Pension Awareness, Pension Communication, and Choice Architecture

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Management Summary

This study gives an overview of what is known about pension awareness in the Netherlands and other countries. We focus on pension knowledge as well as on how pension knowledge affects pension related decisions and we discuss implications for public policy, pension communication, and choice architecture for pension related choices.

Our analysis first of all shows that pension awareness is often identified with and measured as pension knowledge – knowledge of certain aspects of the individuals’ own pension arrangement, knowledge of ways in which the own pension can be influenced, or knowledge of characteristics of the pension system. A popular measure in the Netherlands is the “pension awareness index” (PAI), measuring insight in the pension levels accumulated already and expected to be accumulated in the future, the adequacy of the own pension, and the possibilities to change this if necessary. The PAI is partly based upon self-reported information on what survey respondents think they know.

The PAI measured in 2009-2011 shows that Dutch pension knowledge is low, in spite of the general introduction of a uniform pension overview (UPO) in 2008, aimed at improving pension communication. The Netherlands is no exception in this respect: In other countries consumers’ knowledge of their own pension arrangements and the level of accumulated pension rights or the expected pension benefit is poor. This is a concern among policy makers and several countries have attempted to change it, using information and communication tools. Moreover, pension knowledge is largest among those who probably need it least, such as high-income groups or older workers close to (often mandatory) retirement who have little or no opportunities to improve their pensions.

Pension awareness is not the final goal of public policy. Policy makers usually not only see pension information and communication as tools to increase consumer knowledge but also to make consumers realize that actions are needed. The final goal is that consumers take the necessary measures to bring their pension entitlements in line with their needs and preferences. The tools to achieve this are financial education and offering information on pension entitlements, such as the Dutch UPO, its Swedish equivalent (the orange envelope), or
more sophisticated tools like the Dutch Pension Register, a web-based instrument where consumers can get insight in their total future pension income from several sources. Financial literacy and, more specifically, pension literacy are often seen as complementary to pension communication. Both are necessary in order to achieve the goal of improving the consumers’ pension related decisions. There are many studies on the effect of general financial or specific pension knowledge on financial and pension savings related behaviour. For a variety of countries, a causal effect is found on pension and retirement planning (that is, thinking about retirement). Most studies also find a positive effect of financial education on financial literacy. On the other hand, the literature suggests that the size of these effects is limited and that financial education and pension knowledge are not sufficient to guarantee that people optimally prepare for retirement. There are two major reasons for this:

- The complicated and inter-temporal nature of the pension domain implies that even well informed individuals often make choices that are not in their own interest. Procrastination, default choices, anchoring effects, etc., play a more important role in pension related decisions than in many other decisions.

- Optimal preparation for retirement is so complicated that financial education does not help much.

Accordingly, we conclude that policy makers expect too much from information campaigns or financial education programs. The literature also shows, however, that there are more effective ways of improving retirement preparation:

i) Choice architecture: offering products and choices in a way that makes it easier for consumers to transform intentions into appropriate actions and decisions, without restricting choice opportunities and without reducing the consumers’ final responsibility for their own pension provisions.

ii) Information provision in terms of the impact of choices and risk on the standard of living (rather than income) after retirement. For example, explaining what kind of life people can afford with the pension they have accumulated instead of emphasizing the income gap.
In order to design effective policies, more research on consumers’ pension decision making is needed. We recommend academic research on the following topics:

- Consumer knowledge of the relevant rules of first and second pillar pensions.
- The way in which consumers who make pension related decisions account for the risk in real pensions, and the efficiency of different ways of providing them with information on these risks.
- The trade-off between providing information on pension rights such as the Dutch UPO or the Swedish orange envelope versus pre-programmed default choices aimed at guaranteeing adequate choices for those who do not make an active choice.

More research is needed on how choice architecture can optimally be combined with communication about relevant rules, pension risks, etc. in order to improve retirement preparation of those for whom it is not enough to rely on mandatory first and second pillar pensions. Although the optimal outcome may vary due to differences in the pension systems, the problem seems common to many countries. It seems useful to formulate general guidelines but also to analyse how they can lead to different implementations in each national institutional environment.
1. Introduction

Because of increasing life expectancy and population ageing, the sustainability of the pension system has been and still is on the policy agenda in many countries. Pension systems are reformed and become less generous, with an increasing standard retirement age. In the Netherlands, the age at which residents are entitled to the flat rate state pension (AOW), increases gradually from 65 years in 2013 to 67 years in 2021. At the same time, the pension funds providing fully funded supplementary occupational pensions face problems with coverage ratios and low returns to their investments, forcing them to reduce real benefit levels through incomplete indexation or even nominal pension cuts. Pension reforms in many countries including the Netherlands involve delegating more responsibility to the consumers. Mandatory pensions become less generous but more flexible, and consumers are expected to make choices that shape their pension in a way that is in their own best interest from a life-cycle perspective. Moreover, fewer people have long-term careers as employees with a mandatory occupational pension, so that more people should make their own pension investments in third pillar products in order to reach a pension level that is in accordance with the living standard during their working lives.

For most employees, pension premiums are larger than any other savings made throughout their lives. Still, during their working lives, the consumers’ involvement in pension issues and the consequences for their own future pension is often very limited and their pension knowledge is low. Many people do not have a good forecast of the pension income they will get when they reach retirement age. Many people also admit that they do not know whether their retirement income is sufficient and what they can do to prevent an inadequate standard of living after retirement.

Several countries have introduced communication tools to improve pension awareness. In the Netherlands, the Uniform Pension Overview (UPO) was introduced, which since 2008 requires occupational pension funds to provide an annual overview of accrued pension rights to all active participants. Moreover, in 2011, the Pension Register was introduced, a digital instrument that offers an overall view of all accumulated first and second pillar pension claims.
It is clear that pension awareness is also on the international policy agenda. The OECD released a report in May 2013 (OECD, 2013b) in which the importance of pension awareness for girls and women is emphasized, and the G20 endorsed this after its summit in September 2013. In many countries, the pension system is reformed and pensions to which people are automatically entitled are becoming less generous, except usually for the lowest income groups (OECD, 2013a). More and more responsibility for additional pension savings, which are often needed to maintain the same standard of living after retirement, is given to the consumers themselves, so that pension awareness becomes increasingly important. This is true in countries with very different pension systems.

This study summarizes what we know about pension awareness. How is it defined? Is it important and if so why, for whom and when? How can it be influenced by policy makers or the pension sector? The main issue addressed in this paper is whether the tools aimed at improving pension awareness have achieved their ultimate goal: better pension preparation and smaller risk of an inadequate pension. Here we want to emphasize that it is not enough to consider the average or representative consumer. There is huge heterogeneity in labour market careers and pension entitlements, with vulnerable groups such as the self-employed or women with interrupted careers due to motherhood, who often have built up a much lower occupational pension.

The paper is organised as follows. The next section focuses on the concept of pension awareness and its role in the pension system. This shows that pension awareness goes beyond pension knowledge – knowledge must be converted into making adequate plans to prepare for retirement, and plans should result in appropriate action. Pension awareness is part of a chain of policy measures that should lead to a better retirement preparation. Sections 3 and 4 give an overview of what we know about pension knowledge in Netherlands and in other countries. In Section 5, the effectiveness of financial education is discussed as a means of promoting financial and pension knowledge. Section 6 summarizes the empirical literature on the effects of pension knowledge on retirement planning and retirement related decisions. Section 7 discusses the possible barriers that according to the psychology and behavioural economics

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may play a role. Section 8 discusses implications for policy and the final section draws some conclusions.

2. Pension awareness: definition and purpose

An important report on the Dutch pension reform (SER Pension Commission, 2008) implicitly defines pension awareness as conscious knowledge about any pension deficit and the effects of changes in the personal situation or the pension scheme on such a pension deficit. Examples of such changes are a modification from a final salary pension scheme to an average salary scheme, a job change, or a divorce. According to the report, pension awareness has become important because more and more schemes offer choice options to the participants. It is clear that pension awareness in the eyes of the Pension Commission is important for situations where action is necessary to prevent a pension deficit. Pension awareness is not a goal in itself, but a means to achieve an adequate pension. It should be emphasised that knowledge and awareness are not the same – passive knowledge is not enough to make people act.

In 2009, the Dutch Foundation Pension Viewer introduced the pension-awareness index (PAI; Wijzer in geldzaken, 2009) and explicitly formulated a definition of pension awareness:

"Pension awareness is the extent to which one is aware of pension income in old age, death and disability, knows if this sufficient in one’s personal situation, knows what can be done to solve potential problems, and makes a conscious trade off on this."

The PAI is measured in a survey. It not only asks individuals about their knowledge about pension income, but also checks whether the answers are plausible. On the other hand, the second component (knowing what can be done) is purely self-assessed by the individuals. Whether the respondents indeed make conscious decisions or not (and, if so, whether this results in actions) is not measured. In fact, the PAI therefore essentially covers pension knowledge and not on the intention to do something with that knowledge. The Dutch PAI does not measure knowledge of the pension system, in contrast to pension knowledge measures in
other countries, such as the Italian Central Bank’s index of Cappelletti and Guazzarotti (2010) which has questions on institutional knowledge that are relevant for the individual situation.

The PAI fits reasonably well with the notion that a good retirement system is a system that ensures an adequate standard of living in old age (Merton and Snippe, 2012). It does not take into account that a pension deficit may arise because of the risk of incomplete indexation or nominal pension cuts, probably because at the time it was developed this was not yet an issue. This also makes the PAI incomplete if in the future, more stock market risk will be transferred to the participants. In spite of these limitations, the PAI confirms that pension awareness is seen as a means to achieve an appropriate pension and not as a goal in itself. The building blocks of the meter are, after all, knowledge about the level of retirement income, a realistic estimate of the extent to which the pension is sufficient to maintain the standard of living after retirement, and knowing the opportunities to accumulate more pension.

The Dutch Authority for the Financial Markets (AFM), that oversees pension funds and pension communication, gives a similar objective of pension awareness (AFM, 2012, p. 4). It emphasizes the various steps required for making adequate pension decisions:

**Overview → Insight → Action**

AFM emphasizes that information on pension income is not enough. It is important that individuals get insight in whether this income is adequate, and undertake action if needed.

The Dutch government supports this notion of pension awareness. It has evaluated pension information and communication policies (Heuts and Klaver, 2011) and concluded that participants usually do not understand the information and improvements are needed (SZW 2012) to achieve the ultimate goal of better pension preparation. In particular, it recommends offering the participants a perspective on how to act if needed.

### 3. Pension knowledge in Netherlands

Figure 1 summarizes the main results of measuring pension awareness through the PAI in the first three years it was administered (2009, 2010 and 2011; see Wijzer in geldzaken, 2012). Four
levels of pension awareness are distinguished, from 1 ('completely unaware of their pension situation ') to 4 ('fully aware '):

1. Those who are not able to make a realistic estimate of the level of their retirement income.

2. Those who can estimate the level of their pension income but cannot judge whether it is sufficient.

3. Those who assess the level and its adequacy but do not know the possibilities to increase retirement income.

4. Those who assess the level and its adequacy and know the possibilities to increase their retirement income.

The figure shows that pension awareness is low and this has not changed over the three years, in spite of the introduction of the uniform pension overview. In recent years, pension awareness has been measured more extensively, but the results are not directly comparable with those in Figure 1 (Wijzer in geldzaken, 2014). Still, the results confirm that pension awareness has remained limited. For example, in 2013, 40 percent of the labour force reported that they have never thought about income or expenditure levels after retirement, and 44 percent has thought about both income and expenditures after retirement.

Wijzer in geldzaken (2012) emphasizes the potential role of the employer in stimulating pension awareness: among those who have been informed about their pensions by their employer, awareness is much higher than among other workers. Van Raaij et al. (2011) use the 2009 data to analyse associations with personal and job characteristics. As expected, older workers are more pension aware than younger workers, and pension awareness is positively correlated with education. Single people are more aware of their pensions than people are in a multi-person household, perhaps because in the latter case they often rely on the partner. Men turn out to be more pension aware than women, probably since men are often the main earner. This result is also in line with the observed gap between men and women in many countries in financial literacy (Lusardi and Mitchell, 2008). On the other hand, the difference could also reflect more self-confidence of men (cf. Bucher Koenen et al. 2012).
(1) Knowledge of their old age pension (accumulated amount, expected income, survivor pension, disability insurance)

(2) Knowledge whether this is sufficient in their personal situation, and, if necessary,

(3) Knowledge of what can be done about this if necessary


Van Raaij et al. (2011) find a positive association between pension awareness and (self-assessed) experience with financial products, investing in risky assets, wealth management, etc. They conclude there are several vulnerable groups of substantial size among those who are completely unaware of their pensions, including those who have a lower income than their spouses have, those with low financial wealth, and those who overestimate their pension income. Pension awareness, however, might not be the only issue here: many of these individuals may not have the means to save additionally for an adequate pension.

Prast (2007) already concluded that people know their desired standard of living after retirement, but have no idea what income is needed to achieve this. She also found large heterogeneity – pension awareness varies with age, education, income and labour market
status. A study by Montae (2012) on specific aspects of pension knowledge in early 2012 shows that more than half of Dutch people (53%) do not know what kind of retirement plan they have. Almost 75% do not know the level of their pension premium and 56% cannot estimate their (net monthly) retirement income. The group that does report an expected amount gives an average of more than 70% of current salary, which seems very optimistic given the current reforms. More than one third of the respondents have no idea what indexation means. Still, many Dutch people have adjusted their expectations compared to 2010. In 2010, for example, 40% thought that their pension income would be comfortably enough to make a living, but in 2012 this was only 22%.

Kuiper et al. (2012), using data collected in Summer 2012, study whether the Dutch people aged 25 to 65 are aware of the existence of the uniform pension overview (UPO) and the pension register, and whether they actual use these. They find that 28% is not aware of the existence of UPO, mostly low-skilled, low-income and young people, who also consider themselves as not financially knowledgeable in general. Those who are aware of the existence of UPO remarkably often say that they find it useful and clear. They also find that the pension register (the Internet tool assembling information on all first and second pillar pensions) is much less known: 52% is not aware of it, and only 21% ever consulted is, mainly older workers. Many of those who have not yet consulted it say that they have the intention to do so in the future. This confirms the difference between pension knowledge and behaviour. Knowledge can lead to the intention to take action, and that intention may be converted into action – but this does not always happen.

Finally, it might be interesting to see what employees themselves think of their (lack of) pension knowledge. De Bresser and van Soest (2015) examined the satisfaction of the Dutch with various aspects of their own pension and the Dutch pension system in general. Using panel data from 2006 until 2010 of approximately 1,100 employees of age 25 to 65 years, they analysed questions on satisfaction with the Dutch pension system, with the respondent’s own pension provision as a whole, with the expected (own) pension level, the expected (own) retirement age, and the knowledge about the own scheme. On a scale from 1 (totally dissatisfied) to 10 (completely satisfied), the average assessment of knowledge of the own
pension scheme is 5.95. This is higher than for the expected retirement income (average 5.88) and the expected retirement age (average 5.52), almost equal to the average assessment of the private pension scheme as a whole (5.97), and lower than the evaluation of the pension system in Netherlands (average 6.24). They found that satisfaction with knowledge contributes positively to the satisfaction with the private pension provision as a whole, but less than satisfaction with expected retirement income or expected retirement age. Satisfaction with knowledge of the own pension scheme is strongly associated with household income, probably because higher income groups are less worried about the level of their pension income. Age has a small positive effect and those who expect to retire before their 65th birthday are slightly more satisfied than others are.

4. Pension knowledge in other countries
The existing international literature shows that pension knowledge is low in many countries. Most studies concern the US, starting with Leigh (1981) and Mitchell (1988). Leigh (1981) studies self-assessments of employees and emphasizes the finding that trade union employees consider themselves more knowledgeable concerning pensions than others. Mitchell (1988) compares what employee reports on their pensions with employer reports. She finds that most employees know whether they have a defined benefit (DB) or a defined contribution (DC) plan, but are often poorly aware of specific aspects, such as the contributions made by their employer. More than 90% of the employers contribute to the pension, but in less than half of all cases, the employee is aware of this and even fewer employees know how the employer's contribution is determined. About 90% of the employers offer the possibility of early retirement, but only 75% of employees think that the possibility of early retirement exists. Mitchell finds that pension knowledge is relatively high among trade union members, employees in a large enterprise, with a higher wage, higher education, or longer tenure. These are also the cases where the pension is typically higher. Somewhat surprising she finds that women are more pension knowledgeable than men – a result that is typically not found in other studies.
Gustman and Steinmeier (2004) use data from the first three waves of the Health and Retirement Study (HRS 1992, 1994 and 1996), a representative sample of Americans 50 and older, and compare the respondents’ reports on their occupational and state pension to employer and Social Security Administration (SSA) records. They found that almost half of the respondents do not correctly report whether they have a DB pension, a DC pension or both. Moreover, employees slightly underestimate the value of their DB pension (the averages are $148,000 and $168,000), but substantially underestimate the value of DC pensions ($59,000 is the average according to the employees, $86,000 according to employers). The state pension is, on average, well assessed by male employees (averages of $19,000 for the employees and $19,200 according to SSA) but overestimated by female employees ($8,500 versus $ 6,900). Perhaps this is because some women count the partner allowance that household will receive if the husband has accumulated much more than the wife has.

Clark et al. (2012) analysed data collected in 2008-2009 on approximately 1500 workers of ages 50 and older in three major companies in the US. As an index for pension knowledge, they used the number of correct answers to 14 questions on the state and occupational pension rules. The average value of the index is 7.33, with large variation across socio-economic groups similar to those found by Mitchell (1988): older and high-skilled workers, those with high earnings and those closest to their expected retirement age have larger pension knowledge than their counterparts. They found no significant difference between men and women. In the US, there is no mandatory retirement age. Employees therefore have more freedom to extend their working life if their pension turns out to be lower than expected. This makes the fact that workers do not know their pension level until shortly before their planned retirement date less problematic.

Chan and Stevens (2008) use data from the American HRS 1992-1998 and construct measures for the rewards for later retirement and for total pension assets, which together determine the financial incentive to retire earlier or later. Their subjective measures are based on survey answers of the respondents (and missing for about a third of the sample because many people do not know their pension amounts); the objective measures come from employers’ records. There are substantial differences between the two, with average pension
assets in the administrative data more than twice as high as according to the estimates given by the respondents. On the other hand, the average respondents’ estimate of the reward for later retirement was more than twice the average compensation based upon the administrative data.

Luchak and Gunderson (2000) analysed data from 1988 of employees in the age range 20 to 65 of a large public utility company in Canada. Nearly 52% gave correct answers to questions on various aspects of the pension scheme (default retirement age, opportunities for early retirement, etc.). Correct answers were most common among older workers, those with largest tenure at the company, people with health problems, and employees who run the greatest chance of dismissal or lose most of their pension if laid off. These groups are closest to their expected retirement. On the one hand, they have the largest interest in a good pension, but on the other hand, they cannot change much anymore - opportunities for working longer are also limited since the company has a mandatory retirement age of 65. From the fact that new employees had the least pension knowledge, they concludes that pensions are not used as a fringe benefit at the (salary) negotiations at the start of the job. Instead, pension knowledge is gradually built up until actual retirement decisions have to be taken.

Similar conclusions can be drawn from Skog (2006) who studies knowledge of the pension system in Chile based on a representative sample from 2004. Chile is a special case when it comes to the pension system (Linciano, 2000). Employees are obliged to save for their retirement, but they can choose their own investment fund. In that sense, the system combines paternalism with freedom of choice and autonomy. Skog finds that individuals become more pension aware as the actual retirement decision gets closer - and less can be done to repair inadequacies. He concludes that efforts are needed to improve pension awareness of especially workers in small businesses and low-skilled workers. Remarkably, he finds several significant differences between men and women in opposite directions: men are better informed of the pension premiums and pension benefit levels, but women know more about the conditions for receiving the pension (such as the minimum eligibility age).

The Italian system gives social security for the elderly in the form of a state pension related to the employment history. Until recently, the level determined by income in the five
years before the retirement date. Since the reform in 2014, the level is determined by premiums paid instead of working time and final pay (see, e.g., Marino, 2012). Occupational pensions are very limited and supplementary pensions are mainly third pillar private pensions. Ceccarelli and Rinaldi (2011) analysed data from 2008 of Italian private sector employees, measuring pension knowledge with three questions about the rules of the Italian state pension. Less than one third of the respondents answered all questions correctly and this hardly varied with age, education, or gender. Nevertheless, there is a significant positive association between knowledge of the public pension system and voluntary participation in a supplementary pension.

Germany traditionally has a Pay-As-You-Go system with a state pension benefit based on earnings over the life cycle. In 2001, the system was reformed and retrenched, and voluntary supplementary pensions (Riester pensions) were introduced for both employees and for the self-employed. These are heavily subsidized by the tax system. Coppola and Gasche (2011) show that many people are not well informed about the possibilities for a Riester pension: in the period 2005-2010 almost 38% of those who were entitled to a Riester pension, thought they were not entitled to it. Especially the lower income groups were poorly informed.

The United Kingdom has a complicated mixed system with a limited state pension and voluntary supplementary pensions, often offered by the employer (Oehler and Werner, 2008). According to data from 2009, 70% had hardly any idea about the expected retirement income, particularly women and young people (Clery et al., 2009). More than 70% thought pensions were so complicated that it is difficult to decide what one should do, and only 23% felt able to confidently make decisions about saving for retirement.

Ireland also has a system with several pillars, with a basic state pension. Companies can choose between offering an additional individual or company pension. Barrett et al. (2013) showed that most individuals know whether they are entitled to a supplementary pension, but a majority is unable to make a good estimate of its level. This fraction is 23 percentage points higher among unskilled workers than among managers and professionals.
Larsson et al. (2008) analysed knowledge of the pension system in Sweden, studying the influence of ‘Orange envelope’, the Swedish equivalent of the Dutch UPO.\(^3\) They concluded that pension knowledge in Sweden is poor and that the introduction of the Orange envelope in 2006 hardly changed this. The large majority knows that the Orange envelope exists and about half of the people has read it, but this has not reversed the downward trend in pension knowledge. People who read the Orange envelope know the system better, but it is doubtful whether this reflects a causal link. Sweden has reformed its system around 2000, giving individuals more own responsibility on how to invest their pension savings, with a choice among more than 450 investment funds. Cronqvist and Thaler (2004) stressed that this does not help to improve pension savings, especially since the number of options is so large.

The study of Larsson et al. also briefly summarized the effects on pension knowledge of similar resources as the Orange envelope in other countries (Finland, Germany, United Kingdom, United States, Australia, Canada, and Mexico). They concluded that in all these countries, pension knowledge is limited and further research is needed to determine whether sending the pension overview affects this knowledge. Regúlez-Castillo and Vidal-Meliá (2012) were more optimistic. Based on the existing literature, they recommend introducing a similar information tool in Spain, and suggest that this may be an effective means to increase pension knowledge. Johansen (2013) shows that information about pensions in Germany is obtained through financial experts (including the employer) as well as friends and acquaintances. They concluded that the various channels reinforce each other and recommended that the government provide more accessible specific retirement information, for example on risk and investment opportunities. This fits in well with the recent insights of AFM (2012) and Kuiper et al. (2013) on the development of a pension overview that is more targeted at the needs of the individuals.

Towers Watson (2012) concluded that the pension awareness of the Dutch is low in an international perspective. Based on their international survey of over 50,000 employees, they found that in Netherlands, 22% does not know if they build up an occupational pension,

\(^3\) Laros et al. (2010) proposed sending the UPO in a red, orange or green envelope, depending on the anticipated replacement rate.
compared to an average of 14% in Europe and 8% worldwide. Especially in countries where the pension system is individual instead of collective, pension knowledge is much larger than in Netherlands. The Dutch realise more than in other countries that they will have to work longer than they had originally thought. The survey also shows that the Dutch attach value to a guaranteed pension and are often willing to sacrifice career opportunities, bonuses or holidays for this. The report of Towers Watson does not make clear whether this is more often the case in the Netherlands than in other countries.

5. Financial education

Politicians, policy makers, regulators and the financial sector seem to find it obvious that financial education is an effective way to promote financial insight and awareness of the consumer and helps the consumer to make better financial decisions. This is evident from many statements of politicians and political parties, such as "Because of poverty problems often debts, financial education should be a cornerstone in the fight against poverty" (D66 election program 2010), or "Children who learn to cope with money at an early age are better able to make wise financial choices later in life. The NVB recommends, therefore, that financial education is an integral part of education".4

But what does the literature say about the effectiveness of financial education? A lot of research was done on the relationship between financial education, general financial (Basic) knowledge and thinking about retirement or financial behaviour. Much less was done on specific pension knowledge and retirement related planning or behaviour, particularly since pension knowledge is more difficult to measure objectively. In this section, we consider both specific pension knowledge and general financial education and knowledge.

Financial education and financial knowledge

Jump $ Start is a coalition of organizations in the US aimed at promoting the financial literacy of young people by courses at school. At the end of high school, students submit a knowledge test. Mandell (2006) finds that a compulsory subject personal finance taught for six months led

to a rise in the average test score of 2 percent, while pupils who had played a stock market game scored 3 percent higher – and they saved less. After five years, however, Mandell (2012) found that there is no difference in knowledge between students that did or did not have access to a six-month personal finance course, and that a higher knowledge test score is accompanied by more erratic financial behaviour. On the other hand, Lusardi and Mitchell (2011b) found that individuals in US states where financial education was a legally required part of the curriculum at the time they went to high school, scored better on a test of financial literacy than others.

Financial education and financial behaviour
Bernheim et al. (2001) found that adults in states where financial education in high school is mandatory are better off financially than adults in other states, but Cole and Shastry (2009) show that this only applies to the cohorts that were already out of school when the course was made mandatory. Mandell and Klein (2009) found no difference in financial behaviour between young adults that did and did not have financial education at school. Courchane and Zorn (2005) found that those who reported they benefited from a personal finance course in the past, are better in financial planning than others. On this basis, they concluded that financial education works. Willis (2008) casts doubt on this conclusion, as it may be the case that bad planners do not benefit from such a course. Moore (2003) claims that victims of a predatory mortgage are less financially literate than average, but on the other hand, victims also had a more than average knowledge of mortgages and refinancing. Bell et al. (2009) found that soldiers after a free two days course on financial education knew more but were more careless with money than before.

Braucher (2001) finds that the probability of successful debt restructuring increases when taking a debtor education course. Learning by doing seems effective to promote knowledge, since students who played a stock market game, had more financial knowledge, saved less, but also made more debts (Mandell, 2006; Willis, 2009). Schreiner and Sherraden (2007) find that people with low incomes earn one dollar with each hour of financial education, while the cost per hour per person amount three dollars.
Overall, Willis (2009) concluded from a meta-study that there is no sound scientific evidence of a positive effect of financial education on financial behaviour. Studies that claim to find a connection often demonstrate an association only. The explanation may be that education does not increase knowledge, or that increasing knowledge does not lead to a behavioural change. In contrast, a more recent study of Song (2012) found a significant and large effect of knowledge promotion on savings behaviour. He studied the effect of giving information to Chinese farmers on the return to a specific investment. The farmers who had received additional information invested 40% more than they invested others. In this case, the link between information and choice is immediate, and the decision immediately follows the information provision. The result can therefore not be extrapolated to the effect of broad financial education on financial behaviour in general.

Mandell (2012) concludes: "there is little evidence that school-based financial education has had any durable effect on increasing knowledge and self-beneficial decision making."

Referring to financial education as part of the curriculum at school, he says: "These policies should not be resumed until there is solid evidence. ... Here, we not only speak about a waste of educational resources. A tremendous amount of corporate funding is spent on questionable and redundant financial education". Lusardi and Mitchell (2013) are more optimistic, but also conclude that "Research on efforts to enhance financial literacy suggest that some interventions work well, but additional experimental work is needed to explore endogeneity and establish causality". They do not focus on the effect of education on behaviour, but on financial literacy – not the last, and not even penultimate link in the policy chain.

Fernandes et al. (2014) conclude from a meta-study that financial education may have statistically significant positive effects on financial literacy and financial behaviour, but the size of the effect on financial behaviour is small: particularly in studies that identify a causal effect, financial education only explains something like 0.1% of the total variance in financial behaviour. This makes investing in (general) financial education an expensive and inefficient way to improve financial decision-making. They argue that the timing of providing information and the way in which financial choices are presented offer much better opportunities to make individuals take financial decisions that are better in line with their own (long-term) interests.
6. Financial literacy, knowledge, awareness, planning, and pension choices

What do we know about the effect of pension and retirement information, financial literacy, and pension knowledge on pension awareness, retirement planning and actual behaviour leading to better retirement preparation? Again, many studies consider the role of financial literacy and behaviour in general but few specifically study retirement. We give examples of both.

Financial literacy and retirement planning

Lusardi and Mitchell (2011b), Alessie et al. (2011) and Bucher-Koenen and Lusardi (2011) investigated the causal relationship between financial literacy and financial planning in the United States, Netherlands and Germany. Planning is defined as the extent to which people say they think about retirement and does not refer to actual behaviour. Financial literacy is measured with three simple knowledge questions on inflation, interest rates and investment risk, and in some studies also with a more extensive test for 'Advanced financial literacy'. All studies show a positive correlation between financial literacy and financial planning: those who are financially literate also tend to think more frequently about their retirement. As the researchers themselves indicate, this does not yet imply that there is a (positive) causal effect of financial literacy on financial planning. There could be reverse causality if people who think more about pension, acquire more knowledge. Alternatively, knowledge and planning could both be determined by the same third factors – interest in financial affairs, tendency to plan, self-discipline, patience, example of the parents, cognitive abilities, etc. To determine causality, Alessie et al. (2011) use instrumental variables like the literacy of their parents and longitudinal data. Using several different identification strategies, they find a robust positive causal effect of financial literacy on financial planning (in the sense of thinking about retirement).

Others have used several different instruments to identify the causal effect. Lusardi and Mitchell (2011b) for example, used the fact that financial education in high school is mandatory in some US states but not in others, and found a strong positive effect of financial literacy on retirement planning. Bucher-Koenen and Lusardi (2011) used regional political preferences in
Germany to create an instrument: Right wing voters have more affinity with investing and therefore more financial knowledge, but it can be assumed that voting right wing has no direct effect on thinking about retirement. They concluded that there is a positive causal effect of financial knowledge on thinking about retirement. The same result is confirmed with similar analyses for various other countries such as Sweden and Japan (Lusardi and Mitchell, 2011a).

**Pension knowledge and retirement planning**

The analysis of pension knowledge in the US by Clark et al. (2012), discussed in Section 4, also showed that those who overestimate the age at which they can receive the state pension plan to retire later than others. This demonstrates the importance of pension knowledge for the intended retirement age. A follow-up study (Allen et al., 2013) confirmed this finding. Chan and Stevens (2004) constructed subjective survey measures for financial incentives to retire for a sample form the 50+ population in the US. In a longitudinal study, they found that changes in these subjective measures lead to plausible changes in the expected retirement age. In other words, the perceived rules of the pension scheme influence the intention to retire at a certain age.

**Financial literacy and financial behaviour**

From a theoretical model, Jappelli and Padula (2013) concluded that there is a positive relation between the degree to which families invest in financial literacy, and wealth accumulation. They emphasize, however, that this is not a causal relationship, since both decisions are influenced by preferences and the financial possibilities of the household.

Van Rooij et al. (2011) found a positive relation between literacy and investing in stocks. Again, this by itself does not imply a causal effect of knowledge on behaviour. To identify the causal effect, the authors used a similar strategy as Alessie et al. (2011). They found a significant positive effect of financial knowledge on participation in the stock market. This suggests they do better, since economic theory says that investing in shares is especially beneficial when it comes to long-term investments, of which retirement savings is the best example. Banks et al. (2010) found that people with larger numerical skills accumulate more
wealth, but their pension replacement ratio (the ratio between their retirement income and their income prior to retirement) was not higher. They concluded that numeracy has no effect on the extent to which consumption is smoothed over the life cycle.

Information seems to affect different target groups in different ways. Gathergood and Disney (2013) found that people who buy on credit (mail order companies, consumer credit, flash credit) are less financially literate than others, are less confident when it comes to interpreting credit terms, and make less use of opportunities for increasing their financial knowledge. These findings are in line with research of Shah et al. (2012), which showed that poverty and lack of self-confidence are important causes of poor use of financial resources and lack of attention for financial affairs, and by Sussman and Shafir (2012) who found that attitudes towards debt depend on a person's financial situation.

**Financial literacy, pension knowledge, and pension related behaviour**

Cappelletti and Guazzarotti (2010) studied financial literacy and knowledge of the pension system in Italy and their impact on participation in a supplementary pension savings scheme. They found that of the five questions on financial literacy, one – on the effect of inflation on purchasing power – is positively related to the decision to join a supplementary pension scheme; the others have no effect. On the other hand, three of the four questions on institutional pension knowledge are (positively) significantly related to participation. It is not clear whether the relationships are causal – it could well be that people learn about the pension system because they consider investing in a supplementary pension.

Landerretche and Martínez (2013) find a strong positive causal effect of knowledge of the Chilean pension system on holding voluntary financial savings and voluntary pension contributions. As an instrument, they use the presence in the household of someone who already receives a pension. This significantly affects pension knowledge (measured as the number of correct answers to six questions about the system). Under the assumption that the presence of a pension recipient in the household has no direct effect on the savings behaviour of the other family members, they concluded that more pension knowledge leads to more savings (given household composition and income).
Chan and Stevens (2008) found that the actual decisions to retire are better predicted by subjective than by objective measures of financial incentives for retirement. This means that people who have a biased view on their pension rules (how much do I get and how does this change if I retire earlier or later?) also run the risk to make retirement decisions that deviate from the optimal decision.

**Financial knowledge, intentions and planning, and financial behaviour**

Ameriks et al. (2003) showed that wealth is linked to the attitude of people to financial planning. They indicated that this is not a causal relationship from planning to wealth accumulation. They see financial planning primarily as a matter of discipline – an attitude rather than knowledge or acquired skills. Lusardi and Mitchell (2011b) find a link between financial planning, defined as thinking about the financial future, investing on the stock market, and wealth accumulation. Van Rooij et al. (2012) found a positive relationship between financial literacy and wealth; they suspect that this is due to an effect of financial literacy on investing in stocks.

Bernheim and Garrett (2003), Lusardi (2004), Bayer et al. (2008) and Clark and d’Ambrosio (2008) showed a positive relationship between participating in a retirement seminar and the intention to start saving more for retirement. Causality is not always clear, since people who are more interested in saving may want to attend the seminar (Alessie et al., 2011). In addition, intention is a poor predictor of behaviour in the pension domain: in a study of Choi et al. (2002), all participants said after a retirement seminar on employer sponsored plans that they would sign up for the pension scheme, but only 14% really did so. Choi et al. (2011) do a field experiment in which older workers are explained that they forego more than $500 per year by not to making maximum use of the premium matching by the employer. They found no significant effect of this information on actual behaviour.

Duflo and Saez (2003) tried to overcome the selection problem that those who participate in a retirement seminar are also more active with their pension, by allowing staff of some departments within a University to visit a pension information market, whereas other departments did not have this option. The treatment effect on savings is significant. Within the
treated departments, on the other hand, 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 is - colleagues visited the seminar and shared information with the Department, which may have the same effect as visiting the seminar in person. Duflo and Saez (2004) concluded from their own research and a survey of the literature on promoting retirement savings that information only has a small effect, that network effects are important, but that behavioural instruments have a tremendous effect (see Section 7).

Prast et al. (2012) asked people whether they would change their lifestyle if they were told that their future pension would be 25% lower than they thought so far. One in five said they would change something, including retiring later. One in three reported that adjustment would be wise, but said they would probably change nothing (with reasons like 'I would probably postpone'; 'not interested', or 'nothing I can do'). Further analysis shows that the intention to change behaviour depends on income (+) and the expected pension income replacement rate (-), but not on (self-assessed) financial knowledge.

Cox (2011) surveyed studies on information provided to participants in defined contribution (DC) schemes. He found that those who need the information the least make most use of it. Hackethal et al. (2012) concluded that banks give more advice to experienced customers with high net worth, not necessarily those who need the advice most. Bhattacharya et al. (2012) investigate who make use of the offer of a bank to a random selection of customers to free financial advice. Those who most needed advice, made the least use of it. This is in line with the aforementioned findings of Shah et al. (2012) and Sussman and Shafir (2012) that lack of resources and self-confidence prevents precisely those from using opportunities to get information and advice who would most benefit from these.

Amromin et al. (2013) concluded that some programs aimed at influencing financial behaviour of vulnerable groups seem effective, but that it is not clear whether knowledge promotion is the key or why some programs are successful and others are not. They also doubt whether the benefits outweigh the costs (see also Agarwal et al., 2010).
Van Rooij et al. (2007) find that Dutch people are not prepared to follow a course in personal financial planning, even if that would be free. Willis (2011) asked the following principal question when it comes to financial education and individual autonomy: Suppose people do not educate themselves financially, even if that free is. Should they then be forced to do so? This would interfere with individual autonomy, while individual responsibility is a reason to promote literacy. Willis (2012) states that increasing the welfare of families is the goal of financial education. Given the available knowledge she proposes to stop research into financial education as a means of promoting welfare; instead, we would need to explore how we can promote welfare directly.

7. The limited role of pension knowledge and awareness

In Section 2 we saw that pension awareness in the Netherlands is measured as knowledge about the level and adequacy of an individual’s own pension and self-assessed knowledge of the possibilities to improve pension adequacy if necessary. The pension awareness index is based on knowledge rather than awareness. This is not surprising from the traditional economic point of view that assumes that people who know the facts always make choices that fit their goals and capabilities. For pension awareness, however, planning and appropriate behaviour are very different.

Recent Insights from psychology and behavioural economics show that individuals do not always make optimal decisions, but are often guided by rules of thumb and influenced by the way in which possible choices are offered. This is not only true for the low skilled or for low-income groups but for all socio-economic groups in society (see, for example, Choi et al., 2006). It applies to many economic and financial decisions and certainly also to pension choices. It implies that pension knowledge alone is not enough – it must be converted into adequate choices. Moreover, it is a stylized fact that many people are hardly or not at all interested in their pension. In addition, pension decisions are complex while many people already have trouble with simple financial concepts and calculations (Lusardi and Mitchell, 2011b; Alessie et al., 2011). In this section, we first discuss the arguments that the psychological and the
behavioural economics literature that can explain potential barriers in the chain pension
knowledge → retirement planning → good pension choices.

**Multiple-selves**
The 'multiple-selves' theory states that our *future I* instinctively is a different person (Ainslie, 1992). This is more relevant as we look further into the future and consider an unpleasant situation – accident, disease, resignation, death, disability, poverty. This denial mechanism has a useful feature, because it sustains our ego and optimism. However, it has also a downside because it could lead to insufficient protection against major risks. This also explains why in some cases, legal rules protect us against our own behaviour. Examples are wearing seat belts in a car or wearing a helmet on a construction site. If we were rational, we would not need these rules (Akerlof and Dickens, 1982). Kopczuk and Slemrod (2005) show that the denial of our mortality can explain why people’s financial plans are suboptimal, from an otherwise rational model. For example, it explains why people transfer too little wealth to their children during their life. Herring and Wachter (1999) show that our assessment of probabilities both depends on objective factors (statistics) and subjective factors (imagination). If our assessment of a probability is below a threshold value, we act as if it is zero. If our imagination is activated, it can cause a behavioural change, even if the statistics are not changed and objective opportunities are not affected. That explains why we drive more cautiously just after seeing an accident, even though we know that the chance of an accident has not increased if we have just observed one. This is also not a learning effect, because the next day we drive as before the accident.

The effect of imagination (*salience*) has been demonstrated in a number of areas. Johnson et al. (1993) show that people are willing to pay a higher premium for a life insurance if the description uses words that induce fear, such as ‘terrorist attack’. Chetty et al. (2007) show that purchasing behaviour changes by adding the price excluding or including VAT to the price tag, even if people know exactly how much the sales tax amounts to.

There are studies that aim to learn more about ‘multiple selves’ via brain measurements, including studies in the area of pensions. Although people know that they may
well get old, they find it hard to picture themselves as older, not only because it is far away, but also because thinking of oneself as old is unpleasant. Everyone wants to get old, but no one wants to be old. Neuro-economic research among 20-30 year olds shows that thinking about saving for retirement leads to the same brain reaction as thinking of giving money to an unknown person (Ersner-Hershfield et al., 2009). Hershfield et al., (2011) show how much non-cognitive features matter. They ask some experimental subjects in their twenties to watch their own 'mirror image' as a seventy year old, while others simply watched their own reflection. Then the subjects were asked how they would divide a financial windfall over several categories. They found significantly more long-term savings among those who had seen themselves as an older person than among the control group. Recent work of Brüggen et al. (2012) is in line with this. They show that more consumers start saving if the effects of the savings decision for the future are visualized and thus get more emphasis, for example in the form of a luxurious or not so luxurious living environment. The type of financial language used can also play a role. Boggio et al. (2014), for example, suggest that the fact that financial language uses metaphors come from domains such as sports, games, war, construction that are more to the world of men (level playing field, strategy, price, offensive or defensive investing, construction of power) can contribute to explaining the gender gap in portfolio choice.

**The Elaboration Likelihood Model (ELM)**

The ELM of Petty and Cacioppo (1986) States that people process information in different ways. On the one hand, there is the *central route*: people form an opinion or make a decision by thinking carefully and process each piece of information accurately. On the other hand, there is the *peripheral route*: people form an opinion or make a decision using simple rules of thumb. Which route is taken depends on motivation and ability. Both are necessary for choosing the central route. Motivation requires commitment to the topic and a perceived need to think about it seriously. Young people who are not motivated to think about retirement because it is in the distant future, will not handle carefully and choose the peripheral route. Individuals motivated but unable to understand or process the information, will also take the peripheral route, due to lack of knowledge or time. Not only knowledge but also the
comprehensibility and complexity of the information are crucial in this respect. When someone is backing out of the central route and takes the peripheral road, what is done with the information depends on so-called peripheral stimuli that have nothing to do with the optimal choice, such as the attractive packaging of the message, the salience of specific features, referring to a reliable source, or generating emotions. Pension knowledge is therefore not enough. Kuiper et al. (2013) use this theory to stress the importance of involvement for pension related decisions, and argue that it implies that information should be accompanied by an emphasis on the actions that can be undertaken. Moreover, they advise avoiding giving too much information at the same time.

**Framing**

Framing is the phenomenon that the way in which a problem or situation is presented affects the response or decision of an individual (Keren, 2012). Framing plays a big role in choices in many different domains, such as health or consumption. Rothman and Salovey (1997) give a number of examples in the field of health choices. They show, for example, that people choose more often for a risky surgery if the risk is presented as positive (the chance of survival) rather than negative (risk of death). Framing also plays a role in the context of financial and retirement decisions. Card and Ransom (2011) show that voluntary pension savings are higher when the regular contribution to a company pension is presented as an employer contribution than if this is presented as a contribution of the employee (keeping constant the net wage the total contribution to the occupational pension). Brown et al. (2013) show that the age at which people in the US start claiming old age social security benefits depends strongly on how the rewards for delayed claiming are presented. Magen et al. (2008) show that inter-temporal choices change when the possibility of the most unattractive outcome is emphasized. This last example clearly illustrates the essence of framing: by focusing more on certain positive or negative aspects of a choice option, the weight of these aspects increases when the choice is made. The studies of Hershfield et al. (2011) and Brüggen et al. (2012) can also be placed in this context, since the treatments emphasize the future implications of the decision. According to
Keren (2012), framing means that it is important to present information as neutral and concretely as possible.

**Procrastination, complexity, and defaults**

There appears to be a significant difference between the financial plans that people make and their actual actions. Choi et al. (2002) find that after an information meeting about retirement planning all workers who attended announced that they would participate in the company savings plan, but only 14% really did so. An interpretation of this is that everyone is a planner and a doer (Thaler and Shefrin, 1981). The planner has a long time horizon and think rationally, but the doer looks only at the very short term. If the doer prevails, decisions made are not in the individual’s long-term interest. A theoretical explanation for this is a disproportionate time preference for today versus tomorrow, leading to time inconsistent decisions (*hyperbolic discounting*). Why open a savings account today if this can (almost) just as well be postponed until tomorrow? But the next day the same argument is used, etc. This type of procrastination can be avoided if people are stimulated (by external stimuli or by imposing some self-control mechanism) to act now.

Procrastination is enhanced when the choice is very complex. More choice is therefore not necessarily better. It leads to passivity and avoiding explicit choices and thus to choosing the *default* option, avoiding an active choice. It can also induce using other rules of thumb, such as avoiding extreme choices or choosing the middle option. See Kooreman and Prast (2010), Nijboer and Boon (2012) and Bodie and Prast (2011), for examples in the area of voluntary saving for additional pension. Nijboer and Boon (2012) and Bodie and Prast (2011) emphasize that the role of procrastination, defaults, etc. is extra strong because people cannot learn from mistakes they have made in retirement planning, and because the behavioural features of individuals’ decisions can be easily exploited by the providers of financial products.

On the basis of the large effect of defaults demonstrated in many studies on participating in the employer sponsored pension schemes, many companies in the US switched to a system in which joining the scheme was the default.\(^5\) Other firms were also interested in

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doing this, but feared liability problems. A default scheme also requires a standard contribution level and investment mix, and employers were afraid to be vulnerable to claims if the default choice would turn out to be unattractive *ex post*. The Pension Protection Act in 2006 aimed at avoiding this by regulating the investment mix for the default choice. New Zealand followed the example of the US. Barrett et al. (2013) described their successful experiments with changing the default into automatic enrolment in a supplementary pension; not participating is possible, but requires action. A similar development has recently started in the United Kingdom (Foster and Smetherham, 2013).

An appropriate default (participation in a standard plan) aims to encourage people to build an adequate pension and avoid procrastination. A limitation of a uniform default is that it typically does not take into account of special circumstances like career breaks. Ideally, the default should be tailored according to the individual situation of the employee. Bodie and Prast (2011) propose, for example, to classify workers on the basis of the information available to the employer (age, partner, homeowner, income, employment, number of years built up pension) and information from the tax office (ability, debt) into more homogeneous groups, with a group-specific default choice or an active choice between three preferred options for each group. This can be refined by measuring pension preferences using a pension decision tree and adjusting the options that are offered accordingly (Bodie et al., 2008).

It is clear that procrastination, passive choices, and other rules of thumb influence the market for pension products and have implications for pension communication. Bodie and Prast (2011, p. 22) do not expect much of a pension register unless it is accompanied by mechanisms that stimulate saving for a supplementary pension for those who need it, for example by including a link to a web site where such products can be acquired. Kooreman and Prast (2011) see less in giving transparent information than in facilitating independent expert advice, which is more in line with the new paradigm of "soft paternalism" and behavioural economics.

*Money illusion*

Money illusion is the tendency to think in nominal rather than real terms (Shafir et al., 1997). Bodie and Prast (2011) point out that money illusion explains why there is much less objection
against non-indexing of pensions than against nominal pension cuts. In their vision, providing nominal guarantees is misleading, since it reinforces money illusion by making inflation less salient. When pensions are presented in terms of purchasing power rather than nominal amounts, this may reduce money illusion and lead to a more realistic estimate of pension adequacy, better retirement planning, and better pension-related decisions.

**Risk**

Donkers et al. (2012) discuss the implications of cumulative prospect theory (CPT; Tversky and Kahneman, 1992) for financial behaviour of households and for policies aimed at improving household investment decisions under risk. The core of CPT is that expected utility is not calculated using the actual probabilities $p(i)$ on all possible outcomes $i$, but with transformed opportunities $\pi(i)$. Small probabilities are over weighted ($p(i) < \pi (i)$ if $p(i)$ is small) while large probabilities are underweighted. If, for example, a particular investment opportunity has a small chance of giving a very bad outcome, this will be weighted too heavily and this alternative will not be chosen, although it may produce the highest expected utility when objective probabilities $p(i)$ are used. Donkers et al. (2012) speak of biased attitudes and discuss ways to purge risky investment decisions of this distortion (*debiasing*). They also suggest that one way to avoid the bias may be to present risk in a complete and neutral way is the graphical tool of the distribution builder. An alternative applied in the Netherlands is the PGGM Pension explorer of Kortleve and Verbaal (2011). It gives the user the possibility to make choices such as longer working or make extra savings and indicates the consequences of those choices for the probability distribution of pension income.

Weber et al. (2002) conclude that in determining the individuals’ risk attitude, not only risk preferences, but also the own assessment of the ability to manage risk should be measured. When people overestimate their ability to manage risks, it can lead to a riskier choice than fits with own preferences, and vice versa. As well as Harris et al. (2006), they point out that this problem is more common among men than among women.
8. Policy implications

What are the implications of the literature that we have surveyed in terms of guidelines for public policy and good practice of the providers of pension products? Although there is consensus in the Dutch and international literature on the lack of pension awareness among large population groups, this does not translate into unambiguous policy recommendations aimed at a better preparation for retirement. In this section, we give our own suggestions for appropriate policies. We focus on the Dutch context but the recommendations also apply more generally.

Financial education

Some studies advocate mandatory financial education, starting with a financial planning at school box, arguing that it has been shown that there is a positive causal link between financial education, financial literacy, and thinking about pensions and retirement. Other studies, however, question whether such a policy makes sense, because of the high costs, or because thinking about retirement not always leads to taking the necessary measures, or even because of potential adverse effects of financial education, such as the risk that it leads to overconfidence.

Pension information

A second form of policy covers providing pension information. It fits the quest for a new uniform pension overview, not only aimed at informing the participant about the expected pension and its adequacy, but also at stimulating the participant to undertake actions to improve their pension in case this is necessary. As we saw, not much research has been done on the effect of specific information on behaviour. Regardless of the conclusion that pension information alone is not sufficient, the question is what type of information is optimal in a situation in which the worker bears a large part of the risks. The current approach in the Netherlands focuses on information about retirement income in euro’s, on transfer of knowledge of risk and return of supplementary pension assets, and (in the framework of the
European directive)\(^6\) measuring the investment experience and risk attitude of the consumers. Studies in the field of personal financial planning advocate, however, that information about adequacy of pension outcomes should be given, preferably in terms of standard of living, instead of about risk and return of investment choices (Merton 2006, 2010; Prast, 2007; Bodie et al., 2008; Goldstein et al., 2008). Policy makers and researchers often seem to take the absolute standard of living as a natural measure, but it is well known that people also (or even more) care about their standard of living relative to others (Clark et al., 2008). We are not aware of studies that discuss the implications of this for the pension domain.

**Pension information channels**

International research shows that the government, pension funds, employers, independent financial experts, and friends and acquaintances all play a role as a source for pension information. However, the implications of this for the optimal organization of pension information and communication are not studies. More attention for this is needed. That the Internet as a medium will play a key role when it comes to the dissemination of information is so far not confirmed by the facts. In 2012, only 33 percent of the working population had consulted their complete pension overviews in the Dutch pension register (Wijzer in geldzaken, 2013).

**Choice architecture**

There is consensus in the scientific literature about the large influence of choice architecture on pension decisions. Choice architecture refers to the way in which pension choices are offered. It starts from the notion that the idea of the fully rational consumer, who makes the best use of a wide range of options, is not realistic. Systematically informed or not, people make choices that are not optimal given their own targets, preferences and expectations. This is particularly the case in the area of pensions, where people have to think about the long-term

consequences of their decisions and have to look far ahead into the future, and cannot learn from their mistakes.

There are different views on what this means for policy, both in theory and in terms of practical feasibility. Critics point out that there is a risk that providers of pension products will offer choices in such a way that their own goal is pursued instead of that of the consumer. Others argue that providers do not dare to take responsibility because of fear of errors and claims, that providers may be unable to determine what is appropriate for a given individual. For example, there is a risk that low-income people end up in financial trouble if they are pushed towards retirement savings too much. On the other hand, advocates of exploiting choice architecture indicate that people are always affected by the way in which products are offered, so that it is better to offer choices in such a way that at least for most people, the choices improve. This particularly concerns the role of defaults, which usually exist either explicitly or implicitly. Camerer et al. (2003) argue, for example, that a good use of choice architecture implies that rational people (insofar as these exist) do not suffer, while non-rational people will benefit.

Exploiting choice architecture always requires that providers (or the policy maker, the pension sector, or employer) dare to make choices based on what they think will suit the wishes and goals of the individual. By setting the default and shaping the decision process, they then make it easier for the individuals to convert their preferences into fitting intentions as well as behaviour. The following four types of instruments are worth considering, in view of the results obtained in other countries:

- Offering mechanisms of self-control, allowing consumers to force themselves to take certain decisions and comply with them.
- Offering the option of supplementary savings with pre-sorted premium and portfolio (following the example of a collective health insurance offered through the employer)
- Offering choices in such a way that an active choice cannot be avoided
- Offering an appropriate supplementary pension savings plan as the default (“if we do not hear from you we will refund per month x extra premium with the degree of risk equal to y”)

This approach does not take the final responsibility away from the individuals, but stimulates them to take their responsibility. This is in line with the fact that 90% of the people indicate that they themselves are at least partly responsible for their retirement income (Wijzer in geldzaken, 2013).

An example is the case of self-employed workers who (in the Netherlands and many other countries) do not contribute to mandatory occupational pensions. Indeed, they may have good reasons to not save specifically for retirement (irregular income; investment in own company), but they may also often fail to save because of behavioural economic mechanisms. For example, they could benefit from a default with a monthly or quarterly pension premium linked to their sales tax remittance, instead of the current default of saving nothing at all. We recommend investigating the feasibility of this kind of instruments, using field experiments in the form of small-scale pilots.

In order to analyse how choice architecture can be applied in such a way that it benefits the consumers as much as possible, we suggest the following topics for further research:

- Investigate whether pension awareness can be raised by communicating in terms of living standard rather than income
- Investigate how different ways of communicating pension related risks affect the effectiveness of pension decisions
- Analyse which types of pension risk are most relevant; for example, analyse whether absolute standard of living matters or relative standard of living compared to others.
- Consider what people prefer: information in the form of a uniform pension overview or an accessible pre-programmed pension strategy offered by experts.
9. Conclusions
This paper has surveyed the literature on pension awareness. It has discussed how to define and measure pension awareness and focuses on the definition used by the designers of the Dutch pension awareness index. It refers to knowledge about the pension income level, but also to whether this is adequate or not and whether the individual knows what can be done if it is not.

Empirical studies have shown that pension knowledge and pension awareness are low in the Netherlands but also in other countries. Moreover, in spite of attempts to provide more information, pension awareness has hardly increased in the past decade. Large groups of people are poorly informed about the rules of the pension system and their own pension and of the expected level of their pension income. This also applies to the United States, where traditionally fewer people automatically participate in an occupational pension scheme so that saving for retirement is more often the individuals’ own responsibility. Also in countries with a mixed system such as Germany and the United Kingdom, there is little pension awareness, especially among young people and women.

There is a large literature on the determinants and effects of financial knowledge, but much less on specific pension knowledge. In the Dutch context, knowledge about the pension regulations is becoming more and more necessary due to recent changes in the labour market, with more flexibility and many employees who decide to become self-employed without mandatory occupational pension.

Several recent studies demonstrate causal effects of financial knowledge on thinking about retirement and of (the promotion of) financial literacy on financial and retirement behaviour. On the other hand, there are also studies that find no effect of financial education on financial literacy and no effect of literacy on behaviour. Pension knowledge and participation in a voluntary pension scheme seem to be related, but it is not sure if the first causes the second. There could be reverse causality, or both could originate from the same factors, such as a desire for financial planning. It is striking that pension awareness is especially high among age groups for whom it is too late for actions that lead to a higher pension income, assuming that possibilities for working after the standard retirement age is hardly ever an option. A lower
standard of living will result. Moreover, pension information and knowledge does not seem to reach the most vulnerable groups.

More pension knowledge does not automatically translate into (appropriate) actions for an adequate pension. Studies on the determinants of behaviour show that 'realizing' is probably more important than 'knowing', especially when it comes to a situation that we would rather not think about. It is crucial to reach vulnerable groups in a manner and at a time when more pension awareness still leads to actions that help to reduce pension deficits.

The changes to our pension system transfer more risk to the participants. In the future, their retirement income will depend more on investment returns, and the retirement age will increase with life expectancy of the population. This raises the issue whether current measures of pension awareness will remain feasible and meaningful in the future. It is worth considering changing the emphasis on future pension income to a focus on institutional pension knowledge, knowledge of the determinants of the future pension instead of the level, and on providing a limited number of meaningful and transparent choices for supplementary pensions to help realize the goal of the pension system.

We see it as the task of the Government, the pension industry, and academics in this field to search for the optimal mix of financial education, information and communication, sensible regulation and pension choice architecture. That optimal mix does not have to be the same for everyone: the literature shows that there are large differences both within and between socio-economic groups in knowledge, preferences, and strategies to acquire information and make decisions. In our view, the use of choice architecture can and must consider this.
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