Experience of financial challenges, retirement concerns and planning: Evidence from representative samples of workers in 16 countries

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Abstract

We examine whether an individual's inability to save in the last 12 months affects the extent to which they are concerned about their future financial security and their propensity to plan for retirement. We use an original survey based upon representative samples of working individuals in 16 countries. We show that individuals who were unable to save over the 12-month period prior to the survey are less likely to consider well-being in retirement as their major financial concern. They are also less likely to invest in supplementary pension funds than those who were able to accumulate savings. We provide evidence that these findings are robust under several specifications and are mediated by respondents' perceived income prospects and assessment of their current financial situations.

Keywords: financial challenges; retirement planning; private pension insurance; experience
JEL Codes: D14; G41; G51; J32

1 Introduction

Around the world, including in wealthy countries, a significant proportion of households face chronic financial struggles. According to a survey based on a representative sample of working adults in the US (PwC, 2020), in 2020 58% of workers would not be able to meet basic expenses if they were out of work for an extended period. Women are at even greater risk than men, since only 29% of them would be able to make ends meet during a period of prolonged unemployment. Furthermore, many households are increasingly having to cope with limited savings and accumulated debts. Of US workers 42% lack the ability to absorb even a minor shock: they have less than $1,000 saved to deal with unexpected expenses (PwC, 2020). In a financial emergency, these households might resort to extreme measures such as pawning their possessions, selling their home, or taking out a payday loan (Lusardi et al., 2011).

In this paper, we use a large original dataset to explore whether the experience of financial challenges affects the extent to which individuals are concerned about their future financial security and their propensity to plan for retirement. We define 'experience of financial challenges' as a self-assessed instance in which individuals were unable to save part of their income in the past 12 months.

Having to cope with an inability to save could either increase or decrease people's concerns about, and propensity to plan for, their retirement. On one hand, when facing adverse financial circumstances, many people tend to neglect issues related to their lifelong financial security such as well-being in retirement. Previous research has shown that financial constraints impede people's capacity to consider less imminent problems (Shah et al., 2012; Mani et al., 2013; Mullainathan and Shafir, 2013; Haushofer and Fehr, 2014): resource scarcity translates into myopic behaviour and thinking.

Conversely, people could develop stronger concerns about their future financial well-being if they have first-hand experience of financial challenges. Past negative incidents might improve people's ability to assess financial risk (Nisbett and Ross, 1980) and make them more aware of the need to plan for the future. This is because experience carries valuable information and thus can be considered 'a great teacher' (Marx et al., 2007).

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In previous studies, experience has been found to affect people's intention to adopt precautionary measures such as purchasing insurance to prevent the risk of future financial losses (Kunreuther, 1996; Michel-Kerjan, 2010; Innocenti et al., 2019).

The direction of the effect of experience of financial challenges on people's concerns about their financial security and their propensity to plan for retirement has important implications for the long-run governance of pension systems. If the experience of financial challenges makes people more inclined to worry about their retirement and plan for it, the long-run viability of defined contribution arrangements is at lower risk. By contrast, if an inability to save makes people less inclined to thinking about and planning for retirement, this suggests a renewed need for governments and other pension providers to intervene and support those in need.

Using original survey data from a sample of 18,000 workers across 16 countries, we present evidence of the effect of financial challenges on people's propensity to plan for retirement and to recognise future financial security as an important concern. We show that individuals who could not save part of their income in the past 12 months are less likely to consider well-being in retirement as their major financial concern. They also less likely to hold private pension products than those who could save in the past. This suggests that when people face important budget constraints, they have a limited capacity to worry about multiple issues at any one time (Linville and Fischer, 1991); short-term financial constraints can take on enhanced salience, eliciting greater engagement with some problems while leading to the neglect of others (Shah et al., 2012; Mani et al., 2013; Mullainathan and Shafir, 2013; Haushofer and Fehr, 2014), and notably resulting in a lower propensity to plan for or worry about their well-being in retirement.

While exploring the channels through which the experience of financial challenges can affect our respondents' propensity to plan for retirement or recognise future financial security as an important concern, we examine whether the effects of an inability to save are dependent on respondents' risk tolerance, their self-assessment of their current economic circumstances, and expectations about their future income. We show that the effect might partially operate through people's perceived future income prospects and

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assessment of their current financial situation.

We also evaluate the heterogeneity of effects. First, the negative effect of experiencing financial challenges on people's propensity to plan or worry for retirement could be driven by individuals' time preferences. If this were the case, we would expect the effect to be stronger for those who are more present biased. Equally, having to provide for a spouse might increase the threat posed by past financial challenges and thus increase the effect these factors might have on retirement planning. Work arrangements might also alter the extent to which past experience of financial challenges affects concerns and planning for retirement. We show that experience of financial challenges remains a key determinant of retirement planning, no matter the respondents' present bias, marital status, or work arrangements, suggesting that the estimates do not show more general differences in family and work arrangements or time preferences across respondents.

Moreover, we examine the sensitivity of our results to alternative measures of financial challenges. We also control for the adequacy of the country pension system. This analysis mitigates the possibility that our findings are driven by the overall robustness of the social security systems, which might directly influence the extent to which people are affected by periods in which they were unable to save.

2 Related literature

This paper is part of a growing literature which focuses on understanding the factors that can either inhibit or encourage effective financial planning for retirement. Multiple studies indicate an association between retirement savings and gender, with men being more likely to plan and save for retirement than women (Agnew et al., 2003; Lusardi and Mitchell, 2007, 2008, 2011). Age and the duration of an individual's job tenure are also positively associated with retirement planning (Clark et al., 2009; Agnew et al., 2008; Hershey et al., 2010), suggesting that younger individuals just stepping onto the career ladder are less likely to think about their future financial well-being. Income is also a key determinant, with higher earners more inclined to plan for their financial

well-being in retirement. Financially knowledgeable and educated individuals are also much more likely to have thought about retirement and plan for it (Lusardi and Mitchell, 2011; Brown and Weisbenner, 2014). Family structure and marital status (Szinovacz et al., 2001; Clark and Strauss, 2008; Chatterjee and Zahirovic-Herbert, 2010) also affect positively people's propensity to plan for and be concerned about their financial security in retirement. More recently, studies have shown that numerous systematic, and often predictable, behavioural tendencies, such as present bias, procrastination, and adherence to the status quo, can act as barriers to individuals saving for retirement (Thaler and Benartzi, 2004; Venti, 2006; Benartzi and Thaler, 2007).

We contribute to this literature by providing an analysis of the effect of having too few financial resources, i.e. lower savings, on individuals' propensity to plan for the future or recognise retirement as their major financial concern. Previous studies have shown that financial challenges affect people's subjective well-being and mental health (Shafir, 2017). However, with the exception of de Bruijn and Antonides (2020), few studies have systematically explored the relationship between people's inability to save and their preoccupation with their financial future, or with their propensity to plan for it. After including a large battery of controls that previous studies have identified as determinants of retirement planning and concerns, we show that people who could not save in the past 12 months are less likely to consider well-being in retirement as their major financial concern or plan for their retirement years, a task that "is left for some hopefully easier future time" (Shafir, 2017, p.133). One can afford to pay attention to asset building and long-term welfare only when short-term needs can be met, or are so well understood that they can be managed.

More generally, we complement the growing literature on the effects of life experience on belief formation, and the adoption of self-protective behaviour. People base their concerns about the future on their current feelings combined with past experience (Loewenstein et al., 2003). Past experience affects individuals' mental imagery, which in turn affects cognitive evaluations and anticipatory emotions - that is, future visceral and affective reactions to risk and uncertainty (Loewenstein et al., 2001; Slovic et al., 2002;

Marx et al., 2007). In the economics literature, these findings have been used to explain the adoption of precautionary measures in a wide variety of areas. It has been shown that having experienced substantial damage to one's property due to a flood, hurricane, or earthquake increases people's interest in purchasing an insurance policy against these risks (Kunreuther, 1996). Equally, experience informs people's intentions to purchase safety devices and insurance policies which could prevent theft and thus the risk of financial losses (Yechiam et al., 2006; Maguire, 1980). In the domain of health, it has been shown that people who have suffered from ill health in the past worry more about their health, update their beliefs concerning the prevalence of that illness and its seriousness, and ultimately revise their behaviour accordingly. Innocenti et al. (2019) also shows that people who have personally experienced a negative health event that temporarily prevented them from earning an income are 25% more likely to state an intention to purchase income protection insurance than those who have not had such an experience.

While controlling for most factors that previous studies have identified as key determinants of retirement planning decisions, our paper contributes to this literature by focusing on the relationship between people's ability to save part of their income over the last 12 months and their propensity to recognise well-being in retirement as their major financial concern and plan for it. We conduct robustness exercises and explore possible underlining mechanisms. Additionally, unlike some studies that use data from just one country or a handful of advanced Western economies (Lusardi and Mitchell, 2014), our data reaches beyond the US, the UK, and Western Europe to Australasia and Latin America. Like Gruber and Wise (1999) and others, we anticipated that there would be variations in our empirical findings by country given persistent and significant institutional differences in social security and welfare systems around the world. Yet we provide a consistent set of results across the 16 jurisdictions, enriching our understanding of retirement concerns and planning around the world and making a key contribution to the literature.

The remainder of the paper is structured as follows. Section 3 describes the data and our main measurements. Section 4 describes our empirical strategy and key results. We explore possible mechanisms in section 5, followed by robustness checks in section 6 and

the heterogeneity analysis in section 7. Section 8 synthesises our results and implications for future research.

3   Data

3.1   Data source

Our analysis relies upon a large international survey implemented between February and March 2019. The data was collected as part of a multi-country study for Zurich Insurance Group, a large multi-national insurer. The countries included in the survey were Finland, Germany, Ireland, Italy, Spain, Switzerland, and the UK (Europe); Brazil, Mexico, and the US (the Americas); Australia, Hong Kong, Japan, and Malaysia (Asia); and the United Arab Emirates (UAE). In each country, the survey sample was selected to be representative in terms of age, gender, and sub-national region. In all but one country (UAE), the numbers of respondents who completed the survey ranged from 900 through to 1,600 people, matching other cross-country studies including Dohmen et al. (2010); Innocenti et al. (2019).

The survey was implemented by a private research firm which has experience with consumer panels and the collation of survey data across multiple jurisdictions and in different languages.[1] The providers' panel management practices were compliant with jurisdiction-specific data protection and privacy laws. Only respondents who completed the survey received rewards. These rewards depended on the panel providers' customary compensation schemes and included points programmes, gift cards, vouchers, charitable contributions, and prize draws.

Respondents were asked to provide detailed information about several aspects of their work lives and financial circumstances, including their work contract, their perceptions of job security and the changes in their financial situations, and their health history.

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[1]The survey was administered online and took respondents 27 minutes on average to complete. The exact formulation of all questions used in this paper is provided in the supplementary material (See Appendix B). Where necessary, the survey instrument was translated from English into the main language or languages of the target country. The translation process entailed various integrity checks, including translation from the target languages back into English followed by a side-by-side comparison with the original English version.

Their cognitive skills and attitudes towards risk were also tested. Socio-demographic data was also collected at the individual and household level. Our survey includes 18,019 observations across 16 countries.

3.2 Retirement concerns and planning: measurement and descriptives

Our main dependent variables identify whether individuals are mostly concerned about or plan for their financial security in retirement.

First, we measure people's concern about their future financial security in retirement by asking respondents to report on their major financial concerns. Respondents were given the opportunity to choose between the following options: paying monthly bills; having enough money for a comfortable retirement; burdening their family and friends if they were to die prematurely; paying off/reducing credit card debts; other.[2] We construct a binary indicator that takes the value 1 if the respondent has identified their financial well-being in retirement as their major financial concern and zero if they are mostly concerned about other financial matters. In what follows, we interpret this binary variable as capturing the respondents' "concerns for retirement" or their "worry for retirement".

In our sample, 43% of workers recognise financial security in retirement as their primary financial concern. We note that there is some heterogeneity in the extent to which people are concerned about their retirement financial well-being across the countries in our dataset. Figure 1 documents the rankings of financial concerns across countries. The answer option "having enough money for a comfortable retirement" was ranked as the number one concern in 14 of the 16 countries under scrutiny, the exceptions being Brazil and Romania. In Japan and Germany, financial security during retirement was more im-

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[2]A similar question has been used in other settings, notably in a large survey by the OECD (2019). Respondents were first asked to identify the top three short-term (i.e. over the next year or two) financial risks to themselves or their immediate family. They could choose among becoming ill or disabled; struggling to meet all expenses; crime or violence; losing a job; accessing childcare or education; adequate housing; and accessing long-term care. Similarly, respondents were asked to select their top three greatest long-term concerns from among the following: not attaining status; financial security in old age; ensuring long-term care of family members; and adequate housing. Our framing combines short- and long-term issues and allows the respondent to trade off between them. Additionally, our focus is on personal finance, so contextual or health risks are omitted.

portant than all other answer options combined and was about equal to all other options combined in Finland, Hong Kong, and Italy.

[Figure 1 about here.]

Second, we measure the extent to which people are planning for retirement by asking respondents to answer a binary question indicating whether they own private pension products that are meant to increase financial security in retirement. We asked respondents "Do you personally hold a personal pension product i.e. long-term savings product that helps you save extra for your pension? This private insurance supplements pensions provided by the state or your workplace." We take positive answers to this question as an indication of the respondents greater propensity to plan for retirement. Hereafter, we refer to this variable as "planning for retirement" in this paper. Our dataset contains this information for all countries, expect for Australia, where the data provider did not collect this information.[3] As a consequence, for this question, our sample counts 16,912 observations.

In our sample which excludes Australian respondents, 29% of workers own private insurance products to supplement their retirement income. However, contributions to private pension funds vary across jurisdictions. As can be seen in Figure 2, the uptake of these financial products appear to be highest in Ireland, where 44% of respondents own a private pension product, and lowest in Finland (14%). This heterogeneity is possibly due to tax regimes and other country-specific institutions which incentivise or discourage the acquisition of these financial products.

[Figure 2 about here.]

We pool together survey participants across all countries to identify which individual characteristics are correlated with retirement concerns and plans. We present this

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[3]Private pension insurance products are sold in all the 15 markets part of our database, albeit under quite different regulatory and administrative arrangements. In Australia, workplace pension saving is compulsory and subject to federal government regulation as regards minimum contribution rates and the costs associated with standardised products. The profit-for-member superannuation funds that dominate the sector do not offer pension insurance products and, as a consequence, the market for these types of products is very small and concentrated among high income groups.

information in Table 3. Respondents who worry about their retirement or own a private pension product are on average older than individuals who do not have one, and they are significantly less likely to be engaged in atypical work. We define an atypical work arrangement as any employment contract other than full-time, permanent employment. A similar definition has been adopted by Eurofound (2017) and used in recent work on atypical work arrangements - see for example Datta et al. (2019). Further, those who identify financial security in retirement as their major concern or plan for it are on average more educated and have higher monthly earnings. Interestingly, on an unconditional basis, individuals who identify financial security in retirement as their major concern or plan for it display higher cognitive skills. In line with previous literature which showed that men have a stronger tendency to purchase pension savings-related investment products than women (Agnew et al., 2008), in our sample those who worry about and plan for their retirement are significantly more likely to be men. This is also in line with (Lusardi and Mitchell, 2008), who show that the majority of women undertake no retirement planning.

3.3 Experience of financial challenges: measurement and descriptives

As mentioned, our main independent variable is the 'experience of financial challenges', which we measure by asking respondents to report whether or not they were able to save part of their income in the 12-month period before the survey was administered. In what follows, we interpret negative answers to this binary question as capturing respondents' "experience of financial challenges" or as an indication of whether they "have lived through financial hardship over the last 12 months".

Around 39% of people in our sample were not able to save part of their income in 2018. As can be seen from Figure 3, on an unconditional basis, women, less educated, older workers and those earning lower incomes are significantly less likely to have been able to save part of their income in the year prior to the survey.

[Figure 3 about here.]

4 Empirical strategy and results

4.1 Empirical specification

Our basic logit specification is presented in Equation 1.

$$Pr(Y_{i,c} = 1) = \Lambda(\alpha_0 + \alpha_1 FC_{i,c} + \alpha_3 \mathbf{X}_{i,c} + u_c + e_{i,c}) \tag{1}$$

where $Y_{i,c}$, our binary dependent variable, indicates either whether a respondent declared that her financial well-being in retirement represents her major financial concern or not, or whether she plans for retirement by contributing to a supplementary pension fund. i indicates the respondent, c her country of residence. The term u_c stands for country fixed effects to control for jurisdictional factors that could drive differences in retirement concerns and planning. Since we specify a logit model to represent choice behaviour, $\Lambda(\cdot)$ refers to the cumulative distribution function of the logistic distribution.

As noted above, $FC_{i,c}$ stands for the key regressors of our analysis. As mentioned above, we measure experience of financial challenges by means of a dummy variable indicating whether the respondent was able to save part of her income or not during the year prior to the survey.

The variable $\mathbf{X}_{i,c,j}$ identifies a vector of controls, i.e. a set of individual and employment characteristics. We assume that whether people identify retirement as their major financial concern and plan for it depends on the demographic and economic characteristics of the respondent, including gender, education, individual income, age, and a binary variable for the presence of children in the family. We also include a dummy to identify whether the respondent has an atypical work arrangement or a 'standard' full-time open-ended employment contract. Additionally, we consider people's level of financial literacy, which in the past has been identified as a key predictor of deliberative decision-making and financial behaviour (Lusardi and Mitchell, 2007; Alessie et al., 2011; Lusardi and Mitchell, 2014). Although our survey does not contain a test of financial knowledge, we use the Cognitive Reflection Test (CRT) (Frederick, 2005) as a proxy. In fact, cognitive abilities, as measured by this test, have been found to be highly correlated with financial

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literacy (Skagerlund et al., 2018; Muñoz-Murillo et al., 2020) and mathematical abilities (Campitelli and Gerrans, 2014). We include in our regressions the number of correct answers individuals were able to provide to the three questions which the CRT comprises.

Two potential identification issues arise when carrying out this analysis. First, the extent to which individuals are concerned about their well-being in retirement depends on the institutional measures in place to offset the negative effects of financial challenges. This can *a priori* shape their inclination to take action to augment their retirement income or simply be concerned about it. We address this issue by including country fixed effects in all our model specifications. Additionally, in a robustness check, we also explore whether the adequacy of the pension system alters the association between our variables of interest (see section 6.2).

A second issue to consider regards omitted variables. Our main regressor records whether individuals were able to save part of their income during the 12 months prior to the survey. Yet we have no measure of the amount of savings. Equally, we have no information as to whether respondents own a house or have accumulated other forms of equity that might help with their retirement well-being and thus reduce people's propensity to worry about their financial security in retirement or propensity to plan for it. We acknowledge that previous literature has shown that assets are generally considered tools to reduce exposure to risk and shield oneself against shocks (Deaton et al., 1992; Lusardi et al., 2011). Although we have no means to alleviate these concerns directly, we always control for income in our specifications. Additionally, in section 5, we use the interaction between the experience of financial challenges and broad income levels as a proxy for wealth and examine whether the effect of past experience of financial challenges on retirement concerns or planning changes along the income distribution. We also explore whether perceptions of one's current financial situation mediate the effect that financial challenges exert on retirement concerns and planning.

For these reasons, although we control for a large number of observables, we cannot make causal claims about the effect of financial challenges on people's propensity to identify financial security in retirement as their major financial concern and their propensity

to plan for their retirement years.

4.2 Results

We report our main results in Table 1. In panel A, our dependent variable is a dummy indicating whether people have identified financial well-being in retirement as their major financial concern. In panel B, we consider whether respondents own a private pension product or not as the dependent variable. All estimates display the log-odds resulting from pooled logit regression models with country fixed effects and standard errors clustered at the country level to account for country heterogeneity.

[Table 1 about here.]

Table 1 shows that having been unable to save income over the past 12-month period is inversely related to individuals' propensity to worry and plan for retirement, conditional on individual and employment characteristics. In particular, Panel A shows that, all else being equal, an individual who could not save part of her income is less likely to consider retirement as her major financial concern compared to someone who accumulated savings in the year prior to the survey. Panel B confirms that financial challenges are at least one factor that discourages the acquisition of private pension products. Individuals who could not save any of their income in the year prior to the survey are significantly less likely to own private pension products compared to those who were able to accumulate some savings.

Additionally, Table 1 shows that educational attainment increases the estimated probability of being concerned about retirement. However, it does not exert a significant effect on people's decision to purchase private pension products. Table 1 also confirms that, all else being equal, people with higher cognitive abilities are also more likely to identify financial security in retirement as their major financial concern. This finding is in line with previous behavioural studies which uncovered a positive correlation between cognitive capacities and the handling of scarce financial resources (Mullainathan and Shafir, 2013; Mani et al., 2013; Shah et al., 2012). Working arrangements also seem to play a

significant role. Although it could be argued that those in atypical contracts are more concerned about their future well-being, given that they often have lower social security entitlements, Table 1 shows that, conditional on all other socio-economic characteristics, atypical workers are less likely to be concerned about and plan for their retirement than those who have more stable working arrangements. Overall, older individuals are more likely to be concerned about their well-being in retirement than their younger counterparts, a finding which confirms that retirement becomes salient as one grows older.

5   Potential mechanisms

There are several ways to rationalise the effect of people's inability to save and their concerns and propensity to plan for retirement. We test two behavioural mechanisms: risk tolerance and expectations about future income. In line with previous studies (Adams-Prassl et al., 2020; Pei et al., 2019), we perform a coefficient comparison test and check whether our estimates are insensitive to the inclusion of these factors in our model. We also explore the role of a more direct mechanism by exploring whether people's assessment of their current financial situation mediates the effect of financial challenges on their propensity to plan for retirement or to be concerned by it. We also explore the role of wealth holdings, which might attenuate the effect of one's inability to save for 12 months on concerns and planning.

Risk aversion: The first mechanism stems from risk aversion. Multiple studies in the economics literature have shown that people's willingness to take risks lessens significantly as a result of negative experience such as natural disasters, wars and economic crises (Malmendier and Nagel, 2011; Cassar et al., 2017; Callen et al., 2014; Cameron and Shah, 2015; Kim and Lee, 2014; Bernile et al., 2017), or individual-specific negative life events (Bucciol and Zarri, 2015). Equally, having experienced financial hardship lowers people's risk tolerance through stress and negative affective states (Haushofer and Fehr, 2014). In the context of our study, this might in turn affect people's propensity to plan for or be concerned about their future financial well-being.

To elicit an individual's degree of risk aversion, the survey adapted the experimentally validated method elaborated by Charness and Gneezy (2010) and Charness and Villeval (2009). This consisted of a simple investment task where each participant was asked how much of a hypothetical equivalent of $100 of savings they would want to invest in a risky asset that paid 2.5 times the amount invested with 50 percent probability, and zero otherwise. The lower the amount invested in the risky asset, the higher the degree of risk aversion. Conversely, risk-tolerant or risk-neutral individuals will invest the whole $100. We construct a variable that captures the difference between 100 and the amount the individual would be willing to invest. The variable ranges from 0 to 100, with 100 indicating the highest degree of risk aversion.[4] We include this measure on the right-hand side of our main model specification.

Table 2 shows our results. At first glance, the estimated effect of past financial challenges does not appear to move when risk tolerance is considered. Following Pei et al. (2019), below the estimates in Column 2 we display the p-values comparing each of the estimated effect of past financial challenges to the one from Column 1 where risk tolerance is not accounted for. The results confirm that risk tolerance does not mediate the negative relationship linking financial challenges and people's propensity to plan for or be concerned about their financial well-being in retirement.

Future income prospects: The second mechanism stems from people's uncertainty regarding their future income. Experience of financial challenges could skew expectations about economic prospects. Specifically, due to some form of negativity bias (Baumeister et al., 2001), people could project their financial experience into their future economic prospects. Since the literature has established a link between income expectations and planning for retirement (Thaler and Benartzi, 2004), it may be that part of the negative effect linking people's inability to save and their concerns and plans for retirement operates through future income prospects.

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[4]Crosetto and Filippin (2013) compare various risk elicitation tasks. They show that in the laboratory conditions the investment game elaborated by Charness and Gneezy (2010) and Charness and Villeval (2009) yields estimated degrees of risk aversion which are similar to that obtained by means of a Bomb Risk Elicitation Task (Crosetto and Filippin, 2013), a multiple price list as in Holt and Laury (2005), or an ordered lottery choice as implemented by Eckel and Grossman (2002, 2008).

We investigate this possible channel by controlling for people's expectations of future income in our model specification. We measure income expectations through a survey question which asked respondents whether they believe their financial situation is going to deteriorate, remain stable, or improve in the 12 months following the survey. We construct a variable that takes value 1 if the respondent expects a positive improvement in their financial circumstances and zero otherwise.

Column 3 in Table 2 shows that when expectations of future income are included in the model, the coefficient linking financial challenges and people's concerns and propensity to plan for retirement marginally reduces in size. The coefficient comparison test presented in Column 3 indicates that expectations of future income attenuate the estimated effect of past financial challenges in Panel A, but not in Panel B. This suggests that the effect that past financial challenges exert on retirement concerns is mediated by future income prospects. In particular, the negative effect that financial challenges exerts on retirement concerns is lessened if people expect their income to increase in the next 12 months.

Current financial perceptions: A more direct mechanism might also be at work. People's propensity to plan for retirement or simply to be concerned about it could be directly affected by perceptions that their current financial situation has not ameliorated compared to the past. Equally, people's saving abilities might cause a change in their perceptions about their current financial situation. In fact, being able to save can intrinsically bias personal assessments of one's current financial situation.

We investigate this direct channel by including in our model a measure of perceived changes in one's current financial situation. We asked respondents to declare whether they believe that their financial situation has changed over the last year (compared to the previous 12 months). Answer options were given on a 5-point Likert scale ranging from 1 "It got a lot worse" to 5 "It improved a lot". We construct a binary indicator that takes value 1 if the respondent reckons that her finances improved considerably or mildly, and 0 otherwise.

Column 4 in Table 2 shows that when a binary variable depicting whether one's current financial situation has improved or not is included in the model, the negative effect that

financial challenges exerts on both retirement concerns and planning drops significantly. This is confirmed by the coefficient comparison test presented at the bottom of the table. It suggests the effect that episodes of financial challenges exert on people's propensity to plan for or be concerned about retirement is stronger when the perceived deterioration in their finances extends into the present.

It can also be argued that concerns for retirement are the *conditio sine qua non* for individuals to purchase a pension product. This would suggest that both an inability to save and concerns about retirement security could affect individuals' decisions to contribute to a pension plan either positively or negatively. To explore the relative importance these two opposing factors, we run a simple logit regression with an interaction term to estimate the joint effect of retirement concerns and financial challenges on planning. The coefficients of the interaction term yield interesting insights, summarised graphically in Fig. 4. The effect of retirement concerns on planning is significant if and only if the agent was able to save in the 12-month period prior to the survey. Differently, concerns for retirement exert no significant effect on people's decision to purchase retirement products if individuals could not save part of their income. People who could save and are worried about their well-being in retirement are *ceteris paribus* significantly more likely to think about investing in pension products compared to those who could not save and are not worried about well-being in retirement, with the predicted probability increasing from 0.20 in baseline to 0.33. [5]

[Table 2 about here.]

[Figure 4 about here.]

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[5]To assess the importance of other explanatory channels, as an additional check, we interacted our binary indicator of financial challenges and a dummy variable indicating whether respondents are mainly concerned about paying their monthly bills. The marginal effects of the interaction term presented in figure 6 in the Appendix indicate that conditional on being unable to save, people's propensity to plan for retirement does not differ significantly depending on whether they are concerned about making ends meet or not. Conversely, provided respondents could save, being concerned about paying monthly bills significantly (at 90%) reduces the predicted probability of contributing to pension private funds compared to instances in which one is not worried about making ends meet. Similar results are obtained when interacting financial challenges with people's concerns related to burdening family and friends if they were to die prematurely.

Wealth holdings: An alternative mechanism to explain the observed relationship could reside in the fact that people with lower wealth holdings are also more likely to be exposed to episodes of financial challenges. Assets are in fact generally considered tools to reduce exposure to risk and shield oneself against shocks (Deaton et al., 1992). Clark et al. (2010, 2012) showed that, in some countries, some individuals, typically young and with relatively low income, rely heavily upon investment in the property market for their future retirement incomes. Lusardi and Mitchell (2007) found the existence of a strong positive association between retirement planning and wealth.

In all our model specifications we control for income, as our dataset does not contain information on respondents' equity. However, to explore this mechanism further, we interact our main regressor with broad income categories calculated on the basis of each country's income distribution. In doing so, we implicitly assume that wealth holdings are directly proportional to one's income.

Figure 5 plots the predicted probability of retirement planning or concerns for the six possible combinations of income as a proxy for wealth and financial challenges. The results show that the effect of financial challenges varies along the income distribution. However, the predicted probability that people identify retirement as their major financial concern or plan for it is significantly lower if people could not save, no matter their wealth holdings. For instance, as shown in Figure 5a, high-income people who could not save are significantly less likely to be concerned about retirement than low-income household who could save part of their income.

[Figure 5 about here.]

6 Robustness

Our results are robust to using a different definition of experience of financial challenges based on past episodes of a shortfall in earned income due to ill health which prevented our respondents from working. In addition, we show that our results remain unchanged when we control for the specific characteristics of the pension system of the countries

scrutinised in the study.

6.1 Alternative measures of financial challenges

In our main specifications we have focused on the inability to save as the main manifestation of financial challenges. In this section, we assess whether defining the experience of financial challenges as the result of negative health events undermines our results. While people's ability to save conceals some discretionary spending, episodes of ill health are largely beyond workers' control. This definition allows us to explore whether an exogenous experience of financial challenges can still exert an effect on individuals' propensity to plan for retirement or see future financial security as their major concern. In the survey, respondents were asked whether or not they had suffered from ill health which prevented them from working in the past. We use this binary indicator as an alternative measure of past experience of financial challenges.

We re-estimate our main model using the same set of controls but employing this alternative measure to proxy experience financial hardship over the past 12 months. We obtain similar results in terms of sign and statistical significance (See Table 4). The effect size changes slightly, with negative health events exerting a smaller effect on retirement concerns and no effect on planning.[6] However, this evidence corroborates our finding that experience of financial challenges is a particularly important predictor of people's concerns for retirement and ability to plan for it, even beyond their capacity to save.

6.2 Institutional arrangements and country level regressions

We included country fixed effects in all our models to remove the impact on retirement concerns and planning of fixed country characteristics, which are potentially correlated with financial challenges. Yet these country dummies run the risk of absorbing differences in institutional contexts. The perceived adequacy of retirement income systems might well affect individuals' inclination to plan for retirement or to be concerned by it.

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[6]It should be noted that a slight change in size effect is not surprising as the correlation between people's inability to save and negative health episodes is low (Pearson corr=0.05). Additionally, in our sample only 6,640 individuals suffered from ill health.

Therefore, as an additional check of the robustness of our result, we use the 2019 Melbourne Mercer Global Pension Index to control for country-specific characteristics of the pension system of the countries scrutinised. This index provides a comprehensive measure of pension welfare, taking into account national social security systems, private or employer-sponsored pension benefits, and other related institutions. The index attributes an overall score to each country which is the weighted sum of scores measuring the adequacy, sustainability, and integrity of pension systems found in three sub-indices. The index, which was retrieved from Mercer (2019), is only available for 14 out of our 16 countries; Romania and the UAE are not included in the analysis.

The results are presented in Table 5. Column 1 controls for the three sub-indices which make up the Mercer Global Pension Index. Finally, in columns 2 and 3 we split the sample depending on whether individuals reside in a country whose overall score on the index is above (i.e. Australia, Germany, Hong Kong, Ireland, Switzerland, Finland and the UK) or below or equal to (i.e. Brazil, Italy, Japan, Malaysia, Mexico, Spain and the US) the median sample value. This allows us to verify whether the effect of financial challenges on retirement varies depending on the overall pension system performance. Table 5 shows that the effect of financial challenges on people's propensity to plan for retirement or to recognise future financial security as a concern remains relatively stable even after controlling for the differences in retirement income schemes across countries.

We also ran country-level regressions to identify any further country heterogeneity. We report the coefficient of our main measure of the experience of financial challenges on retirement concerns and planning for each country in our sample in Figure 7. All regressions include the full battery of controls. No matter their country of residence, respondents who were unable to save part of their income are significantly less likely to recognise their well-being in retirement as a concern (See Figure 7a). Similarly, lacking savings significantly reduces the probability of holding private pension products. This effect is significant at the 5 percent level for most countries in our sample (See Figure 7b).

7 Heterogeneity in effects

In this section we explore possible heterogeneity. In particular, we wish to ascertain that the effect that past financial challenges exerts on people's concerns and plans for retirement is not guided by individual differences in time preferences, family, or work characteristics.

Impatience. Eisenhauer and Ventura (2006) established a significant relationship between present-biased preferences and a dichotomous variable for whether or not the person has contributed to a pension. According to the psychology of poverty literature, households with a smaller budget are faced with more difficult trade-offs, which in turn affect their willpower and time-discounting behaviour (Haushofer and Fehr, 2014; Carvalho et al., 2016). Thus, the negative effect of experience of financial hardship over the last 12 months on retirement concerns or planning could be driven by individuals' time preferences. If this was the case, we would expect the effect to be stronger for those who are more present biased. To shed light on this, we examine the heterogeneous effects of financial challenges and time preferences. In line with numerous studies (Lusardi et al., 2010; Scharff and Viscusi, 2011; Benjamin et al., 2006), we use smoking as a proxy for present preferences and self-control limitations.[7] In Table 6 (Column 1 and 2) we show that the overall effect is not driven by individuals who are impatient and thus have strong preferences for the present.

Family circumstances. Marital status has been found to play an important role in retirement income adequacy (Bajtelsmit, 2006). Even and Turner (1999) show that the pension coverage rate for two-person households is greater than that for singles of either gender. Equally, however, having to provide for a spouse or a partner might increase the threat posed by past financial challenges and thus increase the effect these factors might have on retirement concerns and planning. In Table 6 (Columns 3 and 4) we test whether experience of financial challenges exerts a differentiated effect depending on whether individuals are married or cohabiting, or single or widowed. We show that

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[7] Previous research has shown that impatience is associated with higher rates of smoking. Smokers tend to discount uncertain future monetary outcomes more often than non-smokers (Bickel et al., 1999; Lejuez et al., 2002).

an inability to save does not exert a stronger effect on retirement concerns or planning for those individuals who are married or cohabiting, and might have to provide for their spouse or partner, compared to those who are single or widowed.

Work arrangements. On the one hand, pension systems suffer from an intrinsic inertia and do not account for occupational labour mobility (Engelen, 2006). At the same time, recent changes in the world of work have seen a growing share of the workforce employed in atypical working arrangements and thus enjoying fewer pension benefits. These two concurrent phenomena suggest that the effect that financial challenges exerts on people's concerns and planning for retirement could vary with their employment status, with atypical workers being more exposed to financial challenges and possibly also more likely to identify well-being in retirement as their major financial concern and to have a supplementary private pension. In Table 6 (Columns 5 and 6), atypical workers are less likely to worry about and plan for retirement than full-time employees. Yet, financial challenges generate a symmetric and quite comparable decline in the predicted probability to acquire private pension products for both groups of workers.

8 Conclusion and discussion

The accumulated effects of population ageing, low economic growth, and more recently reduced financial returns have accentuated the problems of paying for workers' retirement in many countries. Thus, now more than ever before, workers are faced with the need to plan for their retirement. At the same time, many households, even in developed countries, are living on the financial edge and are increasingly less able to handle financial shocks.

Using an original survey based upon representative samples of working individuals in 16 countries, we show that individuals who were not able to save part of their income over the last 12-month period are less likely to consider well-being in retirement as their major financial concern. They are also less likely to contribute to private pension funds to replenish their retirement income than those who could accumulate savings. Put differently, episodes of financial turmoil exert a negative effect on people's propensity to identify financial security in retirement as their major financial concern and act in the interest of their long-term well-being. We provide evidence that this effect is stable across countries. Additionally, we show that the importance of financial challenges does not vary significantly with work arrangements, family circumstances, or time preferences.

Taken together, these findings demonstrate a feedback loop in which the experience of financial challenges can become engrained and may then lead to lower levels of concern and a greater tendency not to plan for retirement. This feedback loop may prolong a state of distress and undermine the prospects of achieving financial security in retirement. If this feedback loop holds true, efforts to help households to weather financial turbulence should be key to ensuring their long-term financial well-being. When saving shortfalls loom large, an individual's future financial well-being is not salient to them. This might seriously undermine people's efforts and ability to accumulate assets, putting the retirement system under strain in turn. In these circumstances, establishing minimum income levels could be beneficial to counteract the psychological distress that resource scarcity brings about (Haushofer and Fehr, 2014). A second possibility for breaking the cycle and improving welfare consists of targeting retirement planning directly. In this respect, small nudges,

such as commitment saving accounts, reminders, or opt-out mechanisms might stabilise contributions and produce tangible benefits. These strategies are not mutually exclusive. They should be considered in isolation as well as in combination to properly assess their long-run effect.

Our analysis is robust to using alternative measures of financial challenges and controlling for differences in countries' pension systems. However, future research might wish to eliminate the bias in our estimates that is plausibly generated by omitted variables. In particular, collecting information on the amount of savings and possibly equity holdings for each respondent appears to be a promising way to advance our analysis. Additionally, longitudinal studies might be well suited to evaluating whether financial challenges alter people's propensity to think about and plan for retirement in a sustainable manner or whether the effect fades away with an amelioration of workers' financial situations. Equally, in our set-up, perceived income prospects, together with assessments of one's financial situation, appear to at least partially mediate the effect that financial challenges exert on retirement concerns. However, to properly assess the potential of these mechanisms, future studies might wish to collect data on income expectations before and after the experience of financial challenges. This would be key to assessing whether the effect of financial hardship over the last 12-month period on retirement planning and concerns acts through a decline in income expectations.

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Appendix A Supplementary material

[Table 3 about here.]

[Figure 6 about here.]

[Table 4 about here.]

[Table 5 about here.]

[Figure 7 about here.]

[Table 6 about here.]

Appendix B   Online Supplementary material - Survey questions

In this section, we provide the exact formulation of the survey questions used in this study. Questions are presented in the same order as seen by survey participants

Demographics

What is your gender? [Male, Female]

What is your age (in years)?

What is your income (gross)?

Retirement Concerns

Which of the following would you say is your biggest financial concern? [Paying monthly bills; Having enough money for a comfortable retirement; Burdening my family and friends if I die prematurely; Paying off/reducing credit card debts; Other: please specify.]

Retirement planning

Do you personally hold a personal pension product i.e. a long-term saving product that helps you save extra for your pension. This complements pensions provided by the state or your workplace.[No/Yes; Prefer not to say]

Experience of Financial challenges

Were you able to save part of your income in 2018?[No/Yes]

Work situation

How would you describe your current employment? [I am employed (i.e., work for an organisation or company that is not my own), I am self-employed (e.g., have my own

business, am a freelancer, work-on-demand), Both of the above]

Which type of employment contract do you have for your (main) job? [I have a contract ... for a fixed amount of time: for less than 3 months, for a fixed amount of time: for more than 3 months, a permanent contract (i.e., of unlimited duration), for an apprenticeship (or other training contract), I do not have any contract]

Cognitive reflection test

A bat and a ball cost $11.00 in total. The bat costs $10.00 more than the ball. How much does the ball cost?

If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake?

Risk preferences

Imagine that you have a $100 of savings. You have the opportunity to invest in a risky financial product with the following features: There is a chance of 1 in 2 (50%) that the investment is profitable; If the investment is profitable, you earn 2.5 times the amount that you have invested; If the investment is not profitable, you lose the amount that you have invested. How much of your saved $100 would you like to invest in this product?

Other individual characteristics

Do you have any children? [No/Yes]

Do you currently smoke? [No/Yes]

Which of the following best describes your current situation? [Married/in a civil partner-

ship; Cohabiting as part of a couple (not shown in UEA); Divorced; Separated; Widowed; Single]

How many years of schooling have you completed in your life?

How do you expect your financial situation to develop over the next 12 months (compared to your current situation)? [It will get a lot worse; a little worse; it will stay the same; it will improve a bit; a lot; I don't know]

Figure 1: Ranking of financial concerns by country
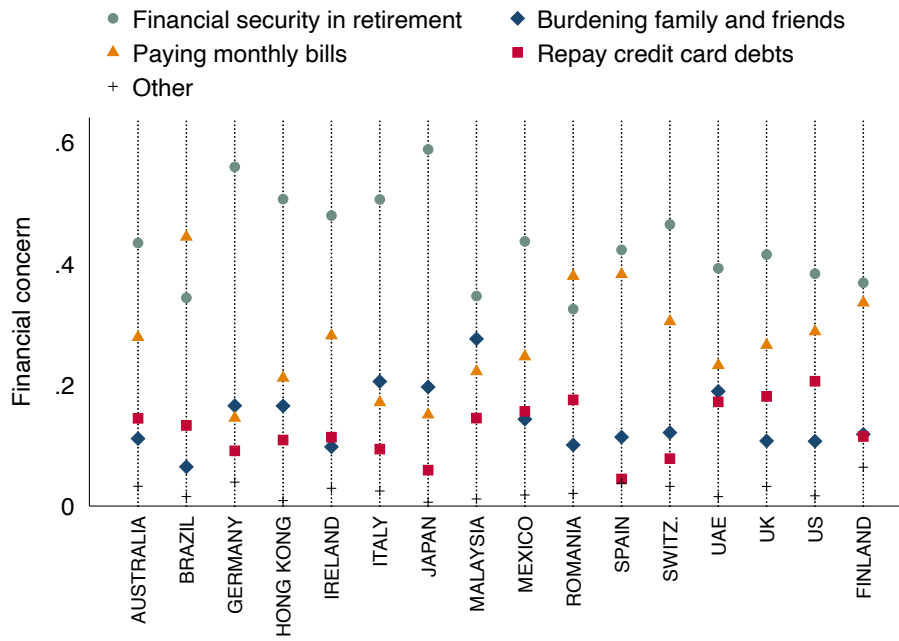
Notes: Fraction of respondents who are concerned about their financial security in retirement (grey circles), being a burden to their family or friends (blue diamonds), paying monthly bills (orange triangles), repaying credit card debts (red squares) and other concerns (black +), for each country in our sample.

Figure 2: Share of respondents who own private pension products by country
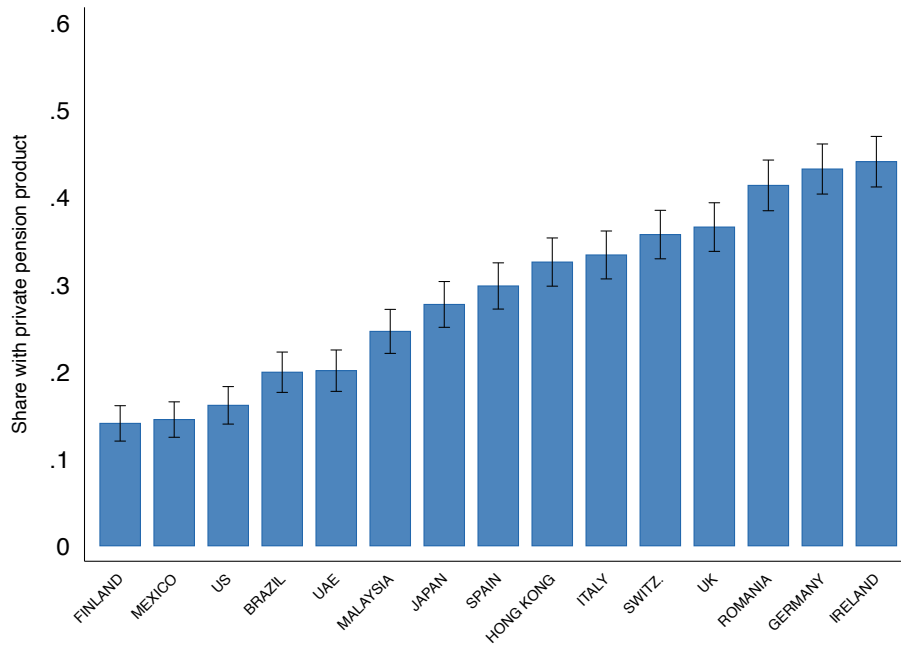
Notes: Fraction of respondents who own a private pension product, for each country in our sample.

Figure 3: Experience of financial challenges by individual characteristics
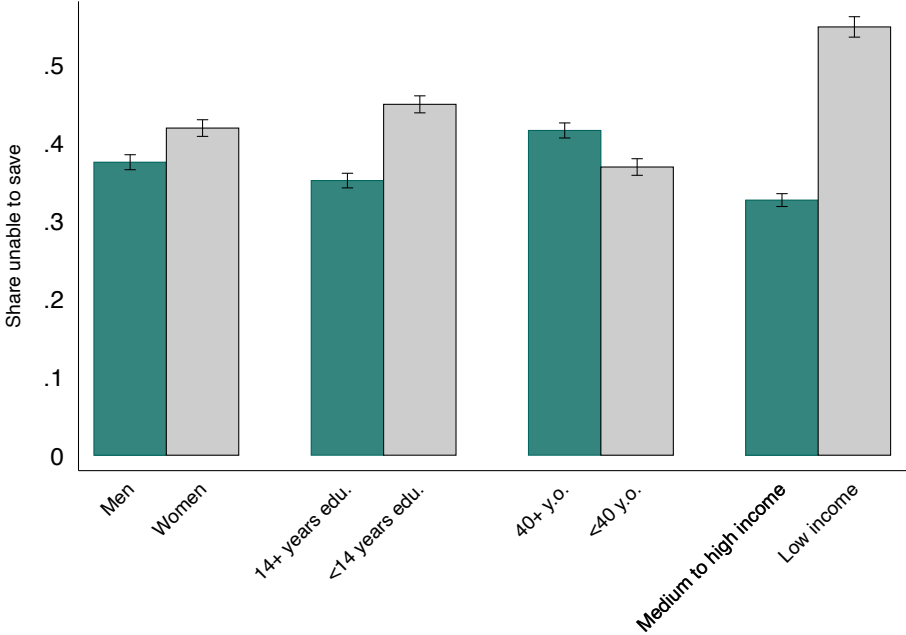
Notes: Fraction of respondents who experienced financial challenges in the 12-month period prior to the survey by individual characteristics.

Figure 4: Predicted probability of holding a private pension product by concern for retirement
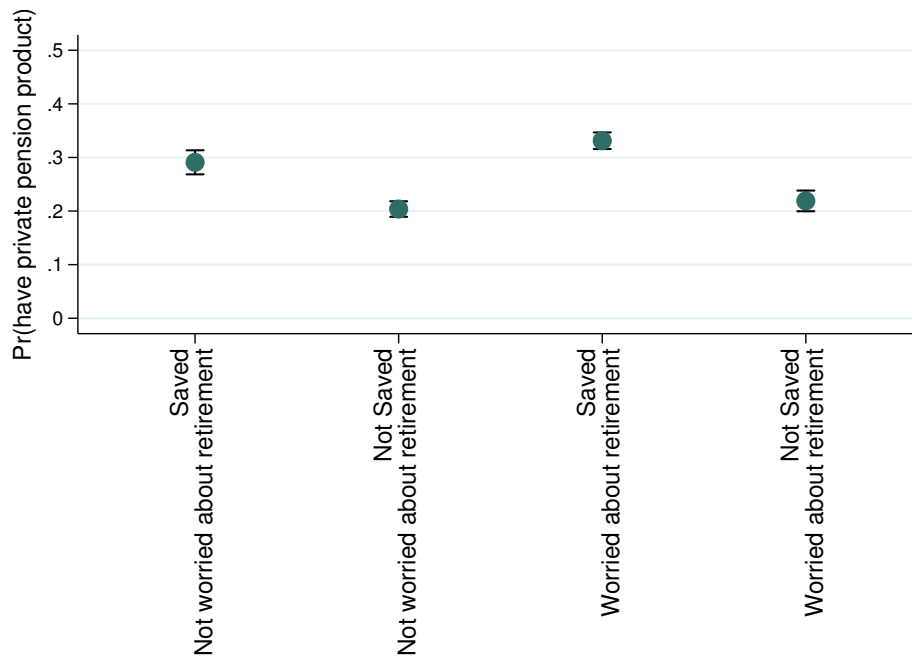
Notes: Predicted probability of holding a private pension product for the four possible combinations of retirement concerns and saving. The dots represent marginal effects from the interaction variable, and the bars show 95% confidence intervals. All regressions include the full set of controls.

Figure 5: Predicted probability retirement planning and concerns by broad income categories
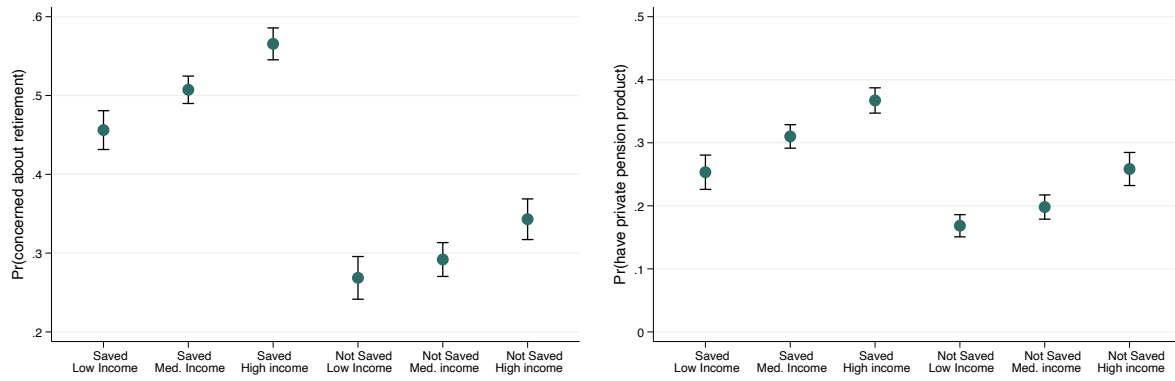
(a) Retirement concerns

(b) Retirement planning

Notes: Predicted probability of worry for retirement (panel a) or planning for it (panel b) for the six possible combinations of wealth holdings and financial challenges. The dots represent marginal effects from the interaction variable, and the bars show 95% confidence intervals. All regressions include the full set of controls.

Figure 6: Predicted probability of holding a private pension product by concern for retirement
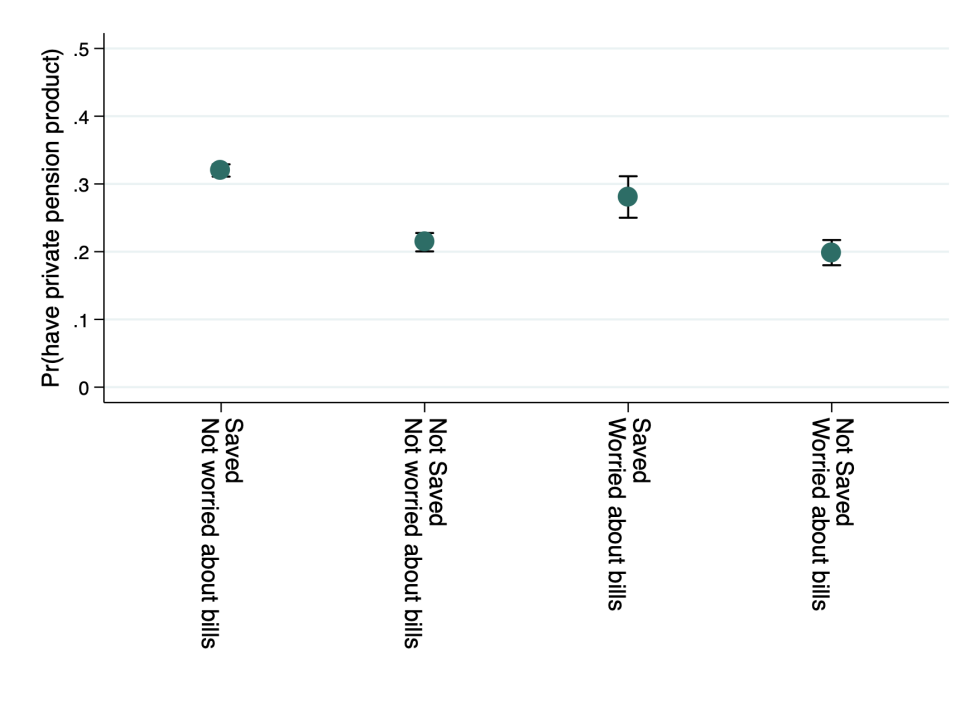
Notes: Predicted probability of holding a private pension product for the four possible combinations of concerns about paying monthly bills and saving. The dots represent marginal effects from the interaction variable, and the bars show 95% confidence intervals. All regressions include the full set of controls.

Figure 7: Effect of financial vulnerability on retirement concerns and planning in 16 countries
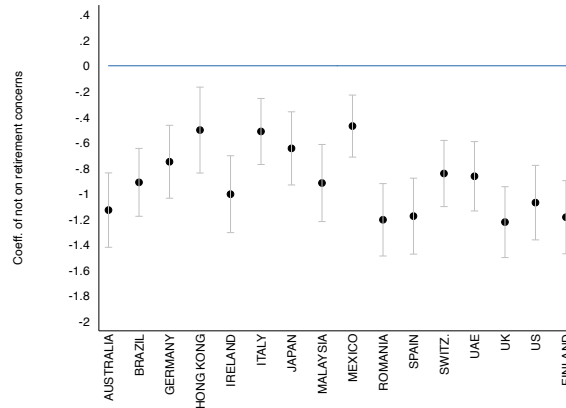
(a) Retirement as major financial concern
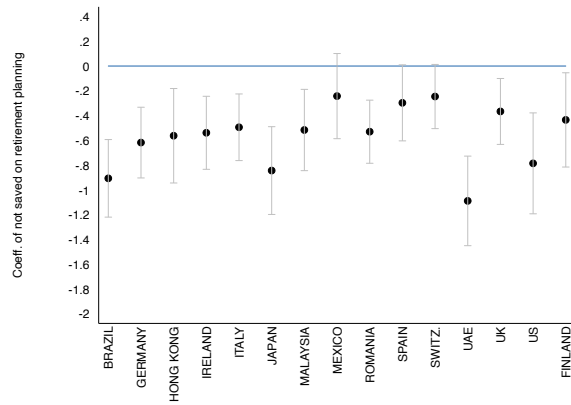
(b) Have private pension product

Notes: For each country, we regress a binary indicator indicating whether respondents identify retirement as their major concern (Panel A) or own a private pension product (Panel B) on our measure of experience of financial challenge and the full set of controls described above. We plot the resulting coefficients in log-odds metrics as well as their 95 percent confidence intervals in Panel A and B respectively. Negative coefficients imply that the experience of financial challenges decreases the likelihood of being worried about or planning for retirement.

Table 1: Financial challenges, concerns for retirement and ownership of private pension product

Panel A: Retirement as major financial concern			
	(1)	(2)	(3)
Not saved	-0.921***	-0.898***	-0.885***
	(0.078)	(0.071)	(0.069)
Atypical work arrangement	-0.122*	-0.074*	-0.091**
	(0.068)	(0.042)	(0.042)
Age		0.034***	0.039***
		(0.003)	(0.003)
Male		-0.098*	-0.098*
		(0.053)	(0.053)
Education (years)		0.006**	0.006*
		(0.003)	(0.003)
Cognitive reflection score		0.115***	0.110***
		(0.020)	(0.019)
Medium income		0.131***	0.165***
		(0.046)	(0.049)
High income		0.352***	0.403***
		(0.068)	(0.069)
Children			-0.306***
			(0.062)
Married or cohabiting			-0.016
			(0.028)
Constant	0.136**	-1.672***	-1.697***
	(0.061)	(0.143)	(0.139)
Observations	18019	18019	18019
Pseudo R^2	0.04	0.08	0.09
BIC	23824	22727	22670
Country F.E.	yes	yes	yes
Panel B: Have private pension product			
	(1)	(2)	(3)
Not saved	-0.641***	-0.532***	-0.541***
	(0.089)	(0.062)	(0.061)
Atypical work arrangement	-0.512***	-0.327***	-0.314***
	(0.094)	(0.062)	(0.060)
Age		0.012**	0.010
		(0.006)	(0.006)
Male		0.114***	0.111**
		(0.044)	(0.045)
Education (years)		0.003	0.003
		(0.003)	(0.003)
Cognitive reflection score		-0.001	0.002
		(0.018)	(0.018)
Medium income		0.283***	0.250***
		(0.066)	(0.073)
High income		0.582***	0.532***
		(0.069)	(0.078)
Children			0.149***
			(0.049)
Married or cohabiting			0.093
			(0.069)
Constant	-0.479***	-1.968***	-1.974***
	(0.123)	(0.298)	(0.290)
Observations	16912	16912	16912
Pseudo R^2	0.03	0.08	0.08
BIC	19816	18879	18873
Country F.E.	yes	yes	yes

Notes: Panel A shows results for logit regressions where the dependent variable is a binary indicator for whether respondents identify retirement as their major concern. Panel B shows the same sets of results for regressions where the dependent variable is a binary indicator identifying whether the respondents have a private pension insurance product. Coefficients of logit regressions expressed in log-odds metrics. All regressions include controls for age, gender, having children, education (in years), Cognitive reflection test score, indicators for having a medium or high income and binary variables for having an atypical work arrangement and being married or cohabiting. Standard errors clustered at the country level.
* p<0.1, ** p<0.05, *** p<0.01.

Table 2: Potential mechanisms: risk aversion, future income prospects and current financial perceptions

	(1)	(2)	(3)	(4)	(5)
Panel A: Retirement as major financial concern					
Not saved	-0.885***	-0.885***	-0.874***	-0.857***	-0.853***
	(0.069)	(0.069)	(0.070)	(0.070)	(0.071)
Risk aversion - Continuous		-0.000			0.000
		(0.001)			(0.001)
Positive Econ. Prospects			0.115***		0.061
			(0.037)		(0.040)
Positive current Econ. situation				0.164***	0.133***
				(0.035)	(0.040)
Coefficient comparison test (p-val)		0.803	0.043	0.000	0.001
Observations	18019	18019	17192	18019	17192
Pseudo R^2	0.09	0.09	0.08	0.09	0.08
BIC	22670	22679	21701	22657	21708
Country F.E.	yes	yes	yes	yes	yes
Panel B: Have private pension product					
	(1)	(2)	(3)	(4)	(5)
Not saved	-0.541***	-0.537***	-0.550***	-0.519***	-0.539***
	(0.061)	(0.062)	(0.061)	(0.059)	(0.059)
Risk aversion - Continuous		-0.004***			-0.004***
		(0.001)			(0.001)
Positive Econ. Prospects			0.141***		0.103*
			(0.048)		(0.059)
Neg. current Econ. situation				0.124***	0.054
				(0.035)	(0.047)
Coefficient comparison test (p-val)		0.055	0.200	0.000	0.416
Observations	16912	16912	16126	16912	16126
Pseudo R^2	0.08	0.08	0.08	0.08	0.08
BIC	18873	18839	18187	18872	18170
Country F.E.	yes	yes	yes	yes	yes

Notes: Panel A shows results for logit regressions where the dependent variable is a binary indicator for whether respondents identify retirement as their major concern. Panel B shows the same sets of results for regressions where the dependent variable is a binary indicator identifying whether the respondents have a private pension insurance product. Coefficients of logit regressions expressed in log-odds metrics. All regressions include controls for age, gender, having children, education (in years), Cognitive reflection test score, indicators for having a medium or high income and binary variables for having an atypical work arrangement and being married or cohabiting. Standard errors clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01.

Table 3: Descriptive statistics by whether or not respondents identify retirement as their major financial concern and whether they own a private pension product

	Retirement as major financial concern			Have private pension product		
	Yes	No	Diff	Yes	No	Diff
Female	0.45	0.47	-0.02***	0.42	0.47	-0.05***
	[0.50]	[0.50]	(0.01)	[0.49]	[0.50]	(0.01)
Age	44.57	39.96	4.61***	43.53	41.35	2.17***
	[11.93]	[11.54]	(0.18)	[11.39]	[12.03]	(0.20)
Children	0.57	0.57	0.00***	0.62	0.55	0.07***
	[0.49]	[0.49]	(0.01)	[0.49]	[0.50]	(0.01)
Atypical work arrangement	0.38	0.42	-0.04***	0.31	0.43	-0.13***
	[0.49]	[0.49]	(0.01)	[0.46]	[0.50]	(0.01)
Married or cohabiting	0.67	0.64	0.03***	0.72	0.62	0.10***
	[0.47]	[0.48]	(0.01)	[0.45]	[0.48]	(0.01)
Education (years)	14.10	13.51	0.58***	14.14	13.59	0.55***
	[4.82]	[5.02]	(0.07)	[4.87]	[5.03]	(0.08)
Not saved	0.27	0.49	-0.21***	0.29	0.44	-0.15***
	[0.45]	[0.50]	(0.01)	[0.45]	[0.50]	(0.01)
Risk aversion - Continuous	59.73	58.19	1.54***	57.58	59.55	-1.97***
	[30.58]	[29.85]	(0.45)	[30.20]	[30.00]	(0.51)
Cognitive reflection score	0.88	0.69	0.19***	0.87	0.74	0.13***
	[1.03]	[0.94]	(0.01)	[1.03]	[0.97]	(0.02)
Smoker	0.21	0.25	-0.05	0.23	0.23	0.01
	[0.40]	[0.43]	(0.01)	[0.42]	[0.42]	(0.01)
Observations	7845	10174		4888	12024	

Notes: Descriptive statistics by whether or not respondents consider well-being in retirement as their major financial concern (Columns 1-3) and by whether or not they have a private pension product (Columns 4-6). Columns 1, 2, 4 and 5 report the mean and standard deviation for the relevant group; Columns 3 and 6 report the difference in means across groups, and significance stars for a test of equality of means across groups. Standard deviations in square brackets and standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table 4: Alternative measure of financial challenges

	Retirement as major financial concern	Have private pension product
	(1)	(2)
Neg. past health	-0.167***	0.067
	(0.054)	(0.043)
Atypical work arrangement	-0.137***	-0.340***
	(0.041)	(0.059)
Age	0.037***	0.009
	(0.003)	(0.006)
Male	-0.072	0.124***
	(0.051)	(0.045)
Education (years)	0.009***	0.006*
	(0.003)	(0.003)
Cognitive reflection score	0.116***	0.008
	(0.019)	(0.018)
Medium income	0.276***	0.320***
	(0.052)	(0.074)
High income	0.607***	0.669***
	(0.074)	(0.082)
Children	-0.355***	0.110**
	(0.061)	(0.048)
Married or cohabiting	0.006	0.108
	(0.029)	(0.068)
Constant	-1.964***	-2.356***
	(0.151)	(0.273)
Observations	18019	16912
Pseudo R^2	0.06	0.07
BIC	23302	19058
Country F.E.	yes	yes

Notes: Columns 1 shows results for logit regressions where the dependent variable is a binary indicator for whether respondents identify retirement as their major concern. Columns 2 shows the same sets of results for regressions where the dependent variable is a binary indicator identifying whether the respondents have a private pension product. Financial challenges are here either measured using a dummy variable which indicates whether the individual has suffered from ill health in the past (Neg. past health). Coefficients of logit regressions expressed in log-odds metrics. All regressions include controls for age, gender, having children, education (in years), Cognitive reflection score, indicators for having a medium or high income and binary variables for having an atypical work arrangement and being married or cohabiting. Standard errors clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01.

Table 5: Exploring differences in retirement income systems

Panel A: Retirement as major financial concern

	All	MGP index ≤ median	MPG index > median
	(1)	(2)	(3)
Not saved	-0.863***	-0.786***	-0.947***
	(0.076)	(0.103)	(0.099)
Adequacy	-0.028***		
	(0.001)		
Integrity	0.009***		
	(0.001)		
Sustainability	0.020***		
	(0.001)		
Observations	15821	7929	7892
Pseudo R^2	0.09	0.08	0.09
BIC	19986	10034	9930
Country F.E.	yes	yes	yes
Controls	yes	yes	yes

Panel B: Have private pension product

	All	MGP index ≤ median	MPG index > median
	(1)	(2)	(3)
Not saved	-0.509***	-0.558***	-0.458***
	(0.061)	(0.105)	(0.063)
Adequacy	-0.102***		
	(0.001)		
Integrity	0.033***		
	(0.001)		
Sustainability	-0.034***		
	(0.001)		
Observations	14714	7929	6785
Pseudo R^2	0.08	0.06	0.07
BIC	16355	8214	8144
Country F.E.	yes	yes	yes
Controls	yes	yes	yes

Notes: Panel A shows results for logit regressions where the dependent variable is a binary indicator for whether respondents identify retirement as their major financial concern. Panel B shows the same sets of results for regressions where the dependent variable is a binary indicator identifying whether the respondents have a private pension insurance product. Columns 2 and 3 report regression results for countries with MGP index below and above median respectively. Coefficients of logit regressions expressed in log-odds metrics. All regressions include controls for age, gender, having children, education (in years), Cognitive reflection score, indicators for having a medium or high income and binary variables for having an atypical work arrangement and being married or cohabiting. Standard errors clustered at the country level. * p<0.1, ** p<0.05, *** p<0.01.

Table 6: Heterogeneous effects

	Impatient (1)	Not impatient (2)	Married or Cohabiting (3)	Single or Widow (4)	Atypical work arrangement (5)	Typical work arrangement (6)
Panel A: Retirement as major financial concern						
Not saved	-0.934***	-0.856***	-0.886***	-0.885***	-0.792***	-0.951***
	(0.104)	(0.065)	(0.063)	(0.089)	(0.074)	(0.097)
Observations	4171	13848	11697	6322	7280	10739
Pseudo R^2	0.10	0.08	0.09	0.08	0.08	0.09
BIC	5101	17600	14769	7930	9184	13520
Country F.E.	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes
Panel B: Have private pension product						
	Impatient (1)	Not impatient (2)	Married or Cohabiting (3)	Single or Widow (4)	Atypical work arrangement (5)	Typical work arrangement (6)
Not saved	-0.505***	-0.560***	-0.551***	-0.510***	-0.580***	-0.523***
	(0.078)	(0.064)	(0.064)	(0.074)	(0.079)	(0.065)
Observations	3911	13001	10998	5914	6673	10239
Pseudo R^2	0.08	0.08	0.07	0.08	0.07	0.07
BIC	4430	14480	12869	6007	6685	12212
Country F.E.	yes	yes	yes	yes	yes	yes
Controls	yes	yes	yes	yes	yes	yes

Notes: Panel A shows results for logit regressions where the dependent variable is a binary indicator for whether respondents identify retirement as their major concern. Panel B shows the same sets of results for regressions where the dependent variable is a binary indicator identifying whether the respondents have a private pension product. We split the sample on the basis of impatience, family circumstances and work arrangements. Coefficients of logit regressions expressed in log-odds metrics. All regressions include controls for age, gender, having children, education (in years), Cognitive reflection score, and indicators for having a medium or high income. Standard errors clustered at the country level. * $p<0.1$, ** $p<0.05$, *** $p<0.01$.