Skating on thin ice: New evidence on financial fragility

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Abstract

This paper analyzes the financial fragility of Dutch households by examining their ability to raise 2,000 euro within a month in case of a financial emergency. Using data from a survey module fielded in 2016 in the CentERpanel, we document that one in seven Dutch households is financially fragile. Moreover, some demographic groups, specifically females, single person households, renters, low-income households, the lower educated and the unemployed are more likely to be financially fragile. While a majority of households would use their savings to cope with a financial emergency, a noticeable fraction of households would resort to other methods, such as relying on family and friends or borrowing using credit cards. Financial literacy, confidence in financially literacy skills and probability numeracy are all associated with financial fragility as well as with the methods people use to cope with an emergency. These results support previous findings on the importance of financial knowledge and numerical ability for financial decision making.

Keywords: financial fragility, financial literacy, probability numeracy, personal finance, financial behavior
JEL codes: D14, D91

I. Introduction

"Skating on thin ice, is the title of an article in the news magazine "De Groene Amsterdammer" describing a worrisome finding in the Netherlands: a growing number of households are living closer to the edge (Hilhorst and Thomas, 2017). For these families, one unexpected bill may push them into acute debt problems.

There is ample evidence that several Dutch households are facing financial difficulties. For example, the National Institute for Family Finance Information (Nibud)[1] reported that, in 2018, 38 percent of Dutch households have difficulties making ends meet and one in five has payment problems (this was at just 10 percent in 2008).[2] Moreover, they find that even higher income households have payment problems. Using 2014 data from the Central Bureau of Statistics, Hoff, Wildeboer Schut, Goderis, and Vrooman (2016) reported that roughly 15 percent of Dutch households are dealing with risky or problematic debts. The credit rating agency Moody's and De Nederlandsche Bank (DNB) have also warned against the high debt levels among households in the Netherlands. Lack of precautionary savings and low savings have also been noted. Nibud reported in 2015 that roughly 20 percent of households in the Netherlands do not currently have any financial reserves and 30 percent have less than 2,000 euro in savings. Similarly, Hoff et al. (2016) reported that one in three households does not have sufficient funds to cope with an unexpected large expense, such as having a car repair or replacing household furniture. Lastly, the savings rates of households have been declining from about 10 percent in 2016 to 8.8 percent in 2018 (OECD, 2018). Although these savings rates are relatively high compared to savings rates in other countries, a large proportion of Dutch household savings are mandatory savings for pension provisions. Many of these savings are in pension funds, so they cannot be withdrawn by pension plan participants and used, for example, to deal with an emergency.

The figures above raise concern about the financial well-being of these households. A key element in gauging household's financial well-being is their ability to deal with unexpected financial emergencies.[3] Lusardi et al. (2011) proposed a measure, which coined the word "financial fragility" to assess the vulnerability of households to an unexpected financial shock This measure was first included in the 2009 US TNS Global Economics Crisis Study. It was later added to the US National Financial Capability Study (NFCS) (Hasler, Lusardi and Oggero,

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[1] Nibud is a foundation in the Netherlands that conducts research into the personal finances of households.
[2] In the study, respondents had to indicate the extent to which they are able to make ends meet every month on a scale from 'very difficult' to 'very easy.'
3 See, for example, the definition of financial well-being by the U.S. Consumer Financial Protection Bureau (CFPB).

2018). Similar measures have also been used in other research to gauge household financial fragility for example Anderloni,B acchiocchi and Vandone (2012) examined the financial fragility of Italian households by asking respondents "Are you able to cope with an unexpected expense of 700 euros today?". Gathergood and Wylie (2018) also use a similar measure to examine how UK households insure themselves against consumption volatility . Specificlcally, they ask respondents how they would cover an emergency expense equal to one month's income. aIn their earlier work, Lusardi et al. (2011) examined the ability of American households, in the wake of the financial crisis, to cope with an unexpected shock and compared the evidence in the US with that of households in seven other countries, including the Netherlands. In their study, the Netherlands was one of the countries with the lowest fraction of financially fragile households. Still, more than a quarter of Dutch households was classified as being financially fragile in 2009.

In the present paper and building upon the pioneering work of Lusardi et al. (2011), we examine financial fragility among Dutch households' several years after the financial crisis. Specifically, we designed a module on financial fragility, which was fielded in the CentERpanel in 2016. We use not only the original measure of financial fragility by Lusardi et al. (2011), but we also include a question on the coping methods households intend to use when facing a financial emergency.

Moreover, several studies document evidence linking financial literacy to sound financial decision-making and financial well-being (see Stolper and Walter, 2017, and Lusardi, 2012, for an overview). Specifically, Babiarz and Robb (2014), Hasler et al. (2018) find that households who are more financially knowledgeable or more confident in their financial ability are also more likely to have emergency savings and are less likely to be financially fragile. Other studies relate numeracy to financial decision making and show that more numerate individuals are better able to process information and make optimal financial decisions (Banks, O'Dea and Oldfield, 2010). Given this evidence, in our module, we include indicators for both financial literacy and financial literacy confidence to study their relationship to financial fragility and the choice of coping methods. Moreover, given that we aim to study how households deal with unexpected shocks, we also add measures of probability numeracy. Thus, compared to Lusardi et al. (2011), we have new data that allow us to take a deeper dive into the factors influencing financial fragility and the choice of coping methods of Dutch households.

The main findings of our empirical investigation can be summarized as follows: First, 14 percent of Dutch households report that they are probably or certainly unable to come up with 2,000 euro within a month in case of a financial emergency. Second, relatively higher

levels of financial vulnerability are observed among females, single person households, renters, low-income households, the lower educated and the unemployed. Third, turning to methods of coping, we find that a majority of Dutch households would rely on their cash, checking, or savings accounts in case of a financial emergency. However, some households would also rely on less formal methods, such as rely on their network of family and friends. Others, resort to borrowing via credit cards. Fourth, we find that the ability to cope as well as the choice of coping methods is related to financial knowledge and probability numeracy.

Several of our findings are novel and they can be important, for example, to inform policy and programs toward strengthening the financial security of households. While a lot of attention is normally devoted to retirement savings, it may be useful to also pay attention to short-term savings and improve the financial resilience of Dutch families and their ability to face unexpected shocks.

The paper is organized as follows: in the next section, we describe our data sources. In section III, we present the findings on financial fragility among Dutch households. In section IV, we examine the ways Dutch households foresee coping with financial shocks and the underlying characteristics influencing the choice of coping methods. In section V, we summarize our main findings and discuss their implications for future research and for policymakers and financial institutions.

II. Data

In July 2016, CentERpanel fielded the new module we designed to measure financial fragility and the coping methods of Dutch households. CentERpanel is an internet panel managed by CentERdata, a research institute at Tilburg University specializing in internet surveys. The panel is designed to be representative of the Dutch population. Participation in the panel is not dependent on the use of and access to the internet. If necessary, equipment is provided to households without a computer or internet connection (e.g., a set-top box that enables members to participate through their television). Overrepresentation and underrepresentation of certain groups in the population are corrected for during the recruitment phase and by the use of sample weights. Panel attrition is dealt with by drawing refreshment samples biannually. In total, 2,550 of 2,893 survey respondents aged 16 and older completed our financial fragility module, a response rate of 88.1 percent.

We have merged the data from the financial fragility module with data from another module containing financial literacy questions that was fielded in September 2015 to

CentERpanel respondents aged 18 years and older. Following Verbeek and Nijman (1992), we test for attrition bias by running multinomial logit regressions using financial fragility as the dependent variable and different socioeconomic and demographic characteristics as independent variables. We add a dichotomous variable to these regressions, indicating whether the observations are matched across both data sets. If this variable is significant after accounting for background variables, then attrition is a problem. However, the results show that there is no evidence of attrition bias.[4] Our study is based on the sample with matched observations, including respondents with information from the financial fragility questions and the financial literacy questions, and contains 1,716 respondents. In the empirical analyses, we cluster the standard errors at the household level because multiple members within a household were allowed to complete the questionnaire.

To measure the financial fragility of Dutch households, we use the indicator by Lusardi et al. (2011). To be specific, respondents were asked: "How confident are you that you could come up with €2,000 if an unexpected need arose within the next month?" Respondents could state, "I am certain I can come up with €2,000" "I could probably come up with €2,000", "I could probably not come up with €2,000", or "I am certain I cannot come up with €2,000". Respondents could also reply "I do not know" and we have excluded these respondents from the analyses (2.3% of the sample before merging with other modules). Following Lusardi et al. (2011), respondents stating that they probably could not or certainly could not come up with the 2,000 euro are classified as being financially fragile. In a follow-up question, these respondents were asked to provide an estimate of the amount they could come up with within a month. For this question, respondents could provide an amount or tick a box stating that they did not know the answer.

There are four elements of the financial fragility indicator that are important to highlight. Firstly, as explained in Lusardi et al. (2011), it is essential to pose the question in terms of the respondent's confidence about the ability to come up with 2,000 euro rather than a yes or no answer, because we are dealing with an unanticipated event in the future. Second, the question measures the capacity to come up with funds, not whether households have those funds, as there may be many methods one uses to deal with shocks, for example relying on family and friends or borrowing. Third, the 2,000 euro figure mentioned in the question is meant to represent a midsize shock, measuring, for example, the amount needed to cover an unanticipated expense such as a car repair, a legal expense, or a home repair (Lusardi et al., 2011).[5] Fourth, the

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[4] For brevity, results of this test are not reported but are available from the authors upon request.
[5] Lusardi et al. (2011) used $2,000 rather than €2,000 as the threshold.

questions ask respondents whether they can come up with 2,000 euro within a month rather than immediately; thus, respondents have a relatively long timeframe to consider and access all available resources. This measure does more than measure very short-term liquidity constraints.

To evaluate how individuals intend to cope with a financial emergency, respondents were further asked, "If you were to face a €2,000 equivalent unexpected expense in the next month, how would you come up with the funds you need?" Note that for financially fragile respondents who are uncertain about their ability to come up with €2,000 within a month but provided an estimate of the amount they could come up with, this question was changed slightly and showed the estimated amount instead of the 2,000 euro figure. Moreover, for financially fragile respondents who did not provide an estimate, 'a small unexpected expense' was used instead of the 2,000 euro figure. Respondents were presented with a list of 15 options (they could also select "Other" or "I do not know") and were instructed to select one or more coping methods with no limitation on the number of methods that could be chosen. The list was randomized on the screen to avoid response-order bias. The list consisted of the following coping methods: (1) draw from cash or checking accounts, (2) draw from savings accounts, (3) borrow or ask for help from my family, (4) borrow or ask for help from my friends (not members of my family), (5) liquidate or sell investments, (6) draw from annuity or single premium insurance, even if I have to pay a penalty or taxes, (7) sell my home, (8) use my credit card, (9) open or use a home equity line of credit or a second mortgage (with house as collateral), (10) take out a personal loan or revolving credit (without collateral), (11) use a short-term mini loan, (12) ask for a payroll advance[6], (13) work overtime, get a second job, or another member of my household would go to work (longer), (14) pawn an asset I own at a pawnshop (e.g. the 'Stadsbank van lening' or pawnshop 'Used products'), (15) sell things I own (except my home), for example via marktplaats.nl.

The data from the financial fragility module is enriched with demographic information from the CentERpanel, which include data on sex, age, educational level, household size, household income, housing, and labor market status. Net monthly household income is categorized into quartiles as follows: (1) incomes up to 2,000 euro, (2) incomes between 2,000 and 2,750 euro, (3) incomes between 2,750 and 3,600 euro and (4) incomes above 3,600 euro. We categorized labor market status into (self-)employed, unemployed and retired. Unemployed

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[6] A short-term mini loan (also known as 'flitskrediet' in the Netherlands) is a loan with a short duration and relatively low loan amount (often from a few tens to hundreds of euros). The interest rates on these loans are often high with a maximum of 14% on an annual basis. Payroll advance to refers to a short-term loan provided by the employer to cover an unexpected expense which cannot be delayed until the salary payday.

people consists of respondents who are looking for a job, are students, are occupationally disabled, are housekeepers, perform unpaid work while retaining benefits or do volunteer work.

In the financial literacy module, financial literacy was measured using the Big Three questions developed by Annamaria Lusardi and Olivia Mitchell (see Lusardi and Mitchell, 2011). These questions measure an individual's knowledge of basic concepts, such as the workings of inflation, interest rates, and risk diversification. We construct a financial literacy index that goes from zero (lowest financial literacy) to three (highest financial literacy) based on the number of correct answers to the Big Three financial literacy questions.

Respondents were also asked to report the expected number of correct answers to the Big Three financial literacy questions. We construct a measure of overconfidence in financial literacy by taking the self-assessed number of correct answers and subtracting the actual number of correct answers. Positive values (1 to 3) indicate overconfidence, negative values (-1 to -3) indicate underconfidence, and zero indicates a perfect assessment. Respondents were further asked to assess their knowledge of financial matters (self-assessed financial literacy) on a scale from 1 (very bad) to 7 (very good). Appendix A1 provides the exact wording of the questions in the financial literacy module.

The DNB Household Survey (DHS) in 2017 includes four questions that relate to probability numeracy (as suggested by Hudomiet et al., 2018). Since we are examining how households deal with unexpected shocks, it is useful to know how much respondents know about probability and risk, in addition to the basic financial literacy questions. Similar to the financial literacy index, we construct a probability numeracy index based on the number of questions a respondent answered correctly ranging from zero (lowest probability numeracy) to four (highest probability numeracy). Appendix A2 reports the wording of these questions.

Finally, respondents in the CentERpanel provide information on their assets and liabilities in the annual DHS. In section 4, we use data from the DHS 2016 questionnaire to obtain information on the share of respondents with one or more bank accounts with a negative balance.

III. Financial Fragility of Dutch Households

In this section, we present our findings on Dutch respondents' perceived capacity to cope with a financial emergency. We describe the level of financial fragility among Dutch households and how it correlates with different socioeconomic and demographic characteristics, financial

literacy, financial literacy confidence, and probability numeracy. Moreover, we study the determinants of financial fragility by estimating probit models.[7]

In Table 1, we provide descriptive statistics about financial fragility across a set of demographic and economic characteristics. The first row reports Dutch respondents' capacity to raise 2,000 euro within a month. About 14 percent of the respondents state they probably could not (4.6%) or certainly could not (9.1%) come up with 2,000 euro within a month in 2016. Comparing our results to those of Lusardi et al. (2011) who document that about 27 percent of Dutch households were financially fragile in 2009 (a period of economic crisis), we see that financially fragility among Dutch households has decreased over time.[8]

Lusardi et al. (2011) also document that nearly half of the American respondents were financially fragile in 2009, while in other European countries such as France, UK, and Germany, more than 35 percent of households were financially fragile.[9] One explanation for these differences in fragility might be related to the differences in the social welfare system. For example, compared to the US, the Netherlands has a basic state pension which covers everyone who lives or works in the Netherlands. Furthermore, the Netherlands also has a universal healthcare system, which is not the case for the US. Out-of-pocket health care spending per capita in the Netherlands ($605) is relatively low compared to the US ($1,122) (OECD, 2019).[10]

Recall that respondents who indicated that they probably or certainly could not come up with the 2,000 euro were asked to provide an estimate of how much money they could come up with within a month. 92 percent believe that they could come up with amounts below or equal to 1,000 euro and about 70 percent of the financially fragile respondents indicate that they could come up with amounts below or equal to no more than 500 euro.

Table 1 further illustrates how financial fragility varies with demographic and economic attributes. We find that for all variables, except for age, the difference in coping ability between the groups is statistically significant. Females and younger individuals are more likely to be

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[7] We also estimated ordered probit models. The estimation results were comparable in terms of statistical significance to those of the probit models and are available upon request from the authors.

[8] A recent survey administered by the Money Wise Platform (an initiative of the Ministry of Finance in collaboration with the financial sector, the education sector, researchers and consumer organizations to foster responsible financial behavior by consumers) concludes that one in three Dutch adults cannot come up with €2,000 in case of an immediate need. An important difference with our approach is that in our survey respondents have a month to come up with €2,000. Instead of measuring very short-term liquidity constraints, we allow respondents to access all available resources (including less liquid sources) consistent with the financial fragility measure proposed by Lusardi et al. (2011).

[9] In the TNS survey, the amount asked about for respondents from EU countries was set to €1,500. Therefore, our results are not fully comparable with those of Lusardi et al. (2011).

[10] These expenses are adjusted for differences in the cost of living.

financially fragile than males and individuals 65 and older, single-headed households are significantly more fragile, with more than 40 percent of those with children reporting that they probably or certainly would not be able to cope with a financial emergency. A possible explanation for these results is the sudden increase in household expenses which must thus be borne by a single income.[11] Furthermore, a large difference in the ability to cope is observed between renters and homeowners. Respondents who are renters (30.4%) as opposed to homeowners (6.7%) more often report being probably or certainly unable to come up with 2,000 euro. Another notable result is that respondents who are in charge of the household finances are significantly more financially fragile compared to those who are not in charge.

Turning to economic indicators, it is not surprising that the unemployed are significantly more fragile than employees and retirees. Retirees are the least financially fragile which is in line with the low poverty rates in this demographic group. Households with an income in the bottom quartile are significantly more financially fragile than other income groups. For instance, 4.4 percent of high-income households are probably or certainly unable to cope with a financial shock compared to 24.8 percent of low-income households. Similar to the results of Lusardi et al. (2011), our data indicate that the capacity to cope with financial shocks increases with educational attainment. Nevertheless, Lusardi et al. (2011) document that the level of coping capacity of American respondents with a college degree is relatively low, while in the Netherlands less than 8 percent of respondents with a college or graduate degree were classified as being financially fragile. Lastly, we use overdrawn bank accounts as a proxy for wealth (very low wealth) and note that, as expected, respondents with overdrawn bank accounts more often report that they are probably or certainty unable to cope with a financial emergency (45.2%) compared to other respondents (9.4%).

In summary, many Dutch households are fairly capable of dealing with financial shocks. More importantly, our results are consistent with those of Lusardi et al. (2011) in that we also find that financial fragility is more pronounced among females, younger individuals, the unemployed, less educated individuals, lower-income households and households with children. In addition, our results show a worrisome level of financial fragility among renters and those with overdrawn bank accounts.

Insert Table 1 about here

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[11] In fact, Lusardi et al. (2011) find that households with children (55%) more often report being probably unable or certainly unable to cope than households without children (46.5%). These results are also in line with those of Hasler and Lusardi (2019) who find that households with more children are more likely to be financially fragile.

Table 2 tabulates financial fragility and its correlation with several measures of financial literacy and probability numeracy. Respondents who state that they do not know the answer or refuse to answer are grouped together with those who provide incorrect answers. We find statistically significant differences in financial fragility across different levels of financial literacy and probability numeracy. One noticeable finding is that those who incorrectly answer the two simple financial literacy questions (interest rate and inflation) compared to those who incorrectly answered the more difficult question (risk) more often report being probably or certainly unable to cope.

Financial fragility decreases sharply as the number of correctly answered financial literacy questions increases. About 14 percent of the respondents had at most 1 of the financial literacy questions correct. This means that they answered either one or both of the two relatively more simple interest and inflation questions incorrectly. Thus, despite that from an early age on, one is taught about interest rates and inflation in schools in the Netherlands, we still observe that a few individuals in the sample lack knowledge of these two topics.

Turning to financial literacy confidence, respondents who are overconfident or underconfident are more likely to be financially fragile compared to those who correctly assess their financial literacy skills.[12] Moreover, the tabulation of financial fragility across different levels of self-assessed financial literacy shows that individuals who assess their financial knowledge as being above average are less likely to be financially fragile. Finally, the results document that expected coping ability increases with probability numeracy. Up to two correct probability answers, 17-26 percent of respondents are financially fragile compared to 7 percent of respondents with correct answers to all four probability numeracy questions. While the ability to cope with a financial emergency clearly increases with probability numeracy, we observe an even sharper gradient in financial fragility across the number of correct financial literacy questions. In particular, the fraction of respondents unable to come up with 2,000 euro within a month decreases from 31 percent of respondents with zero questions correct to 8 percent for respondents with all three questions correct. In summary, the data document that higher levels of financial literacy, probability numeracy, and a correct assessment of financial literacy are associated with higher levels of coping capacity.

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[12] Note that all respondents who reported that they did not know the answer or refused to answer all three questions indicated that they had zero questions correct so that they are classified as neither overconfident nor underconfident. This specific subgroup more often reports being unable to cope than those who correctly asses their financial literacy.

Recall that the results from Table 1 showed that females are significantly more financially fragile than males. A literature overview by Bucher-Koenen, Lusardi, Alessie and Van Rooij (2017) on gender differences in financial literacy shows that females consistently score lower on financial literacy and are less likely to answer simple financial knowledge questions correctly. Females are also more likely to rate themselves lower than males when it comes to self-assessed financial literacy. Moreover, Hudomiet et al. (2018) find that females have lower levels of probability numeracy than males as well. For that reason, we examine whether this is also true for females in our sample and report the results in Table 8 in appendix A3. In brief, our results support previous findings on gender differences in financial literacy and probability numeracy. Compared to males, females in our sample are not only significantly more financially fragile but also score lower on financial literacy, more often underestimate their financial literacy skills and have lower probability numeracy.

Insert Table 2 about here

The bivariate associations so far help to identify financially vulnerable subgroups in the population. To gain further insights into the determinants of financial fragility, we investigate what relations exist in a multivariate analysis. For this purpose, we run several multivariate probit regressions linking financial fragility to a set of demographic and other variables. Table 3 reports the average marginal effects obtained from these probit regressions. The dependent variable is equal to 1 if the respondent reports being probably or certainly able to cope and zero if the respondent reports being probably or certainly not able to cope with a financial emergency. Model 1 includes only demographic and economic characteristics. In model 2 we add the financial literacy index and in model 3 we add an indicator of financial literacy overconfidence (which equals 1 if the financial literacy confidence index is positive) and one for financial literacy underconfidence (which equals 1 if the financial literacy confidence index is negative). In model 4 we include a dummy that is equal to 0 if a respondent has zero, one or two of the probability numeracy questions correct (low probability numeracy) and is equal to 1 if a respondent has three or more questions correct (high probability numeracy). Finally, in model 5, we include an indicator of financial wealth, which is a dummy equal to 1 if a respondent had one or more bank accounts with a negative balance.[13]

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[13] The results in this column should be taken with a grain of salt because the variable is endogenous.

The results reported in Table 3 largely confirm the findings of the descriptive statistics. First, similar to the findings of Lusardi et al. (2011), we find that financial resilience increases with age and educational attainment. Contrary to our expectations and the findings of Lusardi et al. (2011), gender has no effect on the level of coping capacity. Thus, after accounting for other background characteristics, the difference in capacity to cope between males and females disappears. The results confirm that an increase in the number of children in a household significantly reduces the likelihood of being able to cope. Being a homeowner is strongly associated with the capacity to cope. Compared to renters, homeowners are 10 to 12 percentage points more likely to able to cope with a financial shock. The results show further that economic characteristics such as labor market status and household income are associated with financial fragility. The capacity to cope increases significantly with household income and those who are unemployed are significantly more fragile than others.

Turning to the additional variables in models 2, 3, and 4, we find a strong link between financial literacy, financial literacy underconfidence, probability numeracy and financial fragility. Interestingly, those who are underconfident in their financial literacy skills are more likely to be financially fragile compared to those who correctly asses their financial literacy skills. Lusardi et al. (2011) used measures for risk literacy in their models for explaining coping capacity but did not find an association between risk literacy and the ability to cope. Our results suggest that the financial literacy and probability numeracy measures we use are better predictors for individuals' coping ability. It is noticeable that the effect of the financial literacy and probability numeracy variables is statistically significant even after controlling for education. Thus, financial literacy and probability numeracy have an effect on financial fragility above and beyond that of education. These results are in line with the findings of Hasler and Lusardi (2019), who also find that financial literate households are significantly less likely to be financially fragile and the effect seems to hold even after controlling for socioeconomic factors such as education and income. Another research by Brunetti, Giarda and Torricelli, (2016), also confirm these findings. Using data from the Bank of Italy Survey on Household Income and Wealth, Brunetti et al. (2016) show that the higher the degree of financial literacy, the lower the probability of financial fragility. Noticeably, the importance of financial literacy diminishes a bit when controlling for probability numeracy. Finally, the results from model 5 indicate that having one or more bank accounts in the red significantly increases the likelihood of being financially fragile. Respondents who have accounts with a negative balance are 13.3 percentage point less likely to be able to cope with a financial emergency than respondents without such negative overdrafts.

Summarizing, most of the findings from the probit regressions have their expected sign and confirm the results from the univariate analysis. However, gender is an exception as it does not play a role in explaining the ability to cope after taking into account sociodemographic background information. Finally, our measures of (financial) knowledge and confidence are strong predictors of the ability to cope with financial emergencies and their effect goes above and beyond that of education.

Insert Table 3 about here

IV. Methods of Coping with Financial Emergency of Dutch Households

In this section, we examine the methods respondents intend to use in case of a financial emergency and the socio-demographic and economic characteristics influencing the choice of coping methods. As mentioned in section II, respondents were presented with a list of 15 possible coping methods and were instructed to choose one or more of these coping methods. The list was randomized to avoid response-order bias. Therefore, we first check whether randomization affects the answering pattern by tabulating a variable which indicates which coping method was mentioned first with each coping method.[14] Then, we carry out a χ^2 test to investigate whether the choice of coping method is independent of which coping method was mentioned first.

For most coping methods, we fail to reject the null hypothesis that randomization does not affect the answering pattern at the five percent level. However, for the coping method drawing from a saving account, we can only reject the null hypothesis at the one percent level. For the response options drawing from cash or checking accounts and taking out a personal loan or revolving credit (without collateral), randomization does seem to play a role. These findings can possibly be explained by the fact that drawing from cash or checking accounts and savings accounts are the most chosen methods (see Table 4). Note that these coping methods relate to very liquid assets because funds on these accounts can easily be withdrawn. By mentioning these methods first, it may further increase the possibility of choosing these coping methods because respondents might perceive them as the easiest and fastest way of coping with a financial emergency. In contrast, taking out a personal loan or revolving credit is only chosen by 2.5 percent of the respondents. Unsecured loans are less attractive compared to the other

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[14] Results available upon request.

methods because they usually charge high interest rates. We suspect that mentioning a less attractive method, such as unsecured loans, first does not lead respondents to choose this option unless they have a strong preference for this method.

Table 4 reports the coping methods respondents chose and the distribution among respondents relying on single versus multiple coping methods. In the top panel of the table, the coping methods are combined into eight categories as follows: **Accounts:** (1) draw from cash or checking accounts, (2) draw from savings account; **Family or friends:** (3) borrow or ask for help from my family, (4) borrow or ask for help from my friends (not members of my family); **Sell Non Liquid Assets:** (5) liquidate or sell investments, (6) draw from annuity or single premium insurance, even if I have to pay a penalty or taxes, (7) Sell my home; **Credit card:** (8) use my credit card; **Loan with collateral:** (9) open or use a home equity line of credit or a second mortgage (with house as collateral); **Loan without collateral:** (10) take out a personal loan or revolving credit (without collateral), (11) use a short-term payday loan, (12) ask for a payroll advance loan; **Work more:** (13) work overtime, get a second job, or another member of my household would go to work (longer); **Sell possessions:** (14) pawn an asset I own at a pawnshop (e.g. the 'Stadsbank van lening' or pawnshop 'Used products'), (15) Sell things I own (except my home), for example via marktplaats.nl.[15]

The results in the top panel of Table 4 show that most of the respondents chose using funds from their accounts (89 percent) as a method of coping with financial emergencies. As mentioned earlier, these are typically liquid assets and may be the easiest way of obtaining the needed funds. Moreover, similar to Lusardi et al. (2011), we find that the use of funds from savings accounts is the most common method of coping among Dutch households (see the panel on individual coping methods). Nevertheless, respondents choosing drawing funds from their accounts as a coping method might not have sufficient funds on their accounts. In fact, according to our background information, 6 percent of the respondents who chose using funds on their accounts as a coping method have one or more overdrawn bank accounts. This is evident from Table 5, which tabulates the share of respondents with one or more accounts with a negative balance for each coping method. Not surprisingly, respondents choosing other coping methods than using the balance on their bank accounts more often have one or more bank accounts with a negative balance. For instance, 19 percent of respondents who ask family or friends for help have bank accounts with a negative balance. Nevertheless, also among the group who resort to family or friends as a coping method, the majority actually had at least

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[15] The category labels were not shown in the survey.

some funds on their accounts. A possible explanation is that, while respondents often can overdraw their bank accounts up to a limit, this typically comes with a hefty fee.[16]

Turning back to the first column of Table 4, we find that in total roughly one in six respondents would resort to their family or friends and 9.1 percent would use their credit card in the case of financial emergencies. This percentage is somewhat surprising considering the fact that credit cards are not widely used in the Netherlands.[17] It is apparent from the table that the other coping methods were less popular among the respondents. It is noticeable that Dutch households are unlikely to cope with financial emergencies by taking out loans.

Summarizing our main results, we find that individuals intend to rely on a variety of coping methods when faced with a financial emergency. Similar to what Lusardi et al. (2011) found for the US, we find that individuals do not only rely on formal coping methods, such as drawing funds from their accounts, but they also rely on informal methods, such as the support of their friends and family.

The last three columns of Table 4 present the coping methods chosen by individuals who selected one, two, and three or more coping methods. Note that one in three of the respondents would rely on more than one method to be able to cope. Within the group of financially fragile households, about 65 percent would rely on two or more coping methods. This is shown in Table 6, which tabulates the number of coping methods that financially fragile households would use in case of a financial emergency.

From the results reported in the second column of Table 4, it is clear that using funds from bank accounts is the method that is most commonly used in isolation and other methods are seldom used in isolation. The last two columns of this table show the coping methods mentioned by individuals who selected two coping methods and those selecting three or more coping methods.[18] Approximately one in five of the respondents (22.5%) that selected a combination of two coping methods would rely on their networks of family and friends, and about one in eight (12%) would use their credit cards, both of which are seldom used in isolation. Moreover, the results indicate that also other coping methods are more frequently used in combination with other coping methods than on their own.

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[16] Interest rates on overdrawn accounts are often above 10 percent per year.
[17] There are different kinds of credit cards available in the Netherlands. Most credit cards in the Netherlands can be categorized as debit cards; this is because any outstanding debts on the card at the end of the month are also redeemed at the end of the month and no interest is paid on this amount. One limitation of this study is that we did not distinguish between the different types of credit cards in the survey.
[18] The percentages in the first panel for the third column do not sum up to 200 percent. Instead, they sum up to 143 percent because 57 percent of the respondents chose two methods within the same category.

Overall, these findings suggest that, in case of a financial emergency, a majority of respondents would rely on their cash, checking, or savings accounts. This method of coping is used by almost 9 in 10 respondents using one single coping method. Apart from relying on bank accounts, resorting to family or friends and using a credit card seem to be the next most popular method of coping among our respondents, and even more so among respondents selecting a combination of coping methods and within the group of financially vulnerable respondents.

Insert Tables 4, 5 and 6 about here

We estimate next probit regressions to investigate the relationship between the choice of one of the eight categories of coping methods and various demographic and economic characteristics. We employ the same variables as in Table 3 and Table 7 presents average marginal effects from probit estimations.[19,20] The findings suggest that while we found that gender is not related to coping capacity, it is related to the coping strategies employed. Specifically, females are less likely than males to sell non-liquid assets, to use a credit card or take out a secured loan. Note that many of these findings are in general consistent with those found by Lusardi et al. (2011) for the US, even though they do not have information on those who could not cope with an emergency. This applies as well for the significant negative relationship we find between age and the choice of using family or friends as a coping method. Older individuals are less likely to resort to family or friends compared to younger individuals. Specifically, individuals 65 years and older are 7 percentage points less likely to choose family or friends as a coping method compared to individuals who are younger than 55. One possible explanation consistent with this finding is that children more often rely on their parents than the other way around. Although we do not find an association between the number of children in a household and the choice of coping method, we do find that couples are less likely to select selling non-liquid assets, using a credit card and selling possessions (significant at the 10 percent level only) as coping strategies compared to single households. We observe few

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[19] We ran Chow tests to assess whether we should run separate regressions for those who are financially fragile and those who are not financially fragile. The results, however, indicated that for most of the coping categories, the regressions can be pooled.

[20] Due to few observations in the age category 'younger than 40' for the coping method 'loan with collateral' the coefficient for this age category could not be predicted, and 156 observations were dropped. In order not to lose these observations, we combined the age category 'younger than 40' and '40-54' into one: 'younger than 55'. Respondents with missing values that chose do not know at the question of the coping methods are excluded from the analysis.

significant relationships between economic attributes such as labor market status or household income and the selection of coping strategies.

Higher educated individuals appear more likely to sell their non-liquid assets in case of a financial emergency, and they are less likely to sell their personal belongings in order to be able to cope.[21] Being a homeowner is also associated with the choice of coping methods. The regression results point to some links between financial literacy, financial literacy underconfidence, and probability numeracy and the coping strategies chosen by respondents. While financial literacy overconfidence does not predict the choice of coping methods, those who are underconfident in their financially literacy are less likely to sell non-liquid assets or work more (significant at the 10 percent level only). Probability numeracy is negatively associated with the choice of working more as coping strategy.

In summary, the results show that the choice of coping strategy is related to various demographic characteristics and to a lesser extent to economic attributes. Liquid assets (using funds from cash, savings and checking accounts) and the networks of family or friends come forward as important coping strategies. Individuals also tend to rely on credit cards in order to be able to cope with an emergency. Financial literacy, financial literacy confidence, and probability numeracy play a role in both the ability to cope with a financial emergency but also in the coping strategies one employs. Financial literate individuals more often reported being able to cope with a financial emergency and are more likely to choose using credit cards as a coping strategy. Similarly, probability numerate individuals are less financially fragile, and they are less likely to increase work hours in case of a financial shock. These results highlight the importance of financial literacy and numeracy on financial decision-making.

Insert Table 7 about here

V. Conclusions and Implications

In this study, we set out to assess the financial fragility of Dutch households by examining their ability to come up with 2,000 euro in a month in case of an unexpected need and how they intend to cope with such a need. We examined how various factors are associated with the ability to cope and the choice of the coping methods. Specifically, we investigated how financial

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[21] Note that investments and annuity or single premium insurances are typically owned by the higher educated and are uncommon among lower educated individuals.

literacy, financial literacy confidence, probability numeracy, and several demographic and economic characteristics are associated with coping capacity and the choice of coping methods.

We find that financial fragility is relatively low among Dutch households; about 14 percent are not confident or cannot come up with 2,000 euro in a month. While Lusardi et al. (2011) report that in 2009 the Netherlands was one of the countries with the lowest fraction of financially fragile households (27%), this fraction is now even lower. Irrespective of these positive findings, we still observe a worrisome level of financial fragility among certain groups of the population, in particular females, single households with children, renters, low-income households, the lower educated, individuals with overdrawn bank accounts, and the unemployed. Moreover, a majority of the financially fragile respondents report that they could come up with an amount that is below or equal to 500 euro within a month if an unexpected need were to arise (instead of the 2,000 euro that was mentioned in the earlier question). In addition, we employ having bank accounts with a negative balance as an indicator for being financially fragile and find that having deficit accounts is a strong predictor for being fragile and for the choice of coping methods.

Our findings confirm previous evidence on gender differences in financial literacy, financial literacy confidence, and probability numeracy. In contrast to earlier findings in the literature, we do not find a significant relationship between gender and the ability to cope. Nevertheless, gender does play a role in the choice of coping methods.

Our data allow us to explore a wide range of mechanisms households foresee using if they are faced with a financial shock. We considered formal methods, such as drawing funds from saving accounts as well as informal methods such as relying on friends and families. The methods range from cheaper options to costlier ways of coping. The findings show that a majority of Dutch households would rely mostly on formal methods; however, a sizeable fraction of households would also rely on less formal methods, such as their network of families and friends. Moreover, one in three households would rely on a combination of two or more coping methods in order to be able to cope with an unexpected need.

Lastly, we find that financial literacy, financial literacy confidence, and probability numeracy are associated with both financial fragility and the coping methods employed. These effects are observed in bivariate correlations but also in multivariate regressions after controlling for a wide set of sociodemographic and economic characteristics, including the respondent's level of education. These results highlight the importance of financial knowledge and numeracy for household financial decision-making and financial well-being.

Given that some groups are more financially vulnerable than others, future research and policymakers may focus on strengthening the ability of these groups to withstand financial shocks and safeguard them against the adverse effects of financial shocks. Our findings on the importance of financial knowledge and probability numeracy suggest that a potentially promising approach to tackle financial fragility may be to provide financial education programs which are aimed at improving households' ability to manage their resources. Studies show that improved financial literacy can help individuals make better financial decisions (Lusardi and Mitchell, 2006; Van Rooij et al., 2011).

One option is adding these programs in Dutch schools. For instance, the levels of financial literacy found in the data suggest that there might be room to improve knowledge of basic concepts. It may be helpful to identify ways of encouraging these households to save and build up financial reserves. One way to do so is by implementing financial education in the workplace, especially targeting vulnerable subgroups.

In conclusion, our research has shed light on the financial fragility of Dutch households and the coping methods they would employ in case of a financial shock. It examined how these are related to financial literacy, probability numeracy, and various demographic and economic characteristics. We were able to identify the groups at risk and some of the determinants of financial fragility. This work may serve as a starting point for future research by academics and policymakers to identify possible solutions. In summary, some Dutch household are skating on thin ice and it would be useful to think of policy and programs that can provide some support to these households, were the ice going to break.

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Table 1. Financial fragility, by economic and demographic characteristics

			Able to raise 2,000 euro within a month?			
		Number of	Sure	Probably	Probably not	Sure not
		Individuals	%	%	%	%
All		1,716	73.4	13.0	4.6	9.1
Gender	Men	934	79.2	10.7	4.2	6.0
	Women	782	66.5	15.7	5.1	12.7
Age	20-39	199	68.1	13.6	7.4	10.9
	40-54	471	72.3	12.8	4.4	10.5
	55-64	378	72.3	12.8	5.9	9.0
	65+	668	78.1	12.9	2.5	6.5
Household	Single, no children	345	62.6	14.9	6.9	15.6
type	Single, with children	41	43.3	17.1	9.4	30.2
	Couple, no children	809	81.2	11.3	3.0	4.5
	Couple, with children	490	76.4	12.4	3.9	7.3
	Other	31	71.2	19.8	7.5	1.5
Accommodation	Renter	385	53.7	15.9	8.9	21.5
	Homeowner	1,331	81.6	11.7	2.8	3.9
In charge of the household finances	Yes	1,205	73.0	12.3	5.2	10.5
	No	511	76.7	14.6	3.1	5.7
Education	Elementary school or Pre-vocational Education	506	69.4	14.6	4.7	11.3
	Secondary Education	557	70.8	13.6	4.4	11.2
	College or graduate education	653	82.8	9.6	4.8	2.7
Labor	Employed	825	77.4	12.0	4.1	6.5
market	Unemployed	320	57.9	15.7	8.2	18.3
status	Retirees	571	79.9	12.5	2.2	5.5
Household	1 (low)	444	59.4	15.7	6.8	18.0
Income quartiles	2	428	78.4	12.3	4.8	4.5
Monthly/net	3	429	82.6	11.9	1.8	3.7
	4 (high)	415	86.2	9.4	2.5	1.9
Accounts with a negative balance	0 accounts	1,402	77.7	12.9	3.8	5.6
	1 or more accounts	121	41.4	13.4	10.3	34.9

Notes: all frequencies are population weighted. Employment includes self-employment. Unemployment consists of people who are looking for a job, are occupationally disabled, do housekeeping, perform unpaid work while retaining benefits or do volunteer work and students. For all variables, except age, the difference in ability to cope between the groups is statistically significant.

Table 2. Financial fragility, by financial literacy, financial literacy confidence and probability numeracy[a]

			Able to raise 2,000 euro within a month?			
		Number of Individuals	Sure %	Probably %	Probably not %	Sure not %
Financial literacy						
Interest rate question	Incorrect	148	58.9	16.1	9.8	15.2
	Correct	1,568	75.1	12.6	4.0	8.3
Inflation question	Incorrect	256	60.0	15.5	7.3	17.2
	Correct	1,460	76.5	12.4	4.0	7.2
Risk question	Incorrect	666	64.2	17.2	4.8	13.9
	Correct	1,050	80.0	9.9	4.5	5.6
Summary of big 3 questions						
Number of correct answers	0	64	41.9	26.5	12.5	19.1
	1	169	65.1	13.5	4.3	17.2
	2	540	69.1	14.6	4.9	11.5
	3	943	81.1	10.5	3.8	4.7
Financial Literacy overconfidence	<= -2	136	61.6	17.9	6.7	13.8
(#correct big 3 self-assessed -	-1	447	71.3	12.9	6.5	9.2
#correct big 3 observed)[b]	0	963	76.9	12.1	2.9	8.1
	>= 1	170	70.4	`1.2	6.4	10
Self-assessed financial literacy	Very bad	47	58.2	21.7	4.7	15.4
	3	122	63.6	16.6	12.0	7.8
	4	275	66.0	17.5	3.9	12.7
	5	519	75.3	13.0	3.5	8.2
	6	608	77.6	11.0	4.7	6.8
	Very good	145	78.9	5.2	2.9	13.0
Probability Numeracy						
Number of correct answers	0	74	62.0	11.8	6.54	19.7
	1	209	67.4	16.2	4.8	11.6
	2	418	68.5	14.7	4.8	12.0
	3	509	76.4	12.7	4.7	6.2
	4	251	85.6	7.6	2.4	4.4

Notes: all frequencies are population weighted. Incorrect answers include do not knows and refusals. All tabulations are based on 1,716 observations, excluding probability numeracy which is based on 1,461 observations.
a. For all variables the difference in ability to cope between the groups is statistically significant.
b. Groups of individuals with a financial literacy confidence index of -3 and -2 are combined and those with 1, 2 or 3 are also combined.

Table 3. Probit regressions explaining financial fragility

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Average probability of coping			86.4%		
Female	-0.0176	-0.0112	-0.00202	-0.00174	-0.00712
	(0.0127)	(0.0129)	(0.0130)	(0.0140)	(0.0133)
Age (Reference= Younger than 40)	0.0568**	0.0522*	0.0500*	0.0716**	0.0803***
40-54	(0.0273)	(0.0267)	(0.0257)	(0.0296)	(0.0306)
	0.0460	0.0412	0.0344	0.0597*	0.0712**
55-64	(0.0292)	(0.0285)	(0.0278)	(0.0321)	(0.0325)
	0.0723**	0.0647*	0.0589*	0.0714*	0.0735*
Older than 65	(0.0350)	(0.0347)	(0.0339)	(0.0392)	(0.0393)
Number of kids	-0.0249***	-0.0252***	-0.0250***	-0.0278***	-0.0198**
	(0.00752)	(0.00755)	(0.00753)	(0.00845)	(0.00790)
Couple	0.0228	0.0235	0.0218	0.0256	0.0217
	(0.0192)	(0.0191)	(0.0190)	(0.0195)	(0.0188)
Homeowner	0.120***	0.112***	0.109***	0.104***	0.0807***
	(0.0220)	(0.0215)	(0.0210)	(0.0222)	(0.0191)
Labor Market Status (Reference= (self-) Employed)					
Unemployed	-0.0359*	-0.0341*	-0.0342*	-0.0488**	-0.0337*
	(0.0193)	(0.0192)	(0.0192)	(0.0212)	(0.0204)
Retired	0.00327	0.00512	0.00582	0.00310	0.00653
	(0.0250)	(0.0250)	(0.0249)	(0.0252)	(0.0250)
Educational Level (Reference= Elementary or pre-vocational education)					
Secondary education	0.0108	0.00753	0.00439	-0.00913	(0.0173)
	(0.0195)	(0.0191)	(0.0187)	(0.0196)	0.00697
College or graduate education	0.0464**	0.0404**	0.0333*	0.0260	(0.0188)
	(0.0186)	(0.0185)	(0.0182)	(0.0191)	-0.00985
In charge of the household finances	-0.0157	-0.0183	-0.0222*	-0.0212	-0.00985
	(0.0126)	(0.0124)	(0.0123)	(0.0134)	(0.0137)
Household income quartiles (monthly & net; in euro) (Reference= first income quartile)					
2	0.0465*	0.0444*	0.0436*	0.0379	0.0362
	(0.0239)	(0.0235)	(0.0233)	(0.0242)	(0.0238)
3	0.0606**	0.0582**	0.0551**	0.0494*	0.0540**
	(0.0246)	(0.0243)	(0.0247)	(0.0259)	(0.0247)
4 (high)	0.0748***	0.0706***	0.0700***	0.0612**	0.0678***
	(0.0242)	(0.0240)	(0.0238)	(0.0245)	(0.0240)
Additional Variables					
Financial Literacy		0.0188**	0.0247***	0.0172*	0.0139
		(0.00758)	(0.00815)	(0.00940)	(0.00902)
Financial Literacy overconfidence			-0.0146	-0.00892	-0.00373
			(0.0244)	(0.0246)	(0.0224)
Financial Literacy underconfidence			-0.0471***	-0.0328**	-0.0227
			(0.0156)	(0.0165)	(0.0153)
Probability Numeracy				0.0524***	0.0602***
				(0.0152)	(0.0142)
Has bank accounts with a negative balance					-0.133***
					(0.0187)
N	1,716	1,716	1,716	1,461	1,353
Log likelihood	-430.0	-426.95	-422.04	-351.07	-290.61
Pseudo-R^2	0.1701	0.1760	0.1855	0.2037	0.2658

Notes: The table reports average marginal effects. The dependent variable is a dummy equal to 1 if the respondent reports being certainly or probably able to cope and zero if the respondent reports being certainly or probably unable to cope. The results of models 1, 2, and 3 are based on 1,716 observations and model 4 is based on 1,461 observations. Unemployment consists of people who are looking for a job, are occupationally disabled, do housekeeping, perform unpaid work while retaining benefits or do volunteer work and students. Standard errors clustered at the household level are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4. Distribution of coping methods used by all respondents and by respondents relying on single or multiple coping methods
Percent using indicated method

Coping Methods	Share of all respondents	Share of indicated group[a]		
		Respondents choosing one method	Respondents choosing two methods	Respondents choosing three or more methods
Categories				
Accounts	89.2	88.6	90.8	89.0
Family or Friends	16.2	4.6	22.5	66.6
Sell Non-Liquid Assets	2.4	0.5	2.9	11.0
Use credit card	9.1	0.6	11.7	49.8
Loan with collateral	1.1	0.6	1.2	3.8
Loan without collateral	3.7	0.4	4.0	21.4
Work more	4.3	3.7	4.0	7.8
Sell Possessions	4.9	1.0	6.0	23.9
Individual Methods				
Draw from cash or checking accounts	31.7	14.7	64.0	54.1
Draw from savings accounts	73.1	74.0	81.6	56.6
Liquidate or sell investments	2.1	0.5	2.9	7.8
Draw from annuity or single premium insurance, even if I have to pay a penalty or taxes	0.1	0.1	0.0	0.3
Borrow or ask for help from my family	14.8	4.5	20.7	48.7
Borrow or ask for help from my friends (not members of my family)	3.5	0.1	3.8	17.3
Use credit card	8.7	0.6	11.7	38.3
Open or use a home equity line of credit or a second mortgage (with house as collateral)	1.1	0.6	1.2	2.9
Take out a personal loan or revolving credit (without collateral)	2.5	0.3	2.7	11.0
Use a short-term payday loan	0.7	0.1	0.6	3.5
Ask for a payroll advance loan	0.9	0.0	0.7	4.9
Pawn an asset I own at a pawnshop (e.g. the 'Stadsbank van lening' or pawnshop 'Used products')	0.3	0.0	0.0	2.0
Work overtime, get a second job, or another member of my household would go to work (longer)	1.5	0.3	2.6	4.8
Sell things I own (except my home), for example via marktplaats.nl	4.5	1.0	6.0	16.8
Sell my home	0.1	0.0	0.0	0.4
Other	2.7	3.4	1.4	1.3
I do not know	3.4	0.0	0.0	23.1
Memoranda				
No. of observations	1,675	1,143	347	185
Share of all respondents using indicated number of coping methods	100	68.2	20.7	11.1

a.   All frequencies are population weighted.

Table 5. Percentage of respondents with deficit accounts across coping method

Coping methods	%
Accounts	6.0
Family or Friends	19.2
Sell Non-Liquid Assets	0.0
Use credit card	19.4
Loan with collateral	25.0
Loan without collateral	25.0
Work more	18.8
Sell Possessions	19.2

Notes: The results are based on 1,523 observations and 7.9 percent of all respondents had 1 or more accounts with a negative balance.

Table 6. Distribution of the number of coping methods used by financially fragile respondents

No. of coping methods used	%
One	35.1
Two	34.7
Three	24.3
Four	4.5
Five	1.0
Six	0.5

Table 7. Probit regressions explaining the choice of categories of coping methods with economic and demographic characteristics[a]

Variables	Accounts	Family or Friends	Sell Non-Liquid Assets	Credit Card	Loan with collateral	Loan without collateral	Work more	Sell Possessions
			Dependent Variable: dummy= 1 when respondent selected indicated category					
Female	0.0205	0.0178	-0.0216***	-0.0376**	-0.0115**	-0.00849	-0.00428	0.00152
	(0.0145)	(0.0180)	(0.00792)	(0.0164)	(0.00564)	(0.00935)	(0.00833)	(0.0101)
Age (Reference= Younger than 55)								
55-64	-0.00748	-0.0697**	-0.0204*	-0.0226	-0.000846	0.00663	-0.00492	-0.0113
	(0.0208)	(0.0291)	(0.0121)	(0.0201)	(0.00818)	(0.0164)	(0.0109)	(0.0150)
Older than 65	-0.0114	-0.102**	-0.00450	0.0242	0.00488	-0.0267	0.000960	-0.0233
	(0.0285)	(0.0414)	(0.0175)	(0.0350)	(0.0126)	(0.0196)	(0.0195)	(0.0184)
Number of kids	-0.00887	0.00452	-0.00482	0.000467	-0.000582	0.00177	0.00669	0.00332
	(0.00972)	(0.0110)	(0.00471)	(0.00951)	(0.00322)	(0.00522)	(0.00492)	(0.00576)
Couple	0.0243	-0.0427	-0.0254*	-0.0641**	0.000382	0.0127	-0.0123	-0.0279*
	(0.0209)	(0.0265)	(0.0135)	(0.0281)	(0.00696)	(0.0116)	(0.0112)	(0.0157)
Homeowner	0.0501**	-0.0704***	0.0232***	0.00133	0.00834	0.0177*	-0.0115	-0.00611
	(0.0206)	(0.0253)	(0.00773)	(0.0200)	(0.00625)	(0.00954)	(0.0129)	(0.0119)
Labor Market Status (Reference= (self-) Employed)								
Unemployed	-0.0420	0.0240	0.0234	0.000953	0.0154	-0.0180	-0.00880	0.00186
	(0.0267)	(0.0258)	(0.0178)	(0.0269)	(0.0115)	(0.0121)	(0.0159)	(0.0170)
Retired	0.0474**	-0.00830	0.000417	-0.0322	0.00609	-0.000252	-0.0263	-0.0197
	(0.0232)	(0.0381)	(0.0133)	(0.0302)	(0.00907)	(0.0241)	(0.0162)	(0.0162)
Educational Level (Reference= Elementary or pre-vocational education)								
Secondary education	0.0187	0.00361	0.0214**	0.0243	-0.000367	0.0124	-0.000716	-0.0320**
	(0.0210)	(0.0245)	(0.00834)	(0.0205)	(0.00847)	(0.0127)	(0.0116)	(0.0146)
College or graduate education	0.0277	-0.000247	0.0357***	0.0157	-0.00358	0.00960	-0.0138	-0.0267*
	(0.0216)	(0.0255)	(0.00902)	(0.0202)	(0.00757)	(0.0133)	(0.0108)	(0.0159)
In charge of the household finances	-0.0168	0.00878	0.000852	0.0162	-0.00342	0.0135	-0.00693	0.0138
	(0.0143)	(0.0181)	(0.0104)	(0.0169)	(0.00657)	(0.00959)	(0.00959)	(0.0104)
Household income quartiles (monthly & net; in euro) (Reference= first income quartile)								
2	-0.0185	-0.0484*	0.00592	-0.00195	-0.00372	-0.0104	-0.00479	-0.00307
	(0.0217)	(0.0272)	(0.0137)	(0.0197)	(0.0100)	(0.0170)	(0.00995)	(0.0150)
3	-0.00741	-0.0327	0.00897	0.0396	-0.00683	-0.0169	0.00897	-0.0158
	(0.0240)	(0.0309)	(0.0138)	(0.0247)	(0.00948)	(0.0176)	(0.0139)	(0.0145)
4 (high)	0.0442**	-0.0396	-0.0121	0.0517*	-0.0101	-0.0209	0.00255	-0.0207
	(0.0210)	(0.0329)	(0.0122)	(0.0288)	(0.0106)	(0.0180)	(0.0127)	(0.0154)
Additional Variables								
Financial Literacy	-0.00614	-0.00937	0.0130	0.0237*	-0.00280	-0.0101	-0.00321	-0.00161
	(0.0107)	(0.0136)	(0.00887)	(0.0136)	(0.00369)	(0.00674)	(0.00540)	(0.00637)
Financial Literacy overconfidence	-0.0235	-0.0155	0.0156	-0.000413	0.00609	-0.000468	0.0223	0.0181
	(0.0275)	(0.0299)	(0.0213)	(0.0305)	(0.0117)	(0.0157)	(0.0169)	(0.0219)

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Financial Literacy underconfidence	0.00107	-0.00331	-0.0319***	0.00554	-0.000681	0.0136	-0.0153*	-0.000138
	(0.0167)	(0.0207)	(0.00633)	(0.0179)	(0.00518)	(0.0120)	(0.00811)	(0.0103)
Probability Numeracy	0.0222	0.0166	0.00260	0.0161	0.00670	0.00877	-0.0185**	0.0166
	(0.0166)	(0.0196)	(0.00885)	(0.0163)	(0.00605)	(0.0100)	(0.00908)	(0.0104)
N	1,426	1,426	1,426	1,426	1,426	1,426	1,426	1,426
Log likelihood	-372.6	-496.8	-145.6	-422.0	-90.1	-199.2	-163.1	-207.7
Pseudo-R^2	0.074	0.075	0.186	0.046	0.067	0.051	0.088	0.083

Notes: The table reports average marginal effects. a. The categories were constructed as follows (some are a combination multiple coping methods): Accounts= draw from cash or checking accounts, draw from savings account; family or friends= borrow or ask for help from my family, borrow or ask for help from my friends (not members of my family); Sell Non Liquid Assets= liquidate or sell investments, draw from annuity or single premium insurance, even if I have to pay a penalty or taxes, sell my home; Credit card= use credit card; Loan with collateral = open or use a home equity line of credit or a second mortgage (with house as collateral); Loan without collateral= take out a personal loan or revolving credit (without collateral), use a short-term min loan, ask for a payroll advance; work more= work overtime, get a second job, or another member of my household would go to work (longer), other; sell possessions= pawn an asset I own at a pawnshop (e.g. the 'Stadsbank van lening' or pawnshop 'Used products'), sell things I own (except my home), for example via marktplaats.nl. Unemployment consists of people who are looking for a job, are occupationally disabled, do housekeeping, perform unpaid work while retaining benefits or do volunteer work and students. The dependent variable equals 1 when the respondent selected a method in the indicated category as either the only method or one of two or three coping methods used. Standard errors clustered at the household level are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix A1. Financial literacy questions

The "Big Three" financial literacy questions (correct answers are in bold):

1. Interest question: Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? **More than $102** / Exactly $102 / Less than $102 / Do not know/ Refuse to answer **% of correct answers: 91.4**

2. Inflation question: Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? More than today / Exactly the same / **Less than today** / Do not know / Refuse to answer **% of correct answers: 85.1**

3. Risk question: Please tell me whether this statement is true or false. "Buying a single company's stock usually provides a safer return than a stock mutual fund." True / **False** / Do not know / Refuse to answer **% of correct answers: 61.2**

Expected number of correct answers question:
The previous three questions were about savings account and stock investment returns. How many questions do you think you have answered correctly? None / One / Two / All three / Do not know / Refuse to answer

Self-assessed financial literacy question:
On a scale from 1 to 7, where 1 means very low and 7 means very high, how would you assess your knowledge of financial matters? **Respondents could also state that they do not know**

Appendix A2. Probability numeracy questions

Now we would like to ask you some questions about the chances of some events. Please answer the questions on a scale from 0 to 100, where 0 means 'there is absolutely no chance the event will happen' and 100 means 'the event is absolutely sure to happen'.

1. Consider that you take one ball from a bowl that holds 10 balls without looking. The bowl has 10 white balls and no red balls. What is the percent chance that the ball you take is red? Please answer the questions on a scale from 0 to 100, where 0 means 'there is absolutely no chance of a red ball' and 100 means 'absolutely sure to take a red ball'. **Answer: 0- % of correct answers: 84.5**

2. Now suppose you take one ball from a bowl that holds 10 balls without looking. The bowl has 7 white balls and 3 red balls. What is the percent chance that the ball you take is white? Please answer the questions on a scale from 0 to 100, where 0 means 'there is absolutely no chance of a white ball' and 100 means 'absolutely sure to take a white ball'. **Answer: 70- % of correct answers: 54.5**

3. Assume that the weather report accurately reports the chance of rain. Suppose the weather report tells you that the chance it will rain tomorrow is 70%. What is the chance it will NOT rain tomorrow?

Please answer the questions on a scale from 0 to 100, where 0 means 'there is absolutely no chance it will not rain tomorrow' and 100 means 'absolutely sure it will not rain tomorrow'. **Answer: 30- % of correct answers: 80.3**

4. Suppose that whether it rains in your town and whether it rains in Paris are unrelated. The chance that it will rain in your town tomorrow is 50%. The chance that it will rain in Paris is also 50%. What is the chance that it will rain both in your town and in Paris tomorrow? Please answer the questions on a scale from 0 to 100, where 0 means 'there is absolutely no chance it will rain in both cities tomorrow' and 100 means 'absolutely sure it will rain in both cities tomorrow'. **Answer: 25- % of correct answers: 25.5**

Appendix A3. Financial literacy, confidence, and probability numeracy by gender

Table 8. Tabulation of number of correct answers big3, financial literacy confidence, self-assessed financial literacy and number of correct probability numeracy answers by gender

	Male %	Female %
Big 3 questions: number of correct answers		
0	2.1	5.6
1	5.9	14.6
2	25.4	38.8
3	66.6	41.1
Self-assessed financial literacy		
Very bad	0.2	1.2
2	1.5	2.8
3	5.7	8.8
4	12.2	20.6
5	30.1	30.4
6	40.7	29.2
Very good	9.6	7
Financial Literacy confidence		
-3	0.8	1.5
-2	3.9	10.4
-1	20.6	32.6
0	64.7	45.9
1	9.7	8.2
2	0.4	1.3
3	0.0	0.1
Probability Numeracy questions: number of correct answers		
0	5.4	4.7
1	12.5	16.6
2	25	33.1
3	35.9	33.5
4	21.2	12.2

Notes: For all variables the difference between the groups is statistically significant.