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Henriette Prast and Arthur van Soest*

Financial Literacy and Preparation for Retirement

Many countries have started reforming their pension systems in the past few decades. To meet the challenges of an ageing population, and more recently due to the economic and financial crisis, standard eligibility ages for state pensions have increased, generous early retirement arrangements have been abolished, occupational pensions have become less generous, and a substantial part of the risk and responsibility for an adequate standard of living after retirement has been shifted from the government, employers and pension funds to individuals and private households.¹ In the US, for example, employer-provided “defined benefit” plans guaranteeing a given income after retirement have largely been replaced by “defined contribution” plans, where premiums are fixed but pension income depends on investment returns and individuals have to make their own investment choices.² In Italy the public pension system has also been reformed towards a defined contribution system, and individuals are encouraged to supplement their retirement savings with voluntary savings in a pension fund.³ Similarly, the generosity of the public pension system in Germany has been reduced, and individuals are encouraged to invest voluntarily in tax-advantaged pensions. Still, it is their own responsibility to do so and also to choose from numerous investment possibilities.⁴ More choice also becomes more common at a later stage of the life cycle. In the Netherlands, flexible retirement opportunities now exist for early,

late or gradual retirement, with actuarially neutral trade-offs between more leisure and more income over the life cycle. In addition, after retirement, it will become possible to withdraw a portion of mandatory occupational pension savings as a lump sum instead of an annuity.⁵ Other important pension-related choices for which individuals themselves are now more often responsible than in the past concern investment decisions after retirement (with a higher expected return and more risk than the fixed annuity) and covering the longevity risk of their partner.

As a natural consequence, policy makers have become more concerned with whether individuals are able to make the pension-related decisions that are in their own best interest, in the sense of maximising their expected utility over the life cycle, and (if necessary) how they can be helped to achieve this goal. This paper aims at summarising the relevant insights on this topic. The first important aspect is financial literacy. An active literature has shown that the majority of people have problems answering simple questions on compound interest, inflation and risk diversification. This majority also tends to be less active in planning for retirement.

In the next section, we discuss the effectiveness of policies aimed at increasing financial literacy and the role of financial literacy for pension-related decisions. We then discuss communication policies aimed at improving pension knowledge, which is a much more specific concept than financial literacy, as well as pension awareness and involvement with pension issues. The literature also clearly demonstrates that improving financial literacy and pension knowledge alone is far from sufficient. Thus, before concluding, we also consider the large potential of choice architecture as a complementary way to improve decisions on pension preparation, i.e. how the design and presentation of choices can push people in the right direction, without limiting the choices that they have.

Financial literacy

Recent studies have measured financial literacy in a comparable way in surveys representing the adult populations of a large number of countries, using the three simple

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1 OECD: Pensions at a Glance 2013: OECD and G20 Indicators, OECD, Paris 2013.

2 A. Lusardi, O. Mitchell: Financial literacy and retirement planning in the United States, in: *Journal of Pension Economics and Finance*, Vol. 10, No. 4, 2011, pp. 509-525.

3 E. Fornero, C. Monticone: Financial literacy and pension plan participation in Italy, in: *Journal of Pension Economics and Finance*, Vol. 10, No. 4, 2011, pp. 547-564.

4 T. Bucher-Koenen, A. Lusardi: Financial literacy and retirement planning in Germany, in: *Journal of Pension Economics and Finance*, Vol. 10, No. 4, 2011, pp. 565-584.

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5 Eerste Kamer der Staten-Generaal: Initiatiefvoorstel-Lodders Wet verbeterde premieregeling, https://www.eerstekamer.nl/wetsvoorstel/34255_initiatiefvoorstel_lodders.

Box 1

The financial literacy questions of Lusardi and Mitchell**Compounding of interest rates**

Suppose you had \$100 in a savings account and the interest rate was two per cent per year. After five years, how much do you think you would have in the account if you left the money to grow: More than \$102, exactly \$102 or less than \$102?

Inflation

Imagine the interest rate on your savings account was one per cent per year and inflation was two per cent per year. After one year, would you be able to buy more than, exactly the same as or less than today?

Knowledge about stocks and stock mutual funds and risk diversification

Do you think the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund."

questions reproduced in Box 1.⁶ The first question measures whether people understand the basic principle of a compound interest rate, the second is about inflation, and the third is about the principle of risk diversification, requiring some knowledge of financial market products. An overview of the results in 12 countries shows that the percentage of respondents that answered all three questions correctly varied from less than four per cent (Russia, Romania) to more than 53% (Germany).⁷ The lowest percentages of correct answers were often found for the risk diversification question, but many individuals could also not provide correct answers to the first question (e.g. only 35.2% in Sweden) or the second question (31.8% in Romania). Substantial differences in the numbers of correct answers also exist across socio-economic groups, generally indicating that women are less financially literate than men, that the oldest and youngest age groups have lower financial literacy than the middle-aged, and that, as expected, financial literacy increases with the level of education.

6 See the excellent overview A. Lusardi, O. Mitchell: The economic importance of financial literacy: Theory and evidence, in: *Journal of Economic Literature*, Vol. 52, No. 1, 2014, pp. 5-44.

7 Table 2 in A. Lusardi, O. Mitchell: The economic importance ..., op. cit.

Financial literacy appears to be positively associated with retirement planning, in the sense of thinking about the financial resources needed for retirement. The more interesting question is whether this association reflects a causal link from financial literacy to retirement planning. The literature has developed several methods to answer this question, exploiting panel data techniques and different instrumental variables for identification.⁸ Although the identifying assumptions are never beyond criticism,⁹ the robustness of the results suggests that better financial literacy does indeed lead to a larger probability of thinking about retirement needs. Some existing studies also show that individuals who do more retirement planning tend to accumulate more pension wealth, but the behavioural economics literature demonstrates that this link is much weaker. Intentions are a poor predictor of actual behaviour, especially in the domain of retirement preparation.¹⁰ Financial literacy also has a positive effect on other forms of actual behaviour that can improve retirement resources, such as investing in the stock market,¹¹ not borrowing against 401(k) or pension accounts,¹² avoiding consumer credit,¹³ or investing in on-the-job training.¹⁴

If financial literacy can help people make better pension-related decisions, the next question is how to improve financial literacy. The research on the effectiveness of interventions aimed at improving financial knowledge has not yet reached consensus. Initiatives to introduce mandatory financial education have been criticised, since this would come at the cost of other subjects, is expensive and the ultimate improvements in financial outcomes may be very limited.¹⁵ A meta-study of more than 200 articles

8 See e.g. A. Lusardi, O. Mitchell: Financial literacy ..., op. cit.; R. Alessie, M. van Rooij, A. Lusardi: Financial literacy, retirement preparation and pension expectations in the Netherlands, in: *Journal of Pension Economics and Finance*, Vol. 10, No. 4, 2011, pp. 527-545; and T. Bucher-Koenen, A. Lusardi, op. cit.

9 See e.g. D. Fernandes, J. Lynch, R. Netemeyer: Financial literacy, financial education and downstream financial behaviors, in: *Management Science*, Vol. 60, No. 8, 2014, pp. 1861-1883.

10 R.H. Thaler, S. Benartzi: Save More Tomorrow™: Using Behavioral Economics to Increase Employee Saving, in: *Journal of Political Economy*, Vol. 112, No. 1, 2004, pp. 164-187.

11 M. Van Rooij, A. Lusardi, R. Alessie: Financial literacy and stock market participation, in: *Journal of Financial Economics*, Vol. 101, No. 2, 2011, pp. 449-472.

12 S. Utkus, J. Young: Financial literacy and 401(k) loans, in: O. Mitchell, A. Lusardi (eds.): *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*, Oxford 2010, Oxford University Press, pp. 59-75.

13 J. Gathergood, R. Disney: Financial literacy and consumer credit portfolios, in: *Journal of Banking and Finance*, Vol. 37, No. 7, 2013, pp. 2246-2254.

14 R. Clark, R. Matsukura, N. Ogawa: Low fertility, human capital and economic growth: The importance of financial education and job retraining, in: *Demographic Research*, Vol. 29, 2013, No. 32, pp. 865-884.

15 L. Willis: The financial education fallacy, in: *American Economic Review*, Vol. 101, No. 3, 2011, pp. 429-434; D. Fernandes et al., op. cit.

even suggests that interventions aimed at improving financial literacy have hardly led to any improvement in financial decisions.¹⁶

Important insights have been obtained from recent models in which financial literacy is treated as an endogenous variable¹⁷ – individuals decide how much to invest in financial literacy, making the trade-off between the cost of investment and the expected gains in terms of higher returns from more sophisticated behaviour in financial markets. Individuals who can gain more by investing in financial literacy will invest more in it. As a consequence, in many pension systems, low-income earners – who mainly rely on the mandatory state pension – have fewer incentives to invest in financial literacy. The fact that investing in financial literacy is a choice will therefore lead to an increase in wealth inequality, even if preferences and the cost of becoming financially literate do not vary with income. Moreover, offering financial education programmes to lower income groups is not effective if these groups have too little incentive to maintain their knowledge and they allow their financial skills to deteriorate after the initial investment in the education programme. On the other hand, there will also be groups of individuals for whom an initial endowment can be enough to make further investments in financial literacy worthwhile, implying that the long-run returns to financial education can be much higher than the short-term gain. Effective financial education programmes aiming to improve long-run financial literacy must incorporate follow-up efforts to ensure that the initial investment is not lost after a few years. Simulations based upon a calibrated model with realistic parameter values suggest that such programmes, if offered to employees around age 40, could increase retirement savings by up to ten per cent.¹⁸

Pension literacy

If individuals need to make optimal decisions related to living standard after retirement, they may need specific knowledge concerning the pension system in their country or their own entitlements and the rules of their own pension arrangements. Indeed, there is evidence of a causal effect of pension knowledge on pension savings, for example in Chile, where employees are obliged to save

for their retirement but can choose their own investment fund.¹⁹

Existing studies in many countries show that pension knowledge is limited. For most individuals, pension premiums are larger than any other savings made throughout their lives; despite this, involvement in pension issues is low, individuals cannot forecast their income after retirement and they do not know how they could improve their standard of living after retirement. This also applies to countries where individuals get regular updates about their accumulated pension wealth or the annual income they can expect, such as the “orange envelope” in Sweden or the “uniform pension overview” in the Netherlands. One explanation is that most individuals simply do not read the information and are not interested in their pensions until shortly before retirement – when it is often too late to undertake action to improve things, particularly when there is mandatory retirement. Another explanation is that pensions are complex, the relevant issues are difficult to understand, and pension communication often focuses on completeness and fulfilling a legal obligation rather than on the usefulness for the decision-making individuals. International comparisons suggest that pension knowledge is greater in countries with individual (rather than collective) pension systems, where individuals themselves have greater responsibility for their pension savings,²⁰ in line with the notion that pension knowledge is endogenous and greater among those who have more to gain by investing in it. On the other hand, studies also show that whether pension communication induces individuals to get involved and change their behaviour strongly depends upon the presentation and wording of the message rather than its objective content.²¹

The limitations of rational behaviour and choice architecture

Numerous experiments in economic psychology and behavioural economics have shown convincingly that the *homo economicus* does not exist. Instead of making optimal decisions, individuals are often guided by rules of thumb and are strongly influenced by how choices are organised and presented, even though this does not affect the optimal choice. This applies, though not to the

16 D. Fernandes et al., op. cit.

17 T. Jappelli, M. Padula: Investment in financial literacy and saving decisions, in: *Journal of Banking and Finance*, Vol. 37, No. 8, 2013, pp. 2779-2792; A. Lusardi, P.-C. Michaud, O. Mitchell: Optimal financial knowledge and wealth inequality, in: *Journal of Political Economy*, forthcoming.

18 A. Lusardi, P.-C. Michaud, O. Mitchell: Using a life-cycle model to evaluate financial literacy program effectiveness, Netspar Academic Series, DP 02/2015-043, Tilburg 2015.

19 O. Landerretche, C. Martínez: Voluntary savings, financial behavior and pension finance literacy: Evidence from Chile, in: *Journal of Pension Economics and Finance*, Vol. 12, No. 3, 2013, pp. 251-297.

20 Towers Watson: Global Workforce Study 2012 Nederland: Hoe denkt werkend Nederland, 2012, <http://www.towerswatson.com/nl-NL/Insights/IC-Types/Survey-Research-Results/2012/07/Global-Workforce-Study-2012>.

21 C. Boggio, E. Fornero, H. Prast, J. Sanders: Seven ways to knit your portfolio: Is investor communication neutral? Netspar Academic Series, DP 10/2015-030, Tilburg 2014.

same extent, to financially illiterate as well as financially literate groups. It applies to many financial decisions and certainly to choices related to pensions, which involve difficult intertemporal trade-offs and uncertainty. As a consequence, financial literacy and pension knowledge are not enough to achieve the goal of adequate retirement preparation.

Several related theories explain that individuals can make decisions in different ways – consciously and rationally (“thinking slow” or “system 2 thinking” in Kahneman’s terms, or following the “central route” according to the Elaboration Likelihood Model²²), or unconsciously, intuitively, and based upon rules of thumb or another choice context that should be irrelevant (“system 1 thinking” or following the “peripheral route”). Both motivation and ability (as well as knowledge) are needed to choose the central route. Of course, in reality, these are extremes, and many decision processes will have elements of both.

Knowledge about pensions, the complexity of the provided information and the choice problem are important – even pension-literate people will only make conscious pension decisions if the choices presented to them are not overly complex. In addition, it is crucial to get people involved. For example, young people who lack the motivation to think about retirement because it is too far off will not make conscious pension decisions. Their future selves can be made more salient, however, by creating a visual picture of the individual at an older age.²³ This is an example of how to stimulate individuals’ involvement. The lesson is that a “know your customer” policy in the pension industry may require creative approaches and tools, which thus far have hardly been used in practice.

When someone takes the peripheral route, the choice is sensitive to contextual cues such as the phrasing of the information, the emphasis on specific aspects of the choice, and the way in which the choice is presented and organised. There are numerous examples showing that context has huge effects, even where it should not affect a rational decision maker maximising expected utility. Box 2 presents a few examples in the domain of saving for retirement.

Choice architecture aims at organising and presenting choices in such a way that the likelihood that individuals

make sub-optimal decisions is reduced as much as possible. In principle, choice architecture does not restrict the choice opportunities, but pushes individuals in the right direction (“soft paternalism”). Some tools to achieve this are:

- Appropriate (possibly personalised) defaults,
- Commitment devices for imposing self-control,
- Splitting up complex choices into steps,
- Making choice aspects more salient (e.g. communicating in terms of what people can and cannot afford instead of in terms of income or wealth),
- Forcing people to make an active choice (by eliminating the passive default choice).

The literature shows that choice architecture can be particularly successful in the area of pension preparation, where people have to account for the long-term consequences of their decisions, must look ahead far into the future and have no opportunities to learn from their mistakes.

An example is pension accumulation for the self-employed, who in many countries are exempted from mandatory contributions to an occupational pension. Indeed, it may be in their own interest if they do not save specifically for retirement and instead make investments in their own business, but they may also often fail to save because not saving is the passive choice. They could benefit from an alternative default, where, for example, contributions could vary with the revenues of their business.

Conclusion

The Dutch Authority for the Financial Markets (AFM), which oversees pension funds and pension communication in the Netherlands, emphasises the various steps needed for adequate retirement preparation decisions: (i) knowledge of pension rules and own entitlements must lead to (ii) insight in pension adequacy and the ways in which this can be improved if needed, and (iii) this insight must induce individuals to undertake actions and make optimal decisions.²⁴

AFM emphasises that information on future pension income is not enough. It is important that individuals learn

22 R. Petty, J. Cacioppo: The Elaboration Likelihood Model of persuasion, in: *Advances in Experimental Social Psychology*, Vol. 19, 1986, pp. 123-195.

23 H. Hershfield, D. Goldstein, W. Sharpe, J. Fox, L. Yeykelis, L. Carstensen, J. Bailenson: Increasing saving behavior through age-progressed renderings of the future self, in: *Journal of Marketing Research*, Vol. 48, Special Issue 2011, pp. S23-S37.

24 AFM: Een volgende stap naar meer pensioeninzicht: pensioeninformatie actief gebruiken, Autoriteit Financiële Markten, Amsterdam 2012.

Box 2

Examples of context effects in retirement preparation

Card and Ransom show that, keeping the net wage and total pension contribution constant, voluntary pension savings are higher when the regular contribution to a company pension is presented as an employer rather than an employee contribution.¹

Brown, Kapteyn and Mitchell show that the age at which people in the US start claiming old age social security benefits depends strongly on the way in which the rewards for delayed claiming are presented.²

Choi et al. find that after an informational meeting about retirement planning, all workers who attended announced that they would participate in the company savings plan, but only 14% really did so.³ This is because the set-up of the choice process requires that action is undertaken to participate, and people tend to (indefinitely) postpone such action.

Duflo and Saez analyse a field experiment where staff of some university departments can visit a pension information market, whereas other departments cannot.⁴ The treatment effect on savings between departments is significant. Within treated departments, however, pension savings did not differ between employees who did and did not visit the market. This could mean that the effect is due to the invitation to the seminar (making pension saving a salient issue) or could indicate a network effect – sharing the information with departmental colleagues who visited the seminar may have the same effect as attending the seminar in person.

Duflo and Saez concluded from their own research and a survey of the literature on promoting retirement savings that information only has a small effect and that network effects are important, but that behavioural instruments such as defaults have a tremendous effect.⁵

Barrett, Mosca and Whelan referred to the success of experiments in New Zealand with changing the default into automatic enrolment in a supplementary pension; not participating is possible, but requires an active opt-out decision.⁶ A similar development has recently started in the UK.

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- 1 D. Card, M. Ransom: Pension plan characteristics and framing effects in employee savings behavior, in: Review of Economics and Statistics, Vol. 93, No. 1, 2011, pp. 228-243.
 - 2 J. Brown, A. Kapteyn, O. Mitchell: Framing effects and expected Social Security claiming behavior, in: Journal of Risk and Insurance, Vol. 83, No. 1, 2016, pp. 139-162.
 - 3 J. Choi, D. Laibson, B. Madrian, A. Metrick: Defined contribution pensions: Plan rules, participant decisions, and the path of least resistance, in: J. Poterba (ed.): Tax Policy and the Economy, Vol. 16, Cambridge MA 2002, MIT Press, pp. 67-114.
 - 4 E. Duflo, E. Saez: The role of information and social interactions on retirement plan decisions: Evidence from a randomized experiment, in: Quarterly Journal of Economics, Vol. 118, No. 3, 2003, pp. 815-842.
 - 5 E. Duflo, E. Saez: Implications of pension plan features, information and social interaction for retirement saving decisions, in: O. Mitchell, S. Utkus (eds.): Pension Design and Structure: New Lessons from Behavioral Finance, Oxford 2004, Oxford University Press, pp. 137-153.
 - 6 A. Barrett, I. Mosca, B. Whelan: How well informed are pension scheme members on their future pension benefits? Evidence from Ireland, in: Journal of Aging and Social Policy, Vol. 27, No. 4, 2013, pp. 295-313.

whether this income is adequate and that they both can and will undertake action if needed. This shows that, if we consider the pension domain, financial literacy and pension knowledge are not the ultimate goal – improving financial literacy and pension knowledge are instruments for improving the quality of decisions related to retirement preparation. We have discussed the effectiveness of these instruments and compared them to direct ways of improving decisions on retirement preparation, concerning the presentation and organisation of the choices that individuals have to make.

Empirical studies have shown that financial literacy, pension knowledge and involvement with pensions are low. The majority of people do not know important aspects of

the pension system or their own pension arrangements, even where the system forces them to make their own choices and take responsibility for their retirement income. This is because it is difficult to imagine being retired, because pension-related decisions are complex and because communication with customers often relies on rational and conscious (“system 2”) information processing, ignoring the importance of context and cues. It is important for the pension industry, regulators and supervisors to take account of the mechanisms of intuitive (“system 1”) decision-making. This requires, for example, communication that is meaningful in terms of the living standard the individual would like to have rather than in terms of pension risk, investing or expected wealth.

Financial literacy has a positive effect on involvement with pensions and the quality of retirement and pension-related decisions. Financial education may help to improve financial literacy and thus to improve pension decisions. This is not straightforward, however, and may be an expensive policy with uncertain pay-off. Financial education programmes are not always effective – this depends upon content, timing and the target group's incentives to maintain or build upon the initial investment. Improving financial literacy and pension knowledge is certainly not enough to guarantee optimal pension decision making. First, regulations should prevent obviously poor choices. Examples are rules for minimum pension contributions, partner pensions, or a ban on products with excessive transaction costs and a poor risk-return trade-off. Moreo-

ver, offering well-designed saving products that account for individuals' behavioural biases can work well. An example is "Save for Tomorrow", through which individuals can commit to saving a fixed share of their earnings increase for their retirement. Since this does not affect current expenditure, many more individuals are willing to do this than to engage in immediate saving.²⁵ In addition, choice architecture must guarantee that individuals are nudged into making choices that are close to optimal by thinking carefully about how to present and organise the choice process.

²⁵ R.H. Thaler, S. Benartzi, *op. cit.*