.159***	0.778***	0.111***	0.753***	0.104***
	(0.195)		(0.204)		(0.210)	
Retired (= 1)	−0.167	−0.045	0.154	0.022	0.198	0.027
	(0.136)		(0.149)		(0.152)	
Partner Employed (= 1)	−0.200*	−0.054*	0.510***	0.073***	0.552***	0.076***
	(0.090)		(0.121)		(0.127)	
Home Owner (= 1)	−0.514***	−0.137***	−0.492***	−0.070***	−0.484***	−0.067***
	(0.128)		(0.139)		(0.143)	
Renter (= 1)	−0.017	−0.004	−0.572***	−0.082***	−0.636***	−0.088***
	(0.125)		(0.142)		(0.148)	
Household Income			−0.573***	−0.082***	−0.656***	−0.091***
			(0.058)		(0.067)	
Mortgage Debt			0.021	0.003	0.034***	0.005***
			(0.011)		(0.011)	
Unsecured Debt			0.051	0.007	0.081	0.011
			(0.053)		(0.055)	
Total Savings			−0.560***	−0.080***	−0.508***	−0.070***
			(0.100)		(0.103)	
Financial Literacy (0–3)					−0.219***	−0.030***
					(0.036)	
Patience (0–10)					−0.083***	−0.011***
					(0.015)	
Risk Attitude (0–10)					0.043**	0.006**
					(0.017)	
Present Biased (= 1)					0.042	0.006
					(0.106)	
Observations	2036		2036		2036	
Chi2	151.42		396.56		466.74	
Prob > chi2	0.0000		0.0000		0.0000	
Baseline probability	0.2017		0.2009		0.2005	

Notes: Table reports coefficient estimates, standard errors (in parenthesis) and marginal effects (in adjoining colum) from Probit model estimates. For definitions of covariates see main text. Averaged marginal effects. Stars denote statistical significance at

* 5%.
** 2%.
*** 1% levels.

show that among the high-risk group the coefficient on the financial literacy variable is again negative and statistically significant for the unable / do not know group. Among low-risk households results show the coefficient on the financial literacy index is again negative but with a very small marginal effect more than ten times smaller than the estimates for the high-risk group. Hence financial literacy has a stronger effect of non-insurance among higher risk households. See Online Appendix Tables A9–A14 for the detailed estimates.

facing a financial shock among households who did not experience a recent shock. Responses to the consumption insurance question for high / low risk households (median split) are shown in Online Appendix Table A8-A1l.

4. Conclusion

In this paper we conduct an exploratory analysis of the mechanisms used by households to insure themselves against emergency expenses. We find broad heterogeneity in preparedness of households, with one fifth of households holding no plan. Among households with a plan, life-cycle characteristics explain some of the heterogeneity in plan choice. Poor financial literacy is a strong predictor of the household having no plan to meet an emergency expense. This result holds true when conditioning upon recent financial shocks, and the effect is stronger among those households with the highest predicted risk of a future shock.

Our survey results should be interpreted with the caveats that we ask households about a hypothetical scenario, at only one point in time, and that actual responses of households to emergency expenses may differ from responses stated in the survey. We do not, for example, have natural experiments of exogenous financial shocks which would allow us to compare reported vs. actual responses.

Our findings have two important implications. First, they indicate that poor financial literacy contributes to the inability of households to fundamentally smooth their consumption. Second, our result that lack of consumption insurance is greatest among those household at most risk of a financial shock suggests that private insurance mechanisms are inefficiently distributed in the economy.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jebo.2018.08.006.

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