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Effective approaches to improve retirement incomes in the context of behavioural biases and low levels of financial knowledge

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1. Individuals must increasingly take responsibility for their retirement. In OECD countries, funded private pension arrangements play a bigger role in retirement income provision, as a complement to pay-as-you-go public pensions. And within funded pensions, personal and defined contribution plans, where individuals need to make a full range of decisions, are growing in importance (OECD, 2016^[1]). This means that individuals are required to acquire more financial skills and take more responsibility for their retirement planning, as risks related to retirement saving (i.e. investment and longevity) are transferred to individuals.

2. More individual choice could be welfare enhancing if individuals can make informed decisions in line with their specific needs. Conventional economic theory assumes that individuals are rational agents who process all available information consciously to maximize their expected utility. In the field of pensions, this implies that people rationally plan their consumption over their whole life, by saving a portion of their earnings during working years to achieve a desired level of income during retirement.

3. Unfortunately, behavioural economics show that psychological factors actually prevent people from being fully-rational agents and affect people when making decisions for retirement. Generally low levels of financial knowledge compound the problem. Empirical research shows that most people fail to meet the retirement savings goals suggested by conventional economic models.

4. This document therefore focuses on behavioural biases and low levels of financial knowledge as two of the components of the wider concept of financial literacy. The OECD International Network on Financial Education (INFE) defines financial literacy as “a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing”. Therefore, the focus on this paper is narrower than financial literacy. Regarding financial literacy, the OECD has developed Recommendations, High-Level Principles and Frameworks to promote financial education, both for adults and young people, as a tool to improve financial inclusion and individuals’ well-being over their entire lifetime.¹ Adequate levels of financial literacy among the general population will however take time to materialise. In the meantime, other approaches like improvements in the design of

¹ See for example the OECD Recommendation on Principles and Good Practices for Financial Education and Awareness (OECD, 2005^[87]), the OECD Recommendations on Good Practices for Financial Education Relating to Private Pensions (OECD, 2008^[81]), the OECD/INFE High-level Principles on National Strategies for Financial Education (OECD/INFE, 2012^[88]), the OECD/INFE Policy Framework for Investor Education (OECD, 2017^[55]), the OECD/INFE Core Competencies Framework on Financial Literacy for Youth (OECD, 2015^[89]), and the G20/OECD INFE Core Competencies Framework on Financial Literacy for Adults (OECD, 2016^[90]).

retirement plans to address behavioural biases and low levels of financial knowledge are needed to improve retirement incomes.

5. This document identifies effective approaches to improve retirement incomes through a better design of funded pension arrangements in the context of behavioural biases and low levels of financial knowledge. It synthesises two documents discussed in 2017 by the WPPP ([DAF/AS/PEN/WD\(2017\)3](#) and [DAF/AS/PEN/WD\(2017\)16](#)). As behavioural biases and low levels of financial knowledge can affect different decisions that people need to make for their retirement in different ways, the document discusses separately different retirement-planning decisions.² The analysis concludes with a set of policy guidelines that could help policy makers improve the design of funded pension arrangements.

6. Policies aiming at improving the design of funded pension arrangements while addressing the issues posed by behavioural biases and low levels of financial knowledge can be divided into five categories.

- *Automatic features* are increasingly used to make funded pension systems more inclusive and help participants reach an adequate contribution level (e.g. automatic enrolment and automatic escalation of contributions). They harness the power of inertia to keep people saving for retirement.
- *Default options* help people who are unable or unwilling to choose a pension provider, an investment strategy or a post-retirement product.
- *Simplification of information and choice* can help people make better choices. This can be achieved through developing web applications, reducing the set of options, better disclosing information or facilitating the comparison of options.
- *Financial and non-financial incentives* are widely used to promote private pension arrangements as they harness individuals' tendency to respond to immediate gratification.
- Finally, *financial education* plays an important role in supporting individuals to make appropriate decisions. Conveying key information through pension statements, financial education seminars and financial advice can improve decision making.

7. Section 1 describes the challenges in decision-making for retirement and the varying needs for financial skills according to the type of pension arrangement. Section 2 explains why these challenges become problematic in the context of behavioural biases and low levels of financial knowledge. Sections 3 to 7 focus each on one key decision that people need to make when planning and saving for retirement (participation, contribution, provider selection, investment strategy selection, post-retirement option selection), highlighting how behavioural biases and low levels of financial knowledge specifically affect that decision and presenting effective approaches that may be used to address these issues and eventually improve retirement incomes. Section 8 concludes providing policy guidelines to assist policy makers to improve the design of their funded pension system in the context of behavioural biases and low levels of financial knowledge.

² This document does not consider decisions made by employers and how employers can help their employees meet their retirement income goal. This will be the subject of future research (see the project proposal in [DAF/AS/PEN/WD\(2018\)8](#)).

8. Delegates are invited to comment on the main messages of the document and in particular on the policy guidelines. Delegates are informed that this document, enriched by your comments, will be published in the 2018 edition of the OECD Pensions Outlook to be launch at the time of the next WPPP meetings scheduled for 3-4 December 2018.

1. Challenges in decision-making for retirement vary according to the type of pension arrangement

9. This section presents the challenges faced by individuals when planning for retirement. As developed in OECD (2016_[2]), those challenges vary according to the type of pension arrangement and are likely to be greater for people covered by: i) funded private pension arrangements rather than pay-as-you-go (PAYG) public pension arrangements; ii) personal pension plans rather than occupational plans; and iii) defined contribution (DC) schemes rather than defined benefit (DB) schemes.

General challenges common to all pension arrangements

10. There are some challenges that are common to PAYG and funded pension arrangements. In particular, people need a basic understanding of the main rules of the pension system. This includes being aware of the level of mandatory contributions, eligibility rules to receive benefits, how benefits are calculated, as well as how contributions, investment returns and benefits are taxed. In addition, when public pensions are means-tested, individuals need to be aware of the extent to which private pension benefits may affect the entitlement for and the level of their public pension.

11. People also need to be able to evaluate how different risks may affect their individual retirement situation. Several factors that influence the level of retirement benefits are inherently uncertain and risky. These include labour market risks (spells of unemployment and trajectory of wages during the career), financial risks (investment returns, inflation and interest rates), demographic risk (longevity) and political risk (uncertainty about future pension rules). For example, demographic risk refers to the uncertainty regarding the length of the retirement period as it depends on life expectancy. Although retirement benefits may not be directly impacted by increases in life expectancy, for instance in public PAYG DB pensions, it is important for individuals to be aware of population ageing trends in order to understand why and how pension systems may need to be reformed.

12. To grasp the potential impact on retirement income of financial risks, individuals need basic numeracy and financial knowledge. For example, people need to understand the concept of compound interest in PAYG notional DC schemes as well as in funded DC schemes to appreciate how pension wealth accumulates over time in such arrangements. Knowledge of inflation is important to understand mechanisms of revalorisation of pensions in payment.

13. Individuals also need skills to assess the need for pension reforms. They need to understand how wages and changes in the economy may impact PAYG pension arrangements. In particular, individuals need to comprehend that a pension promise in a DB arrangement may end up being too generous if the parameters of the pension system (e.g. age of retirement, accrual rate) are not adjusted to reflect new conditions (e.g. life expectancy improvements, decreasing working population).

14. Individuals' own decisions may also impact their future retirement income, in particular with respect to the age of retirement. Most OECD countries have a statutory

retirement age upon which people are entitled to get their pension, but allow people to retire earlier and/or postpone retirement within certain limits. Depending on the retirement age, pension benefits may be adjusted downwards or upwards, with the adjustment not necessarily actuarially neutral in order to incentivise or, conversely, discourage certain behaviours (OECD, 2017^[3]).³ Decisions about the retirement age therefore require individuals to have a basic understanding of how benefits are calculated.

15. This basic knowledge and understanding of the pension system is necessary to be able to form appropriate expectations about the level of future retirement benefits. It is important that people assess their retirement income needs, so that they can formulate a desired level of retirement income and react in case there is a gap between the expected and desired levels.

Specific challenges related to funded pensions

16. In addition to the challenges mentioned above, there are specific challenges related to funded pensions, which are often privately managed. What people need to know and be able to do varies according to the type of scheme, and in particular whether pension plans are mandatory or voluntary, occupational or personal, DB or DC.

Mandatory versus voluntary plans

17. In mandatory funded pension arrangements, individuals have a more limited set of decisions to make. They do not have to decide whether to participate in the plan and the contribution rate is set by law or regulation. Individuals or their employer can decide to make additional contributions. Individuals may also be able to choose the pension provider, the investment allocation and in which form benefits are received.

18. Voluntary funded pension arrangements usually offer greater flexibility and therefore require greater financial knowledge to make appropriate decisions during the accumulation and retirement phases. People may need to make a number of key decisions for their retirement at different stages of their lives, including whether to participate in the plan, how much to contribute, choosing the pension provider, how to invest their contributions and choosing the post-retirement product. Moreover, the number of available plans and investment portfolios can be quite large, adding to the complexity of making a choice.

Occupational versus personal plans

19. Personal pension plans usually require greater financial skills than occupational pension plans as they offer more choice. In occupational plans, employers take care of a number of plan design features, such as the choice of the provider, the amount contributed (possibly as a default), the investment strategy (possibly as a default) and the post-retirement product (possibly as a default). They can also negotiate lower fees for the administration of the accounts and the management of the assets. All those decisions typically fall under the responsibility of individuals in personal pension plans.

³ According to Queisser and Whitehouse (2006^[82]), a pension system is actuarially neutral when the present value of pension benefits is not affected by the decision to retire at a given age or a year earlier/later.

DB versus DC plans

20. DC pension arrangements provide a clear, straightforward link between pension contributions and pension benefits, but put most risks onto individuals. In those plans, assets accumulated at the end of one's working life (contributions plus investment income earned on those contributions) are used to generate a stream of income, thereby directly determining the amount of retirement income. However, individuals have to bear investment and longevity risks. As they bear the risks, individuals have more discretion about a number of plan design features in DC plans. In DB plans, the employer bears most of those risks.

21. DC plans require more financial skills than DB plans with respect to benefit calculation. In DB plans, benefits are usually calculated according to a formula based on past earnings, making it relatively straightforward for individuals to estimate their future level of retirement income. By contrast, benefits received from a DC plan depend on the amount contributed, the performance of the underlying investment and the remaining life expectancy at retirement. This means that they are more uncertain and difficult to predict.

22. DB plans usually automatically protect individuals from longevity risk, while longevity protection relies on individual choice in DC plans. DB plans are usually paid out in the form of immediate life annuities, with employers bearing longevity risk and limited choice for individuals. DC plans often offer choice for the post-retirement product between lump sums, programmed withdrawals, annuities, or any combination of the above. Decision about the post-retirement product requires an understanding of the characteristics of the different products available and of longevity risk, to be able to assess the implications for individuals' future standard of living during the whole retirement period. When choosing an annuity, people also need to figure out whether they want fixed-term or life annuities, single or joint, immediate or deferred, variable payments or fixed in nominal terms, with or without guarantees. Moreover, individuals should also appreciate how interest rates at the time of retirement may impact their annuity payment.

23. Finally, individuals need greater awareness of fees charged by pension providers to administer pension accounts and manage assets in DC than in DB plans. In DB plans, plan members have a promise on the level of pension they will receive and employers usually cover the costs of running the pension plan, meaning costs and fees do not directly affect retirement benefits. By contrast, in DC plans, fees have a direct adverse impact on retirement income. People need to realise that even a difference in fees charged of a few basis points can translate into large differences in assets accumulated at the end of the career.

2. Decision-making for retirement is complicated by behavioural biases and low levels of financial knowledge

24. Given the growing importance of funded pension arrangements, and especially DC plans, in retirement income provision across most OECD countries, individuals are more and more required to take responsibility for their retirement planning. However, most individuals may not be able or prepared to assume this role, due to behavioural biases and low levels of financial knowledge. A combination of lack of general financial knowledge and awareness of risk, poor pension-specific knowledge, as well as behavioural biases undermines people's ability to make appropriate decisions for their retirement.

25. Low levels of financial literacy are prevalent in many countries. Financial literacy is a broad concept that the OECD International Network on Financial Education (INFE) defines as “a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial wellbeing”. Cross-comparable data from 30 countries and economies show that overall levels of financial literacy are relatively low, with an average score of 13.2 out of a maximum of 21 (OECD, 2016^[4]). On average, only 56% of adults achieve the minimum target score on financial knowledge, with significant differences by gender, as 61% of men achieve the minimum target score, compared to 51% of women. The study identifies budgeting, planning ahead, choosing products and using independent advice as weak areas of financial behaviour. The analysis reveals low levels of understanding of basic principles relating to retirement savings, such as compound interest and risk diversification. Moreover, studies reviewed in Lusardi and Mitchell (2014^[5]) show that financial literacy is positively correlated with retirement planning, and that those who plan also accumulate more wealth.

26. People’s knowledge, understanding and engagement with pensions also tend to be low. In the United Kingdom for example, the 2017 Financial Conduct Authority’s Financial Lives Survey reveals that 32% of DC plan members do not know the size of their pension savings. This share is reduced to 26% for people aged 55 and over and not retired. Less than 20% of people aged 35 to 44 have thought a great deal about how they will manage financially in retirement. This increases to 35% of 45-54 year olds and 55% of 55 and over and not retired. Finally, most people (81%) with a DC pension state they have not given much thought to how much they should contribute to maintain a reasonable standard of living when they retire. In Germany, households with low education, low income and less financial knowledge did not adjust their retirement behaviour nor enrolled in complementary pension arrangements following 20 years of reforms that gradually reduced the generosity of public pension benefits (Börsch-Supan et al., 2015^[6]).

27. Behavioural biases can cause people to misjudge important facts or to be inconsistent over time. Behavioural biases “refer to the systematic, and most often unconscious, deviations from a strict economic model of rationality that many people exhibit in the face of (economic) decisions” (Lefevre and Chapman, 2017^[7]). They can be categorised according to the component of a decision that is affected: preferences, beliefs and decision-making processes (Table 1).

Table 1. Classification of behavioural biases related to retail financial services

Category	Bias	Description
Preferences	Present bias	People respond to urges for immediate gratification resulting in overvaluing the present over the future. As such, choices are regretted in the future. Present bias can lead to self-control problems such as procrastination.
	Reference dependence and loss aversion	When evaluating a product or future prospects, people do not think of the choice or product in isolation. Instead they assess it with respect to changes relative to a reference point, thinking in terms of gains and losses from that reference point. Preferences may therefore change when the reference point changes. In addition, psychologically, losses are felt roughly twice as much as gains of the same magnitude. Loss aversion may lead to the endowment effect (valuing a good more just because the individual owns it), a preference for the status quo and distortions in attitudes to risk.
	Regret and other emotions	People avoid choice or are willing to pay for products just to avoid making a decision that they may come to regret. They may also shy away from ambiguity, uncertainty or stress even if making a choice is likely to result in a positive outcome for them. Their choices can also be distorted by temporary strong emotions (e.g. fear).
Beliefs	Overconfidence	People can show overconfidence about the likelihood of good events occurring or their own ability and success at different tasks, including the accuracy of their judgements.
	Over-extrapolation	People often make predictions on the basis of only a few observations, when these observations are not representative. As a result, people also underestimate uncertainty.
	Projection bias	People expect their current tastes and preferences to continue in the future and underestimate the possibility of change.
Decision making	Mental accounting and narrow bracketing	Mental accounting describes how people treat money or assets differently according to the specific purpose that they have assigned to them, instead of treating all money as the same. Narrow bracketing describes how people often consider the decisions they take in isolation, without integrating these decisions with other decisions that affect their overall wealth and level of risk they take on.
	Framing, salience and limited attention	People may react differently to essentially the same choice situation because the problem is framed differently. Frames usually work by triggering a particular bias (e.g. loss aversion, reference dependence, regret, a rule of thumb), as certain information is made more salient and limited attention is paid to other factors.
	Decision-making rules of thumb	Consumers simplify complex decision problems by adopting specific rules of thumb (heuristics). When choosing from a wide range of options, people may choose the most familiar, avoid the most ambiguous or uncertain, choose what draws attention most (e.g. the first option on a list), or avoid choice, including sticking to the status quo. When estimating unknown quantities, people may anchor estimates to some relevant or irrelevant figure and adjust from there.
	Persuasion and social influence	Emotions and norms in social interactions are important: consumers may allow themselves to be persuaded to buy a product just because the sales person is 'likeable' and therefore trustworthy. Emphasising good personality traits or overemphasising bad personality traits may substitute for a reasoned judgement. Consumers may also be influenced by usage patterns without adequately considering whether those apply to their own circumstances.

Source: (Financial Conduct Authority, 2013^[8]).

28. Present bias, framing, use of rules of thumb, persuasion, overconfidence, over-extrapolation, loss aversion, and regret and other emotions particularly affect people when making decisions for retirement. First, present bias can be strong as saving for retirement is for the long term and may compete with short-term needs. Therefore, the

combination of delayed benefits until retirement and small short-term costs (e.g. transaction costs, paperwork) can be a real barrier to action, potentially impeding participation in retirement savings plans. Second, financial products, and in particular retirement products, are complex. Individuals usually view making financial decisions as difficult, unpleasant and time-consuming. They often lack the motivation to invest time and effort in making informed decisions and cannot evaluate many products given their complexity. They are therefore more likely to rely on simple rules of thumb and be sensitive to framing and persuasion. Third, effective retirement decisions require sophisticated risk assessments (e.g. longevity and investment risks). Most people lack the skills, practice or intuition to assess risk and uncertainty when making important decisions. Overconfidence and over-extrapolation may therefore lead individuals to underestimate uncertainty and risk. Fourth, many financial decisions are emotional. Emotions, whether positive (like optimism or excitement) or negative (like stress, anxiety, fear and regret), can drive decisions rather than a logical cost/benefit analysis. Finally, it can be difficult to improve one's ability to deal with retirement products over time. Decisions related to retirement planning are made infrequently. The consequences of these decisions are often only revealed long after the decision has been made, with little opportunity to learn and correct past decisions. Because of loss aversion and fear of regretting one's decisions later on, people may therefore fail to act.

29. The key decisions that people need to make for their retirement at different stages of their lives are whether to participate in a pension plan, how much to contribute, how to choose the pension provider, how to invest, and how to choose the post-retirement product. Financial literacy, and in particular behavioural biases and low levels of financial knowledge, may affect those decisions in different ways. The following sections therefore cover each of those decisions separately. The analysis focuses on the design of funded pension arrangements, as they pose more challenges in decision-making for retirement than PAYG pensions. OECD and non-OECD jurisdictions have implemented different policies to address the implications of behavioural biases and low levels of financial knowledge and, improving as a result the design of funded pension arrangements. These policies either simplify the decision-making process or aim to harness the power of behavioural biases to nudge people into acting in their own long-term interest.

3. Participation decision

How behavioural biases and low levels of financial knowledge affect the participation decision?

30. Present bias is one of the main behavioural biases affecting participation in voluntary funded pension arrangements. Because of present bias, individuals fail to commit to save for retirement. Procrastination, myopia and inertia lead many individuals to postpone or avoid making the commitment to save for retirement even when they know that this is ultimately in their best interest. In addition, retirement planning competes with other short-term needs, especially at younger ages (e.g. buying a house, pay tuition fees, raising a family).

31. The complexity of retirement savings products also makes it difficult for people to plan for retirement and properly assess how well prepared they are for retirement. Saving for retirement involves making complex financial decisions. One potential consequence of this complexity is that individuals delay facing these decisions. For example, Iyengar, Jiang and Huberman (2004^[9]) find that participation rates in 401(k)

pension plans in the United States decline as the number of fund option increases. Other things equal, every ten options added is associated with 1.5% to 2% drop in participation rates.

32. Additionally, many people seem to have a misperception of their retirement preparedness. As a result, they may fail to take action in case their future retirement income falls short of their expectations. For example, Munnell, Hou and Sanzenbacher (2017^[10]) show that 43% of households in the United States have a misperception of their retirement readiness, with 24% of households reporting that they are inadequately prepared while the index calculated by the authors says they are not at risk and 19% of households being less worried than they should be about their retirement preparedness. Those people who do not realise that they are at risk of being financially unprepared for retirement are unlikely to remedy the situation. Moreover, Balasuriya, Gough and Vasileva (2014^[11]) find that financial optimism is one of the most important factors explaining non-participation in pension plans.

Effective approaches to promote participation

33. Policies aiming at increasing participation in voluntary funded pension arrangements, while addressing the issues posed by behavioural biases and low levels of financial knowledge, fall into four broad categories: changing the default enrolment mechanism (active decision, compulsion or automatic enrolment), simplifying choice, providing financial (tax and non-tax) and non-financial incentives, and providing financial education.

Changing the default enrolment mechanism

34. In voluntary pension systems, the most common default enrolment mechanism is to consider that individuals do not participate in a pension plan until they actively decide to opt in. Removing or changing that opt-in default mechanism may result in increases in participation rates.

35. Active decision may increase participation. This mechanism removes the default opt-in enrolment mechanism and requires employees to decide whether or not to participate in their employer occupational plan within a certain timeframe. Requiring employees to explicitly state an enrolment preference encourages them to think about an important decision and avoids procrastination. However, under such an active decision mechanism, individuals have to deal with a potentially time-consuming and complex issue at a time which may be inconvenient. Carroll et al. (2009^[12]) compare two kinds of 401(k) enrolment in the United States: standard enrolment (i.e. the default is not to participate) and active decisions (i.e. there is no default but rather a compulsory choice between participating or not). The authors find that compelling new hires to make active decisions about 401(k) participation within 30 days raises participation after three months of tenure by 28 percentage points relative to a standard opt-in enrolment. Keller et al. (2011^[13]) suggest that an enhanced version of the active decision mechanism, highlighting losses incurred by not joining (e.g. not getting the employer matching contribution), would increase participation even further. Benartzi et al. (2017^[14]) show

that this type of nudge is more cost-effective than financial education, matching contribution and tax incentives.⁴

36. Compulsory enrolment is ultimately the most effective policy in reaching high and uniformly distributed coverage rates but has limitations (OECD, 2012_[15]). Under compulsion, the default for all eligible individuals is to participate in a pension plan, without the option to opt out. Compulsion addresses the issues posed by procrastination, myopia and inertia, ensuring that individuals save for retirement and start saving early in their career. However, compulsion may be difficult to implement, because mandatory contributions would be perceived as another tax. In addition, when there is already a mandatory public pension arrangement, participation in a complementary funded pension arrangement may not be beneficial for all individuals. If low-income workers can expect high replacement rates from the public pension system, forcing them to contribute may not be justified as it may lead them to become more indebted or divert funds from other necessary expenses, such as children education or housing. Finally, compulsory enrolment is of limited effectiveness when the informal sector is large.

37. Automatic enrolment has gained popularity in the last decade as an alternative to compulsory enrolment. Automatic enrolment involves signing up people automatically to a pension plan while giving them the chance to opt out with specified timeframes and conditions. The policy uses individual behavioural traits, such as inertia and procrastination, to keep people in a pension plan, as the default is to participate. At the same time, the opt-out option maintains individual choice and responsibility for the decision to participate in a pension plan. The popularity of this policy to increase participation in voluntary funded pension arrangements is growing. It is currently implemented in eight OECD countries: Canada, Chile (for self-employed workers), Germany, Italy, New Zealand, Turkey, the United Kingdom and the United States. Chile (for employees), Ireland and Poland may follow soon.⁵ Table 2 describes the automatic enrolment schemes already in place.

⁴ The authors compare the increase in pension contributions to the implementation cost of different policies. According to their calculations, the active decision mechanism generated USD 100 of additional savings per dollar spent. It was under USD 15 for all the other policies they looked at.

⁵ A pension reform proposal sent to the Chilean Congress in August 2017 includes the possibility for employers to automatically enrol their employees into collective voluntary pension savings plans on a voluntary basis. Ireland has announced in September 2017 that automatic enrolment will be introduced within the next three years. Poland envisages starting enrolling automatically employees into Employee Capital Plans (PPKs) from 2019.

Table 2. Description of automatic enrolment schemes

	Year of implementation	Mandatory for employers	Target population	Opting-out window	Contribution rates	Government financial incentives
Canada (1)	2014-2017	No, except in Quebec	Employees with at least 2 years of tenure	60 days	Employee: no minimum; Employer: voluntary	"EET" tax treatment
Chile	2012-2017		Self-employed workers	Submission of the income tax declaration	10% of covered earnings	"EET" tax treatment
Germany	2018	No	Private sector employees	Depend on agreement	Depend on agreement	"EET" tax treatment
Italy	2007	Yes	Private sector employees	6 months	Employee: voluntary; Employer: 6.91%	"ETT" tax treatment
New Zealand	2007	Yes	New employees aged 18 to 64	Between 2 and 8 weeks	Employee: 3% minimum; Employer: 3% minimum	50% matching contribution up to NZD 521.43; grants for homeownership
Turkey	2017	Yes	Employees younger than 45	2 months; re-enrolment every 2 years	Employee: 3% minimum; Employer: voluntary	one-time TRY 1 000 contribution; 25% matching contribution; subsidy equal to 5% of assets at retirement if 10-year annuity
United Kingdom	2012	Yes	Employees aged at least 22 and earning over GBP 10 000	1 month; re-enrolment every 3 years	From 2018, minimum 8%, including employer (3% minimum)	"EET" tax treatment
United States (2)	1998 (occupational plans)	No	New employees, potentially extended to all employees ("auto-sweep")	90 days	Employee: 3% minimum raising to 6%; Employer: matching contribution	"EET" tax treatment
	2017 (state auto-IRAs)	Yes	Private sector employees with no occupational plan coverage	Depend on state	Employee: Depend on state; Employer: not permitted	"TEE" tax treatment

Notes: "E" stands for exempt and "T" for taxed. 1. The Pooled Registered Pension Plan framework was introduced in 2012 at the federal level. So far, six provinces (British Columbia, Quebec, Manitoba, Nova Scotia, Ontario and Saskatchewan) have issued implementing regulations. 2. As of 1 March 2018, five states have enacted auto-IRA programmes for private sector workers (California, Connecticut, Illinois, Maryland and Oregon). Only Oregon had implemented its programme at the time of writing this document.

38. There is clear evidence that automatic enrolment increases participation in occupational pension plans at the company level. In the United States, automatic enrolment is estimated to increase 401(k) participation by 35 to 67 percentage points relative to voluntary opt-in arrangements (Madrian and Shea, 2001^[16]; Choi et al., 2001^[17]; 2004^[18]). In the United Kingdom, for eligible private sector employees, automatic enrolment led to an increase of 37 percentage points in the probability of participating in an occupational pension plan (Cribb and Emmerson, 2016^[19]).

39. The success of automatic enrolment in raising overall participation at the country level is not for granted however and depends on several factors: the scale of the implementation of the policy, the size of the target population, the presence of financial and non-financial incentives, and the opt-out prevalence.

40. Overall participation rates are likely to be higher when offering a pension plan with automatic enrolment is mandatory for employers. The role of employers is essential in automatic enrolment schemes. In Italy, Canada (in the province of Quebec only), New Zealand, Turkey and the United Kingdom, employers are mandated to automatically enrol their employees into a pension plan (occupational or personal). By contrast, in Canada (in the provinces of British Columbia, Ontario, Manitoba, Nova Scotia and Saskatchewan), Germany and the United States, employers can voluntarily offer an occupational pension plan and implement automatic enrolment. This difference may have large implications for participation, as the success of the policy in the case of voluntary involvement from employers will depend on the proportion of employers offering an occupational pension plan and, among them, the proportion implementing automatic enrolment. For example, in the United States, participation in occupational pension plans has remained constant over the last decades despite the increased use of automatic enrolment by employers.⁶ This is because the proportion of private sector workers being offered an occupational pension plan has stayed roughly at 50% since 1979 (Munnell, Belbase and Sanzenbacher, 2016_[20]).

41. The target population of automatic enrolment schemes usually excludes the self-employed. The only exception is Chile, where the automatic enrolment policy between 2012 and 2017 was specifically directed towards some categories of self-employed workers.⁷ In the other countries, only employees can be automatically enrolled. This restriction excludes an increasing share of the workforce.⁸ In Canada, New Zealand and the United Kingdom, self-employed workers can voluntarily join automatic enrolment schemes by contracting directly with a plan provider. This may not be sufficient however to reach high participation rates among these workers.

42. Other criteria may restrict the target population of automatic enrolment schemes, such as age, earnings and tenure in the company. A minimum entry age exists in New Zealand and the United Kingdom. However, people should be encouraged to contribute as early as possible in order to accumulate significant pension assets. There are discussions in the United Kingdom to reduce the age limit from 22 to 18 years old. In addition, some regulators may want to exclude people for whom pension contributions may not be affordable. Unfortunately, this may lead to exclude employees with multiple jobs who do not meet the criteria for automatic enrolment in any individual job although they could afford contributing to a pension plan. For example, in the United Kingdom, only workers earning over GBP 10 000 are eligible to be automatically enrolled by their

⁶ The proportion of all wage and salary workers aged 21 to 64 participating in an occupational pension plan has remained at around 46% between 1987 and 2013 (Copeland, 2013_[83]). The percentage of Vanguard DC plans with automatic enrolment increased from 15% in 2007 to 45% in 2016 (Vanguard, 2017_[21]).

⁷ In Chile, participation in individual retirement accounts is mandatory for employees and voluntary for the self-employed. The target population for automatic enrolment consists of self-employed workers who are paid for services delivered to a third party and who issue an invoice against which a tax retention is collected.

⁸ For example, in the United Kingdom, the share of self-employed workers in total employment has risen from 11.9% in 2000 to 14.9% in 2016 (Office for National Statistics, 2016_[84]).

employer.⁹ The British authorities could consider removing the earnings trigger and let individuals who cannot afford pension contributions to opt out. Finally, the impact of the policy on overall participation rates is likely to be lower when only newly hired employees are automatically enrolled. This applies in New Zealand and the United States, although in the United States, more and more plans with automatic enrolment extend the policy to all non-participating employees (Vanguard, 2017_[21]).

43. Countries can offer financial incentives to encourage automatically enrolled workers to stay enrolled and minimise opt-out rates, but also to nudge people outside the target population of the automatic enrolment scheme to voluntarily opt in. Financial incentives include employer contributions (Italy, New Zealand, the United Kingdom and the United States), tax incentives in the form of a favourable tax treatment compared to other savings vehicles (Canada, Chile, Germany, Italy, the United Kingdom and the United States), and non-tax financial incentives in the form of government matching contributions and fixed nominal subsidies paid in the pension account (New Zealand and Turkey).

44. Early withdrawals and contribution holidays can also be viewed as non-financial incentives to encourage people to stay in the scheme. Early partial withdrawals may be allowed to face financial hardship or serious illness, or to buy a home. It may however divert too much money that was initially intended to finance retirement and affect negatively future retirement income adequacy. Canada, Italy, New Zealand and the United States allow for early withdrawals under certain conditions.¹⁰ Similarly, allowing contributions holidays can reassure savers that they can temporarily stop contributing in case other expenses come along. However, it can also raise adequacy concerns, unless individuals increase their contributions to fill the gap afterwards. This option is available in New Zealand.

45. Overall, financial incentives may represent an important motivation to join or remain in a pension plan once automatically enrolled. According to a 2010 survey of KiwiSaver members in New Zealand, some of the most commonly reported reasons for joining the plan were the government payments (67% of respondents), the employer contributions (56%), the mechanisms facilitating the purchase of a home (24%), and the contribution holidays (12%) (Inland Revenue, 2015_[22]).¹¹

46. Opt-out rates vary greatly across countries. These rates, jointly with participation rates, can assist in measuring the success of automatic enrolment. Self-employed workers in Chile opt out in large numbers, with on average 75% deciding not to contribute to individual retirement accounts in every year during the programme. Preliminary information for Turkey suggests opt-out rates around 60%. Large opt-out rates can also be inferred for Italy as, by the end of 2016, members automatically enrolled only

⁹ This threshold is reviewed every year by the government. It used to be linked to the personal tax allowance but has been frozen at the GBP 10 000 level since 2014/15. This means that the threshold has increased in real terms, allowing more people to enter the target population.

¹⁰ An alternative solution currently explored is to link a short-term savings, or “sidecar”, account to a traditional retirement account to better meet consumers’ short- and long-term financial needs (Mitchell and Lynne, 2017_[85]; NEST Insight, 2017_[86]).

¹¹ Government payments include the kick-start NZL 1 000 contributions that all individuals who joined before 21 May 2015 received.

represented around 6% of new membership of private sector workers since 2007 (COVIP, 2017^[23]). At the other extreme are New Zealand and the United Kingdom. As of June 2017, 17% of all employees automatically enrolled in KiwiSaver plans had opted out and remained out of the scheme. In the United Kingdom, around 10% of people currently opt out of their workplace pension.¹² The length of the opting-out window may have an impact on opt-out rates, but there is no empirical evidence supporting that shorter windows reduce opt-out rates, or the opposite.

47. People who opt out tend to be in younger or older age groups, with lower earnings and less stable employment (Inland Revenue, 2015^[22]; Department for Work and Pensions, 2013^[24]; 2014^[25]). The main reason for opting out is being financially constrained. Older workers may also feel that retirement is too close to consider saving for retirement or that they already have sufficient savings. Preference for other forms of savings may also prompt people to opt out.

48. Opt-out rates may be larger when other incentives compete and interact negatively with the introduction of automatic enrolment. In Italy for example, automatic enrolment into a private pension fund is competing with the previously existing TFR system (*Trattamento di Fine Rapporto*). Private sector workers have to choose whether the future flows of severance pay contributions (set at 6.91% of salary) remain in the firm or are transferred in a pension plan. As both employers and employees highly value the TFR system, it creates an incentive to opt out of the pension arrangement (Rinaldi, 2011^[26]). In Turkey, automatic enrolment supplements existing pension provision. Employees already contributing to a personal pension plan, that already enjoys the government matching contribution, may not want to cumulate both schemes.

49. Finally, re-enrolling workers who have opted out may help bring opt-out rates down. In Turkey and the United Kingdom, employers are required to re-enrol their eligible workers who chose to opt out or cease membership at regular intervals (every two years and every three years respectively). This gives employees the opportunity to think again about their finances and pension savings options in case their situation has changed since they decided to opt out. Early results in the United Kingdom show that around 60% of employees working for medium employers and 45% of employees working for large employers, who originally stopped saving and have been automatically re-enrolled, are now saving into an occupational pension plan (Department for Work and Pensions, 2017^[27]). This re-enrolment system however also implies an additional burden on employers who have to keep track of each employee's status as regard membership, reassess the eligibility of employees who opted out or ceased membership, and automatically enrol them back.

Simplifying choice

50. Simplifying the enrolment process, in particular by using default mechanisms, can increase participation in funded pension arrangements. In 2010, the single most reported reason for joining KiwiSaver was that it was an easy way to save, as reported by 77% of KiwiSaver members (Inland Revenue, 2015^[22]). The features that make it easy to join KiwiSaver are the default mechanisms (automatic enrolment, default contribution rate

¹² It remains to be seen how this rate will evolve when the contribution rate increases to 8% as of April 2019 (from 2% up to April 2018).

and default provider), as well as the fact that it is administered by the employer, with deductions made at source.

51. Using default options for the contribution rate and the investment strategy can reduce choice overload and simplify the decision about whether to participate in a pension plan. In the United States, some employers have voluntarily tested an alternative form of enrolment to traditional opt-in programmes (i.e. the default is not to participate) and automatic enrolment (i.e. the default is to participate) called Quick EnrollmentTM (Choi, Laibson and Madrian, 2009^[28]; Beshears et al., 2013^[29]). This programme gives workers the option of enrolling in the 401(k) plan provided by their employer by opting into a pre-set default contribution rate and asset allocation. The goal of this policy is to reduce complexity. Instead of evaluating all possible contribution rate and asset allocation options, employees just face a binary choice between participating based on the default options provided by the programme and non-participating. Studies show that Quick Enrollment results in substantial 401(k) participation increases, although typically smaller than automatic enrolment. Relative to a standard enrolment mechanism in which employees must actively select both a contribution rate and an asset allocation, Quick Enrollment increased the participation among new hires by 16 percentage points after three months of tenure and prompted 10% to 20% of previously hired employees who were not participating in their 401(k) plan to enrol in the plan. They also find that the participation increases produced by Quick Enrollment are durable and that employees who join the pension plan in this way often remain at the default contribution rate and asset allocation for years.

Providing incentives

52. Financial incentives for retirement savings reduce the cost of saving and therefore encourage people to save in pension arrangements rather than to consume or save in other types of vehicle. Even when people know that saving for retirement is for their own best interest, present bias represents a real barrier to action. People need an extra motivation to put money aside for retirement. Financial incentives harness individuals' tendency to respond to immediate gratification to make them save for retirement. Loss aversion can also be a driver of taking advantage of financial incentives, in particular employer and government contributions, if people do not want to "leave money on the table" by not joining a pension plan or contributing below a certain level.

53. Financial incentives, tax and non-tax, are effective in promoting retirement savings (see [DAF/AS/PEN/WD\(2018\)1](#)). Tax incentives arise from deviating from the typical tax treatment of savings (i.e. contribute from after-tax earnings, pay tax on the investment income and withdraw money tax free). Allowing individuals to deduct pension contributions from taxable income encourages participation in retirement savings plans for middle-to-high income earners, because individuals respond to the upfront tax relief on contributions that reduces their current tax liability. Low-income earners are however less sensitive to tax incentives, because of insufficient income to afford contributions, insufficient tax liability to fully enjoy tax reliefs and lack of understanding of tax-related issues. Low-to-middle income earners are more likely to respond to tax incentives by increasing their overall savings, while high-income individuals tend to reallocate their savings. Non-tax incentives are payments made by the government or the employer directly in the pension account of eligible individuals. They include matching contributions and fixed nominal subsidies. These incentives increase participation in retirement savings plans, especially among low-income earners for the latter.

54. Tax incentives are however difficult to understand, potentially leading individuals to misjudge them and fail to pick the most appropriate tax regime when choice is provided. For example, some occupational plans in the United States provide choice between taxation upon withdrawal (“EET” tax regime, e.g. traditional 401(k)) and upfront taxation (“TEE” tax regime, e.g. Roth 401(k)). Beshears et al. (2017_[30]) show that less than half of DC plan participants surveyed online respond correctly to questions related to the tax rules of Roth and traditional 401(k) plans.

55. In addition, behavioural biases may lead to a different perception of the two tax treatments. Contributions to plans with taxation of withdrawals immediately reduce the participant’s income tax due. Plans with upfront taxation do not provide tax relief today. Because of present bias, individuals may want to secure the tax advantage earlier rather than later and therefore prefer taxation upon withdrawal. Other behavioural factors could lead individuals to prefer upfront taxation. For example, Cuccia, Doxey and Stinson (2017_[31]) show that uncertainty may lead to anxiety and influence plan choice. Plans with taxation upon withdrawal may be perceived as more uncertain than plans with upfront taxation because the amount of taxes that will be due on withdrawals is unknown, as tax rates may change, as well as the individual’s economic status. Behavioural biases and low levels of financial knowledge may therefore lead some individuals to fail to choose the plan with the tax treatment that would provide them with the largest overall tax advantage.

56. Non-financial incentives in the form of attractive product features can also be provided and encourage participation. Allowing participants to access their funds before retirement or stop temporarily to make contributions have already been discussed above, in the context of automatic enrolment. Providing investment return guarantees is another possibility.

57. Investment return guarantees alleviate the impact of market risk on retirement income by setting a floor on the value of accumulated assets at retirement, either in nominal or real terms. They provide some predictability in the savings phase with respect to future pension benefits. They may increase the attractiveness of saving for retirement in DC pension plans as they overcome people’s fear of losing the nominal value of their contributions. However, their need should be assessed in the context of the overall pension system, as other mechanisms, such as public pensions’ automatic stabilisers and old-age safety nets, may already provide a floor or minimum income at retirement.

58. Investment return guarantees have to be paid for, and this cost reduces the expected value of benefits from DC plans relative to a situation where there are no guarantees (OECD, 2012_[32]). The cost of the capital guarantee, that makes sure that people will get back at least their contributions (in nominal terms), is affordable over sufficiently long holding periods. Guarantees above the capital guarantee may be too costly, however. In addition, in the new environment of low interest rates, investment return guarantees require higher technical provisions, meaning that the investment opportunities of the pension providers are limited to investment products with lower risk and thereby lower expected returns. Lower risk eases the pressure on solvency, but eventually, lower expected returns can make it difficult for pension providers to generate returns that are sufficient to meet their guarantees. Some countries are therefore moving away from investment return guarantees, such as the Czech Republic, Denmark and Germany.

Providing financial education

59. Policy makers increasingly recognise the role of financial education in supporting individuals to plan for their retirement. OECD (2016^[2]) summarises the different financial education tools used in different jurisdictions to address various financial education needs in relation to retirement planning. These can be split into three broad categories:

- Providing information on retirement options and increasing awareness of retirement issues: this includes general information through websites, awareness campaigns covering retirement issues, comparison tools presenting plan features in a standardised way, personalised pension statements, access to personal information online, as well as calculators and simulators;
- Instruction: this takes the form of seminars and workshops about retirement planning, helping participants acquire financial knowledge and skills relevant for retirement, explaining the risks that individuals may be exposed to and suggesting how to manage them, and helping individuals estimate their retirement income needs;
- Advice: this ranges from factual information to fully personalised advice.

60. Evidence on the effectiveness of financial education for retirement is currently limited but suggests that instruction at the workplace can be effective in increasing enrolment in occupational pension plans (Atkinson et al., 2015^[33]). For instance, Duflo and Saez (2003^[34]) studied a university that encouraged a random sample of its employees to attend to an annual event providing information on benefits, including an occupational pension plan. They found that 5 to 11 months after the event, plan participation was higher in treated departments (i.e. those where a random sample of employees received an invitation letter promising a reward for attending the event) than in control departments. Collins and Urban (2016^[35]) show that online financial education courses offered to employees increase self-reported IRA participation by six percentage points. Anderson and Collins (2017^[36]) find that a multi-media education effort towards women, providing information through emails, webinars and live events, reduces the gender gap in participation in retirement savings plans.

61. Providing more information on the employer's pension plan and how to join it can also increase participation. Clark, Maki and Morrill (2014^[37]) find that young employees (18 to 24 years old) who received a flyer containing information about their employer's 401(k) plan and the value of contributions compounding over a career, were more likely to begin contributing to the plan compared to workers of a similar age that did not receive the flyer. Lusardi, Keller and Keller (2009^[38]) study the impact of helping employees form and implement a savings plan through the provision of a planning aid that (a) encourages individuals to set aside a specific time for enrolling in their savings plan, (b) outlines the steps involved in enrolling in the plan (e.g., choosing a contribution rate and an asset allocation), (c) gives an approximation of the time each step will take, and (d) provides tips on what to do if individuals get stuck. This planning aid increased enrolment in the occupational pension plan by 12 to 21 percentage points for newly hired employees.

62. However, not all types of information lead to increased participation in retirement savings plans. For example, Beshears et al. (2015^[39]) show that information about peers' saving behaviour may discourage participation by generating "oppositional reaction". The authors conducted a field experiment to assess the impact on retirement savings choices of disseminating information about what a target population's peer usually do. The expectation was that individuals may realise that participating in their employer's 401(k)

plan is more common than they had previously believed among their co-workers, and thereby that social influence would motivate them to enrol in the plan. In fact, the results show that the presence of peer information decreased the likelihood of subsequently enrolling in the plan, especially among employees with relatively lower income. This result suggests that information about peers' savings choices may discourage low-income employees by making their relative economic status more salient, reducing their motivation to increase their retirement savings.

4. How much to contribute

How behavioural biases and low levels of financial knowledge affect the level of contribution?

42. People have to figure out how much money they will need in retirement in order to determine how much they should put aside to cover those needs. Determining the appropriate contribution rate is mostly relevant for DC pension arrangements, as in DB plans members usually have no choice over the contribution level and their benefits are pre-determined according to a formula. In mandatory systems, the contribution rate is determined by regulation but people need to assess whether they need to complement it with voluntary contributions. In voluntary systems, people can usually choose how much they want to contribute, although some minimum may be prescribed by regulation. In any case, people need the numeracy and financial skills to assess whether their contributions will translate into an income that will cover their needs in retirement. That assessment should be done given the level of retirement income that may be expected from the public pension system, which requires a good level of understanding of the rules used to compute public pension benefits. Unfortunately, behavioural biases affect this assessment.

43. The main behavioural biases affecting how much people contribute in DC pension arrangements are self-control, use of simple heuristics, projection bias and loss aversion.

44. Saving for retirement requires self-control. When surveyed about their low savings rates, many households report that they would like to save more but lack the willpower. For example, Choi et al. (2001^[17]) report that 67.7% of their sample of 401(k) participants think that their contribution rate is "too low." However, procrastination makes them postpone action to increase their contribution rate. Among self-reported under-savers, 35% expressed an intention to increase their contribution rate in the next few months, but only 14% of this subgroup actually increased their contribution rate in the four months following the survey. People tend not to follow through on their good intentions. For the same reason, people automatically enrolled tend to stick to the default contribution rate for long periods, even when this default is not the optimal rate for them (Choi et al., 2004^[18]).

45. There are no satisfactory heuristics that could help people approximate a good contribution rate. The most common heuristics in place appear to be to save the maximum allowed by law to get tax incentives or to save the minimum necessary to receive the full matching contribution offered by the employer or the state. Neither of these amounts however was most likely computed to be the most appropriate contribution rate for everyone.

46. Projection bias may also interfere with the contribution level chosen by individuals. People may indeed underestimate how much income they will need during

retirement if they base their assessment on their current needs and preferences or if they underestimate their life expectancy. They may underestimate the fact that their preferences and circumstances may change when they get older and therefore fail to save enough for retirement.

47. Finally, loss aversion affects savings. Many studies show that people have the tendency to weigh losses significantly more heavily than gains (Kahneman and Tversky, 1979_[40]). Losses hurt roughly twice as much as gains yield pleasure. Once people get used to a particular level of disposable income, they tend to view reductions in that level as a loss. Thus people may be reluctant to increase their contributions to their private pension plan because they do not want to experience a cut in take-home pay.

Effective approaches to promote appropriate contribution levels

63. The appropriate contribution rate to pay in a funded pension arrangement depends on the target retirement income, the risks involved in saving for retirement, and the risk aversion of the individual. Retirement income in DC pensions is uncertain and depends on the level of contributions, the contribution period and other unpredictable parameters such as life expectancy, investment returns, discount rates, spells of unemployment. The larger the contribution rate, the higher the probability of reaching a given target retirement income for a given contribution period. For example, according to OECD calculations, a contribution rate of just below 13% over 40 years is needed to reach a target replacement rate of 30% with a 95% probability (OECD, 2016_[41]). With a contribution rate of 7.75% the likelihood to reach that 30% target falls to 75%. Individuals therefore need to be aware that a given contribution rate may not be sufficient to reach their target retirement income in all circumstances.

64. Policies helping individuals to contribute at the appropriate level given their individual circumstances, while addressing the issues posed by behavioural biases and low levels of financial knowledge, include setting default contribution rates at higher levels than current practice, automatically increasing contribution rates over time, providing matching contributions, simplifying the contribution process and providing information about expected pension benefits.

Setting default contribution rates at high levels

65. Default contribution rates are a typical feature of automatic enrolment schemes to simplify the decision about whether to participate in a pension plan. To minimise opt-out rates, they are usually set well below 13%. The total minimum contribution rate is 6% in New Zealand (3% from employees and 3% from employers), 3% in Turkey (only from employees) and will reach 8% in the United Kingdom as of April 2019 (5% from employees and 3% from employers). In 2016, 52% of automatic enrolment plans in the United States had a default contribution rate of 3% or less, according to a survey (Vanguard, 2017_[21]). Goldin, Homonoff and Tucker-Ray (2017_[42]) show that more U.S. military service members chose to participate in the Thrift Savings Plan when the default contribution rate was low (1-2%) rather than medium (3-5%) or high (6-8%). Therefore, the current design of automatic enrolment schemes may not be conducive to contribution rates that allow people reaching their target retirement income.

66. Moreover, individuals tend to stick with default contribution rates even when they are too low to reach a target replacement rate. Default options in general reduce individuals' engagement regarding retirement planning. Because of inertia and procrastination, individuals may fail to consider other options in the presence of a default

and remain in sub-optimal arrangements. Research suggests that some individuals who remained with the default contribution rate would have chosen a higher savings rate in the absence of automatic enrolment (Madrian and Shea, 2001_[16]; Choi et al., 2004_[18]).

67. Higher defaults may increase contribution rates without harming participation. Relative to a 6% default contribution rate, Beshears et al. (2017_[43]) show that higher defaults (from 7% to 11%) increase average contribution rates 60 days after a website visit by 20 to 50 basis points of pay, without a decline in participation rates, except for the highest default (11%). To make sure that higher defaults do not induce people to contribute more than what they can afford, the experiment featured a tool showing the implications of a given contribution rate for the employee's ability to achieve a specified target retirement income. The average contribution rates for the 7% and 11% defaults were not statistically different from one another, showing that employees did not seem to unthinkingly accept high defaults.

68. Default contribution rates are not a panacea however when they apply to a large number of people with heterogeneous needs and preferences. Default options are designed for an average or reference individual and therefore may not be optimal when they apply to individuals with highly heterogeneous situations. For example, a single contribution rate may not be appropriate for prime age workers and older workers. The former may be financially constrained because they face other important expenses (e.g. mortgages, education), while the latter may be worried about their retirement and willing to save more. In this context, it may be appropriate to have contribution rates increasing as people age (Blake, Wright and Zhang, 2014_[44]). However, one needs to be careful about the potential time inconsistency of contribution rates as contribution rates may need to reach extremely high levels at the end of one's career in order to attain the same target retirement income (OECD, 2012_[45]).

Automatically increasing contribution rates

69. Automatically increasing contribution rates is an alternative way to the standard single rate for setting up default contribution rates. People can commit to future increases, preferably linked to wage increases, or can agree on immediate contribution increases.

70. Higher contribution rates can be achieved by allowing people to commit to future increases in the contribution rate. For example, Thaler and Benartzi (2004_[46]) introduced Save More Tomorrow™ ("SMarT") in the United States. The objective is to build on people's awareness of their own tendency to procrastinate and help those who would like to save more but lack the willpower to act on this desire. Employees have the option of committing themselves in advance to increasing their contribution rate in the future, with increases happening each time the individual gets a pay rise. This feature mitigates the perceived loss aversion of a cut in take-home pay and avoids the affordability issue of increased contributions for low-income earners. The contribution rate continues to increase on each scheduled salary increase until the contribution rate reaches a pre-set maximum. In this way, inertia and status quo bias work towards keeping people in the plan. The employee can opt out of the automatic escalation at any time. Results show that SMarT participants almost quadrupled their contribution rates over the course of 40 months, from 3.5% to 13.6% on average.

71. Making it easy to increase contribution rates can also achieve positive outcomes. For example, Easy Escalation™ allows employees already participating in a pension plan to increase their contribution rate to a pre-selected level. The principle is that employees already participating in the company pension plan and whose contribution rate is below

6% receive a form in which they just need to tick a box to increase their total contribution rate to the 6% threshold. Beshears et al. (2013^[29]) find that about 15% of low contributors who received an Easy Escalation form raised their contribution rate to the pre-selected threshold, as compared to only about 1% of those who did not receive the form.

Providing matching contributions

72. Employer matching contributions encourage participation in occupational pension plans and can also be seen as a way to promote employee contributions. As the employer contribution is defined as a ratio of the employee's own contribution, the more the employee contributes, the higher the employer's contribution will be, up to a limit.

73. A higher match rate does not necessarily lead to a higher employee contribution. Choi (2015^[47]) and Madrian (2013^[48]) show that the empirical evidence in the United States on the impact of employer match rate on total contributions is mixed. Some studies find a positive relationship between the match rate and contributions, others find no relationship and yet other studies find a negative relationship. By contrast, when the Australian government reduced the match rate and the maximum entitlement by half in its super co-contribution programme in 2012, the number of beneficiaries and the co-contributions payments dropped by 40% and 60% respectively the following year.

74. However increasing the rate of employee contribution up to which the employer offers the match, the match threshold, may have a positive impact on employee contributions. Choi et al. (2001^[17]) study a company with a 50% match rate that increased its match threshold from 5% to 7% of income for union workers and from 6% to 8% of income for management employees. They observe an immediate change in the distribution of employee contribution rates towards an increase in the proportion of participants contributing between 7% and 8%.

Simplifying the contribution process

75. Simplifying the contribution process may increase voluntary savings, in particular in personal pension systems. Individuals may find it difficult to save for retirement without the involvement of employers. Mexico introduced a whole new strategy to promote voluntary savings in the pension system to encourage all types of worker, formal and informal, to save for retirement. The strategy includes more and better information for people through communication campaigns and websites, a network of more than 7 000 convenience stores all around the country where people can deposit voluntary savings, the use of debit cards to save a proportion of spending through an application, and the launch of an application where people can have access to many services, including opening a pension account and save online. The results are promising so far, with the balance of voluntary savings growing on average by 33% annually since 2014.

76. Sending reminders can also improve savings. Reminders provide associations between future expenditures and today's choices. They can thus help mitigating present bias. For example, Karlan et al. (2016^[49]) compare the savings patterns of individuals in three different banks in Bolivia, Peru, and the Philippines. Those who received a monthly reminder via text message or letter saved 6% more than those who did not. Reminders also made individuals 3 percentage points more likely to reach their savings goal by the end of the commitment period.

Providing information about expected benefits

77. Salient information about retirement and expected benefits can also increase contributions to private pension arrangements. For example, since 2004, the German pension authority sends out annual letters which provide detailed and clear information about the pension system in general and individual expected pension payments. The letters also highlight the importance of additional voluntary retirement savings. Using tax return data from administrative records, Dolls et al. (2016_[50]) find that receiving the letter increases contributions to a Riester pension plan (excluding subsidies).

78. Personalised information, as opposed to general information, could encourage people to increase contributions. Fuentes et al. (2017_[51]) show the results of randomly giving low- to middle-income workers in Chile either personalised or generalised information regarding their pension savings. Individuals in the treatment group received a personalised estimate of their expected pension under different scenarios: status quo, increasing the contribution density, increasing voluntary savings, and delaying retirement by one year. Individuals in the control group received comparable general information and recommendations on how to improve their future pensions but without any reference to their individual situation. Compared to the control group, the level of voluntary savings of individuals who received personalised information was 14% higher on average during the 6 months following the intervention. The positive effect of personalised information was not permanent however, with no difference in the level of voluntary savings between the two groups after nine months.

79. Finally, calculators and simulators can facilitate the estimation of the contribution rate needed to cover people's needs in retirement and reduce the difficulties related to lack of numeracy. By providing forward-looking information under different scenarios, they make the long-term benefit of saving more salient and improve awareness of the link between contributions and retirement income (OECD, 2016_[2]). In addition, they usually allow users to assess how their retirement income would change if they change their expectation regarding the retirement age or the contribution rate for example, or if external parameters (e.g. rate of return, inflation) change. Moreover, by combining information about the different sources of retirement income (e.g. public and private), simulators and calculators help people realise whether their overall target replacement rate can realistically be achieved given their current saving behaviour. Such calculators are available for instance in Chile, Latvia, Mexico, the Netherlands and the United Kingdom.

5. Choice of the pension provider

How behavioural biases and low levels of financial knowledge affect the choice of the pension provider?

80. Participants in private pension plans are expected to choose among pension providers the one that best fits their needs. This choice should be driven, among others, by comparing the services offered, the long-term performance, and the fees charged. Comparing pension providers however takes time and effort. In addition, behavioural biases and low levels of financial knowledge affect how people choose, which could lead to lower competition between pension providers and ultimately increase costs and fees and reduce future retirement incomes.

81. People may lack the skills to compare pension providers and choose the best one for them, in particular when many providers are available (choice overload) and pricing

practices are complex. For example, when pension providers use different fee structures, it becomes difficult for individuals to compare pension plans. This is the case in Latvia, Poland, the Slovak Republic and Slovenia for example, where some private pension funds can use a mix of asset-based and contribution-based fees.

82. Behavioural biases may create or strengthen market power in what would otherwise be a competitive market (Financial Conduct Authority, 2013_[8]). Because of procrastination and inertia, pension plan members tend to stick with their existing provider, do not shop around, do not compare providers based on their most critical characteristics, and do not switch to better providers. For example, in Mexico weak member engagement and understanding reduced the effectiveness of two traditional competition policies, increasing the number of providers and allowing people to switch between providers. These policies have actually led to higher costs and less competition. In the United Kingdom, in 2012, 60% of individuals purchased an annuity with their existing provider, even though an estimated 80% of these individuals could have gotten a better deal elsewhere (Financial Conduct Authority, 2014_[52]).

83. Finally, framing, persuasion and simplistic rules of thumb may guide individuals' choice of the pension provider rather than thorough analyses of the providers' most critical characteristics. Individuals may not choose the appropriate provider if they focus on the information highlighted by pension providers and underweight or ignore the non-salient, but potentially important, pieces of information. In addition, individuals may choose a specific provider because they know the brand name of the management company, because the sales person was nice to them, or because that provider was first in the list of options.

Effective approaches to facilitate provider choice

84. Competition between pension providers may not be effective as a result of behavioural biases and low levels of financial knowledge. Approaches facilitating provider choice while strengthening competition include defaulting people into providers chosen through a tender mechanism and enhancing information disclosure and standardisation to ensure that members receive timely details on the fees they pay and can compare them across providers. These policies need to be complemented by measures improving efficiency in the pension industry, so that individuals can expect good value for money independently of the choice of the provider.

Selecting default providers through tender mechanisms

85. Chile and New Zealand have introduced tender mechanisms to strengthen competition and reduce fees paid by members. There are a number of differences between the two systems. First, the number of providers selected at the end of each tender is different. Only one is selected in Chile, while several are in New Zealand (six in 2007, nine in 2014). Second, the provider winning the tender receives all new members of the pension system in Chile. In contrast, winning providers in New Zealand become default providers and only receive individuals not choosing their provider and working with an employer who has not designated a scheme.¹³ Third, the period covered by the tender is longer in New Zealand, seven years, as opposed to two years in Chile. Fourth, there are more criteria to decide the tender for KiwiSaver default providers. The basic criteria for

¹³ In June 2017, only 21% of all KiwiSaver members were in a default scheme.

selecting default providers are investment capability, corporate strength, administrative capability, track record, stability, and fee levels. The 2014 tender also included a new criterion which requires providers to offer investor education to default members. In Chile, the tender only focuses on the fee charged to plan members.

86. Tender mechanisms are effective at driving average fees down but heterogeneity may persist across providers. In Chile, fees are charged on the salary. The weighted average fee charged to plan members has declined since the tender mechanism is in place, from 1.49% of salary in 2009 to 1.19% in 2017.¹⁴ For a typical NZD 7 000 balance in KiwiSaver default funds, the average total annual fee declined from NZD 69 for the period 2007-2014 to NZD 56 for the period 2014-2021. However, fee differences across pension providers are significant, especially in Chile. In January 2018, fees charged to plan members varied from 0.41% of salary to 1.48%. Since the tender mechanism has been in place, most pension providers have kept their fees at high levels or just moderately reduced them. Therefore, providers not winning the tender do not seem to feel pressure to reduce their fees. This may be due to the fact that inertia keeps plan members with their provider and prevents them from switching to cheaper providers.

87. Tender mechanisms need to include a range of criteria to be truly effective, not just fee levels. In Chile, the last two tenders were won by Planvital, the provider that was initially the most expensive; it reduced its fees from 2.36% to 0.47% of salary to win the 2014 tender. There are concerns that this provider may have offered a fee that is insufficient to cover its operating costs, increasing the solvency risk of the firm and compromising the quality of the services offered to members, including fund returns. This predatory pricing may also explain why the number of providers participating in the tender declined from four in 2010 to only one in 2016 and none in 2018. In January 2018, Planvital announced that it will increase its fees to 1.16% of salary as of August 2018, confirming that the previous fee level was not viable. In New Zealand, the government uses a range of criteria to evaluate the offers on top of fee levels, including the provider's organisational and investment capabilities. The number of default providers increased from six to nine between the two tenders, suggesting no predatory behaviour.

88. Tender mechanisms can also be used to increase financial skills among plan members. In New Zealand, default providers have to deliver investor education to their members so that they can make an active fund choice.¹⁵ Their members are those who did not choose their KiwiSaver provider and may be in greater need to improve their financial knowledge. Default providers have to educate their members by informing them about the KiwiSaver scheme as a whole, as well as helping them make appropriate investment choices given their individual circumstances. The different default providers have proposed different approaches to member education, including proactive communication campaigns, seminars, financial advice and various online tools for members.

¹⁴ Fees are weighted by the number of participants in each pension provider in August of each year.

¹⁵ Active fund choice includes switching out of the provider's default fund into another of the provider's funds, or actively choosing to remain in the default fund.

Enhancing disclosure

89. Enhanced disclosure primarily aims at encouraging plan participants to react to differences in cost and fee levels. The Danish government-backed site www.pensionsinfo.dk provides individuals with comprehensive information on their own pension accounts including direct and indirect administration and investment costs, and past returns. The 2015 Communications Act in the Netherlands requires schemes to provide standardised information to their members. Individual pension statements in Mexico include information on fees paid by the worker and compare net-of-fees returns across pension funds. In the United States, participant disclosure regulation 404(a) requires plan sponsors to ensure that participants and beneficiaries receive sufficient information on fees, expenses and performance to make informed investment decisions.

90. Changing the charge structure can facilitate comparisons between pension providers. Some countries replaced their mixed fee structures (usually with fees on both assets and contributions) with a single, asset-based fee. This is the case for example in Mexico (2008) and Costa Rica (2011). Avoiding mixed fee structures can contribute to disclosure efforts by making it easier for participants to compare offers. As a complement to a single charge structure, some countries have introduced more direct controls over pricing, such as caps on fees.

91. The main limitation of disclosure-based initiatives is that pension statements and information websites do not always succeed in prompting members' action regarding their retirement savings. This is particularly the case for people with low financial knowledge. Indeed, as people do not always have a good understanding of the effect of compounding, they may not realise that small differences in fees (a few basis points) may translate into large differences in assets at the end of the accumulation period. In addition, while greater transparency and more straightforward comparisons should make it easier for plan participants to switch providers, switches may not always occur in the intended direction. Calderón-Colín, Domínguez and Schwartz (2008^[53]) indeed show that in Mexico, instead of strengthening competition through lower fees and higher returns for the workers, switching resulted in lower pensions for more than half of workers. Between 2001 and 2014, the majority of the workers who switched did so to a pension fund providing a lower net return (OECD, 2016^[41]).

6. How to invest pension contributions

How behavioural biases and low levels of financial knowledge affect the choice of the investment strategy?

92. In DC pension arrangements, participants usually bear the consequences of their investment decisions. When making investment decisions, people are confronted with a complex sequence of choices. To start with, they have to decide whether to remain invested in the default option. If not, they then have to decide in how many funds to invest, in which funds to invest and finally what percentage to invest in each fund. If participants behave as predicted by economic theory, such responsibility would be welfare-enhancing as members would invest and hold a portfolio of financial assets with a risk-return combination consistent with their investment horizon, degree of risk aversion and the portfolio of other assets they hold. This assumes that members have the knowledge to exercise choice and that their choice is not distorted by behavioural biases.

93. However, individuals lack good financial knowledge and are prone to various behavioural biases that can have an impact on investment choice (Tapia and Yermo, 2007^[54]; OECD, 2017^[55]), including:

- Choice and information overload: Contrary to popular belief, more choice is not always better. Individuals can be prone to choice overload and therefore fail to act. For example, Iyengar, Jiang and Huberman (2004^[9]) find that participation rates in 401(k) pension plans decline as the number of fund option increases.
- Time-inconsistent preferences: Risk aversion and preferences vary over time, complicating optimal investment plan design. In addition, inertia and procrastination affect individuals' decisions, leading to sub-optimal choices. For example, Benartzi and Thaler (2002^[56]) show that plan participants rarely rebalance their investment portfolios after joining plans and have relatively weak preferences for the portfolio they elect.
- Heuristic decision making: Faced with complex decisions, people rely on simple rules of thumb or heuristics that serve to reduce the complexity of the options to be assessed. Benartzi and Thaler (2001^[57]) show evidence that participants make decisions that seem to be based on naive notions of diversification, such as the "1/n heuristic". The rule simply allocates assets evenly among the n options offered in the retirement savings plan. The authors show that reliance on the 1/n heuristic can be costly, as individuals enrolled in plans with predominantly stock funds will find themselves owning mostly stocks, while those in plans that have mostly fixed income funds will own mostly bonds, independently of their degree of risk aversion.
- Framing effects: Many participants are influenced by the way in which saving and investment issues are presented or "framed". For instance, Bateman et al. (2016^[58]) show that individuals appear to focus on asset allocation information at the expense of risk and return information when comparing different investment options. When asset allocation information is not shown to participants, they revert to a risk-return trade-off. Moreover, if a number of different investment options are presented, issues such as numbering and the order in which they appear will affect choice, as people may not bother going through the whole list.
- Overconfidence and over-extrapolation: A large experimental literature finds that individuals are usually overconfident (Tapia and Yermo, 2007^[54]). Overconfidence is the tendency for people to overestimate their knowledge, abilities and the precision of their information. Over-extrapolation occurs when people make projections on the basis of only a few observations, implicitly believing that these observations suggest real patterns or trends (e.g. assuming an investment will have the same performance in the future as in the past). These biases mean that investment decisions may become based on conjectures rather than fundamental value.
- Loss aversion: People often strongly prefer avoiding losses to acquiring gains. This may result in under-diversified portfolios with an over-reliance on fixed income.

Effective approaches to facilitate the choice of the investment strategy

94. In order to account for the implications of behavioural biases and low levels of financial knowledge on investment decisions, effective approaches to facilitate the choice of the investment strategy include simplifying choice by reducing the number of available

investment options, establishing appropriate default investment strategies, and providing financial advice and financial education.

Reducing the set of available investment options

95. In DC pension arrangements, policy makers need to find the appropriate balance between a wide range of individual choices on the one hand, allowing people to take into consideration their individual risk profiles and preferences, and the simplicity of a restricted menu of choices on the other hand.

96. Some countries give priority to individual choice and allow a large number of investment options, complemented with default strategies for those unwilling or unable to choose. For example, in Sweden, individuals can choose up to five funds from the 830 registered with the Swedish Pensions Agency at the end of 2015. If an individual decides not to choose his/her own funds, the contributions go to the publicly-managed fund AP7. Most Swedes like having fund choice within the premium pension system, in particular younger ones (Swedish Investment Fund Association, 2013^[59]). Despite this, only 1% of those who joined the pension system in 2016 declined the default fund and chose their own portfolios (Cronqvist, Thaler and Yu, 2018^[60]). In Australia, some funds propose more than 1 000 investment options.

97. By contrast, many countries in Latin America and Central and Eastern Europe allow participants to choose only from a restricted number of investment options. For example, participants can choose from five pension funds in Chile and Mexico, four funds in Estonia and three funds in Latvia.

98. Reducing and simplifying investment options can improve members' outcomes. Keim and Mitchell (2017^[61]) examine how employees in a large U.S. firm changed their fund allocations when the employer streamlined its pension fund menu and deleted nearly half of the offered funds. The authors examine plan participants' investment choices prior to and after the streamlining event and evaluate what happened to participant fund allocations, risk exposure, and costs as a result of the change. Participants holding the deleted funds could either i) reallocate their money to funds kept in the list in advance of the deadline, or ii) be defaulted into the age-appropriate target date fund. Post-streamlining, participants who held the deleted funds adjusted their portfolio, ending up with fewer funds, significantly lower within-fund turnover rates, and lower expense ratios.

Establishing appropriate default investment strategies

99. Default investment strategies address the problem that some people lack the knowledge and/or the commitment to design and manage their own portfolio.

100. The default investment strategy may be designed according to a balanced investment strategy that keeps the same asset allocation throughout the investment period or following a life-cycle strategy.

101. In some countries, such as Estonia, Latvia and New Zealand, by default all contributions are invested in the most conservative strategy (no equity exposure) until the participant designates an alternative pension fund. The reasoning for such regulations may be that those unable to make choice may also be the most risk averse. It also gives members time to think about the strategy that best fits their needs. Thus, pension funds invest contributions in a fixed income portfolio under the expectation that at some point in the future, participant will make their own appropriate investment choice.

102. The drawback with such a strategy is that it could be inconsistent with two financial principles. Indeed, conservative investment strategies account neither for the existence of an equity risk premium, nor for the principle that younger individuals are able to assume greater risk than older individuals because the former have more time to recover from periods of low returns and have more human capital. Moreover, people are prone to inertia and procrastination. If members are passive decision makers, the default option selected by policy makers or employers becomes the de facto member's choice. For example, Burke, Hung and Luoto (2017_[62]) find that only 17% of newly hired U.S. employees participating in their employer's automatic enrolment scheme select a different investment portfolio than that specified by their plan's default settings within the first four years of participation. Some people may therefore remain with a conservative investment strategy for the entire accumulation period.¹⁶

103. The main trend in recent years is to establish a life-cycle investment strategy as the default. This allows younger individuals to take more risk and to reduce risk as people age. As members get older, their pension assets are invested in a more conservative investment strategy, reducing the risk of large losses in their account as the retirement age approaches.

104. There are three main models to design life-cycle strategies. Some countries follow a model based on multi-funds, with members assigned to one of the funds by default according to their age (e.g. Chile and Mexico). Members' assets are transferred from one fund to the next when they reach certain age thresholds. In some other countries (e.g. Hong Kong, China and Sweden), the default life-cycle investment strategy uses a mix of funds, the proportions of which evolve as members reach a certain age. Finally, target date funds are popular in the United States (Vanguard, 2017_[21]). Portfolio allocations are based on an expected retirement date, with allocations growing more conservative as the participant approaches the fund's target date. The glide path is usually smoother than with the multi-funds model.

105. Although life-cycle investment strategies may alleviate the impact of investment risk, they do not necessarily provide the best investment outcome for the individual in all circumstances. Such strategies provide protection for those close to retirement in the case a negative shock in financial markets happens just before retirement, as the amount of assets allocated to risky investments falls as people get closer to retirement. OECD work shows that life-cycle strategies tend to outperform fixed-portfolio strategies when a shock to equity markets occurs just before retirement (Antolin and Payet, 2011_[63]). However, life-cycle strategies are not a panacea. The positive impact of life-cycle strategies dwindles as shocks to equity markets occur further from retirement age. Indeed, people with a fixed portfolio could have an opportunity to recover should returns to equities become positive in the remaining years before retirement, while with a life-cycle strategy, the automatic reduction in equity exposure reduces the chances for recovery.

Providing financial advice and financial education

106. Financial advice should help members tailor their investment strategy to their needs but may be ineffective when it is unsolicited. For example, Hung and Yoong

¹⁶ This fear may not be valid in every country however. For example, most participants in the Latvian mandatory funded pension scheme make an active investment choice getting out of the default conservative plan.

(2013^[64]) show that individuals who actively solicit financial advice perform better, making fewer “portfolio mistakes” (i.e. having overly conservative portfolios, overly aggressive portfolios and/or under-diversified portfolios) than those not receiving advice. When individuals can choose whether or not to receive financial advice, those with low financial knowledge are more likely to take it. However, individuals who receive unsolicited advice disregard it almost completely and are not doing any better than those not receiving advice, making as many portfolio mistakes.

107. Financial education to individuals making investment decisions can support and encourage long-term savings and investment, and help individuals feel more confident when investing their pension contributions. OECD (2017^[55]) offers a policy framework to develop and implement national initiatives on investor education. It aims to remove the potential obstacles that may prevent individuals from participating in financial markets (e.g. lack of trust in the financial system, perceived participation costs) and to induce behavioural change (e.g. inappropriate risk-taking, excessive risk aversion). Investor education can also prepare individuals to understand financial advice and to better interact with financial advisors. IOSCO and OECD (2018 forthcoming^[65]) also presents how behavioural insights can be used to develop financial education interventions.

7. Choice of the post-retirement product

How behavioural biases and low levels of financial knowledge affect the choice of the post-retirement product?

108. One of the key goals of pensions is to provide a lifelong stream of income after retirement. DB plans usually pay pension benefits in the form of immediate life annuities. By contrast, in DC pension arrangements, people may have to choose between different post-retirement products. The biggest risk people face during retirement is to run out of money while they are still alive. Unlike lump sums and programmed withdrawals, life annuities guarantee a payment for the entire lifetime of the retiree and therefore protect them from longevity risk. Behavioural biases and low levels of financial knowledge however affect how people perceive annuities. They also affect the decision to get a lump sum and the way in which people may draw down their savings when choosing programmed withdrawals.

109. The effect of financial knowledge on annuity demand is unclear (Brown, 2009^[66]). For example, Agnew et al. (2008^[67]) find that, conditional on education, individuals with high levels of financial knowledge are significantly less likely to choose annuities. This may be due to the fact that more financially knowledgeable individuals are over-confident in their investment skills, perhaps leading them to believe that they can “do better” than an annuity by investing on their own. Brown, Casey and Mitchell (2008^[68]) find that more highly educated individuals are less likely to annuitise. However, conditional on education, they find that more financially knowledgeable individuals are more likely to choose an annuity. In both studies, financial knowledge is measured based on the capacity to correctly answer three basic questions on interest compounding, inflation and risk diversification. However, the decision to annuitise may be linked to other types of financial knowledge, such as understanding the implications of longevity on retirement outcomes.

110. Loss aversion may lead people to dislike annuities. People may not like to give away a large amount of money (the annuity premium) for a stream of small amounts (the annuity payments). Moreover, people tend to view annuity providers as institutions taking

their money away. It is important to individuals to keep control over their assets and investment strategies, in part because of fears of illiquidity. In addition, people feel that they lose money if they die early. Finally, there is also the issue of insolvency risk. People wonder whether the institutions taking their money now for promised pension payments in 20-30 years will still be around over that time.

111. Improving individuals' awareness of the risk of living to an old age does not necessarily increase the preference for annuities. While the expectation of a longer life has been shown to be related to the increased preference for annuities, individuals also tend to underestimate their expected survival. Mosher (2015^[69]) assessed whether improving individuals' awareness of the risk of living to an old age could improve these estimates and lead to a higher preference for annuities. Results showed that while subjective life expectancies may be influenced by this information, it does not affect the preference for life annuities and may even reduce the take up of annuities. A potential explanation for these results is that individuals with higher subjective life expectancies also have a higher risk tolerance because they have a longer investment horizon. In addition, increasing individuals' awareness of longevity risk may also increase their perceived need for liquidity for future healthcare costs, reducing their preference for illiquid life annuities.

112. Framing also influences the way people perceive annuities. Brown et al. (2013^[70]) argue that life annuities are more attractive when presented in a "consumption frame" rather than in an "investment frame". The two alternative frames, which are just two representations of the same financial choice, may lead to different perceptions of gains and losses. The consumption frame presents financial products by highlighting consequences for consumption in retirement. The investment frame focuses instead on the risk and return features of the financial products. In an experiment, the authors randomly assigned people over the age of 50 to choose between different financial products using the consumption or the investment frame. The financial products include life annuities, savings accounts, bonds and fixed-term annuities. The results show that life annuities are preferred when financial products are presented in a consumption frame. By contrast, when these same products are presented in an investment frame, savings accounts and other financial products are strongly preferred to annuities.

113. Financial literacy may also affect withdrawal behaviour. For example, In Turkey, about one-third of participants close their individual pension account before achieving full retirement entitlements and withdraw all of their assets, despite financial penalties.¹⁷ Yildiz, Karan and Bayrak Salantur (2017^[71]) find a negative relationship between financial literacy and withdrawal probability. In the United Kingdom, individuals may not understand the consequences of withdrawing funds from their pension account in terms of taxes paid. Since 2015, individuals aged 55 and over can access their DC pension savings as they wish. The reform allowed the Treasury to collect far more taxes than anticipated.¹⁸

¹⁷ Early withdrawal is penalised by a higher tax on returns and the foregone benefit of the 25% government matching contribution.

¹⁸ The measure was initially estimated to raise around GBP 0.3 billion in 2015-16 and GBP 0.6 billion in 2016-17, but it has actually raised far more than anticipated: GBP 1.5 billion in 2015-16, while the latest estimate for 2016-17 is GBP 1.1 billion. The Treasury now expects the measure to bring in GBP 1.6 billion in 2017-18.

114. As programmed withdrawals do not provide full coverage for longevity risk, the withdrawal rate determines the amount of longevity risk left with the individual. On the one hand, withdrawing too much too early causes individuals to face an increased risk of outliving their pension assets. On the other hand, withdrawing too little may lead people to reduce the standard of living that they can enjoy in retirement. In Australia for example, people are required to withdraw a minimum amount every year under programmed withdrawals, from 4% of assets under age 65 to 5% between 65 and 74 years old and up to 14% at age 95 and older. According to the Australian Government (2016^[72]), a majority of individuals drawdown account-based pensions at or close to the minimum rates. There is the concern that individuals are self-insuring against longevity risk at a high cost when measured in terms of foregone income.

115. Traditional rules of thumb to draw down pension assets in programmed withdrawals may not provide optimal outcomes. People adopt simple rules of thumb for drawing down their assets that are relatively simple to follow. Some retirees leave the principal in their retirement accounts untouched and spend only the investment income. This strategy may be desirable for those who want to leave a bequest but it reduces retirement consumption. A second drawdown strategy is to divide each year all financial assets by the remaining life expectancy, as predicted by life tables. However, people living beyond their cohort's life expectancy will outlive their resources. A third strategy is the so-called "4-percent rule" advocated by some financial planners, under which the retiree each year withdraws 4% of the initial amount of assets accumulated at retirement. However, this strategy lacks flexibility, as the withdrawn amounts do not adjust to the performance of the portfolio. Sun and Webb (2012^[73]) build an optimal drawdown pattern that maximizes the expected utility of consumption during retirement and compare it to the three strategies described above. They find that the three strategies underperform this optimal drawdown pattern, with the life expectancy strategy being the closest and the 4-percent rule being the farthest from the optimal.

Effective approaches to facilitate the choice of the post-retirement product

116. The design of the pay-out phase needs to be determined in coherence with the overall structure of the pension system. The need to annuitize DC pension pots depends on how much is already received as an annuity from occupational DB plans and public PAYG pensions. Moreover, allowing lump sum withdrawals can help people cover expenses or reimburse debt and thereby improve their financial situation in retirement. The design of the accumulation and pay-out phases also needs to be internally coherent. For example, flexibility in the pay-out phase may not make sense when participation is mandatory.

117. Policy options to help individuals transforming the assets accumulated in their pension account into a retirement income include promoting the demand for annuities and facilitating product comparisons.

Promoting the demand for annuities

118. When mandating annuities is not an option, the role of annuities in the pension system may still be strengthened to help people cope with longevity risk by establishing them as defaults, providing financial incentives and fostering product design innovation.

119. Annuity take-up could be increased by establishing this post-retirement product as the default. For example, Gazzale, Mackenzie and Walker (2012^[74]) show that offering an immediate life annuity as the default option, with a lump sum as the alternative, increases

the demand for annuities. While only 28% of participants in their experiment chose an annuity when the default was the lump sum, 51% did so when the default was the annuity. Defaulting plan members into an annuity would increase longevity protection.

120. Financial incentives can be used to encourage individuals to purchase annuities. For example, both the Czech Republic and Estonia incentivise people to annuitize their pension income through a more favourable tax treatment for annuities as compared to programmed withdrawals (OECD, 2015^[75]). In Turkey, the government promotes annuities by paying a subsidy equal to 5% of the account balance at retirement to participants in the automatic enrolment scheme purchasing an annuity paid over at least 10 years. In Denmark, a tax reform in 1999 reduced the deduction that high-income workers could take for contributions to “capital” pension accounts, which are accounts that provide lump-sum payments at retirement. That reform however left unchanged the treatment of contributions to accounts that provide annuity payments. Chetty et al. (2014^[76]) show that individuals in the top income tax bracket reduced significantly their contributions to capital pensions following the reform, redirecting nearly all that saving to annuity pension plans and other savings accounts.

121. Product design innovations can help overcome the low demand for traditional annuity products. OECD (2016^[77]) provides an overview of the different types of annuity product, describing the guarantees that they offer. It shows that there is a trend towards more flexibility and risk-sharing in the design of annuity products. For example, variable annuities provide flexibility in the sense that, although a minimum rate at which the accumulated funds can be converted into an annuity is guaranteed at issue, annuitization is not mandatory and the policy may be surrendered instead. Risk-sharing features can be found in participating life annuities for instance. These annuity products generally offer a minimum guaranteed level of income to the annuitant, but give additional bonus payments depending on actual return or profit measure. The Australian government is developing a new framework for Comprehensive Income Products for Retirement (CIPRs). This framework would aim to facilitate the development and take-up of products that better manage longevity risk through risk pooling.

122. A product that strikes a balance between flexibility and protection from longevity risk could be established as a default post-retirement product. For example, OECD (2012^[45]) advocates the use of a combination between programmed withdrawals and a deferred life annuity bought at the time of retirement that starts paying at old ages (e.g. 80-85). This type of combination may be appealing to individuals. According to Gazzale, Mackenzie and Walker (2012^[74]), when participants in an experiment were offered a deferred annuity as an alternative to the default lump sum, 60% selected the annuity.

Facilitating product comparisons

123. To overcome inertia, people should be encouraged to shop around before choosing their post-retirement product. In the United Kingdom for example, around 60% of annuity sales are being made to firms’ existing members (Financial Conduct Authority, 2017^[78]). In order to improve competition, the Financial Conduct Authority introduced new rules requiring providers to give members information to encourage shopping around in the annuity market. As of 1 March 2018, firms are required to provide information about the amount used to purchase the proposed annuity, whether the annuity is single or joint life, whether payment is in advance or in arrears of the start date, whether the income paid by the annuity is guaranteed for any period and whether the income will increase in line with inflation or some other specified rate. The document also gives the

provider's own quote and explains how to shop around, encouraging use of the Money Advice service.

124. The burden of shopping around can be further reduced by introducing a platform where people can directly compare offers from all providers for different post-retirement products. In Chile, the Online Pension Consultation and Bidding System (Sistema de Consultas y Ofertas de Montos de Pensión, or SCOMP) allows members with sufficient accumulated balance in their individual DC account to see the bids from all insurance companies (for annuities) and pension funds (for programmed withdrawals) in one place. Search costs are significantly reduced as future pensioners simultaneously receive and compare a wide range of post-retirement options from all providers in the market. There is no need for individuals to visit insurance companies and pension administrators to get an offer. In addition, all offers are standardised, facilitating the comparison by individuals. This system therefore lowers the risk that, because of inertia, future pensioners remain with their current pension administrator even though better offers may be available from other providers.

125. Pension advisors still have a role to play in a platform system. Staňko and Paklina (2014^[79]) show that, during 2012, 72% of individuals who consulted the SCOMP and made their request through a pension advisor accepted the best bid. It was only 26% for those who made their request through an insurance company. Although the system provides individuals with a document showing all possible alternatives of post-retirement products and bids, understanding that information may still be difficult for the average pensioner. Pension advisors can fill the knowledge gap and facilitate decision-making.

126. A platform comparing post-retirement options and bids can increase competition and lead to better outcomes for individuals. Morales and Larraín (2017^[80]) find that the SCOMP improved competition among providers. Between 2001 and 2008, annuity payments raised by 15%. Both individuals and providers have access to all bids simultaneously, giving transparency and reliability in the post-retirement option selection process, generating competition among bidders, and allowing individuals to make a decision based on comparable information. However, there is a concern that insurance companies are not giving their best offers through the SCOMP, because members can request external bids (i.e. insurance companies make an offer outside the system), thereby reducing transparency and potentially competition.

8. Conclusion and policy guidance

127. Given the growing importance of funded pension arrangements, and in particular DC pensions, in people's future retirement income in many countries, policy makers increasingly recognise the need to help people with their retirement planning. Planning for retirement is likely to require more financial knowledge and skills for people covered by funded private pension arrangements rather than PAYG public pension arrangements; personal pension plans rather than occupational plans; and DC schemes rather than DB schemes.

128. This document has argued that behavioural biases and low levels of financial knowledge can undermine people's ability to take action and make appropriate decisions for their retirement at all stages of their lives. It has then assessed approaches implemented in different countries to improve the design of funded pension arrangements through motivating or facilitating the appropriate behaviour by individuals. These

approaches complement general financial education policies, in particular those targeting the youth that will improve overall levels of financial literacy over time.

129. In this context, effective approaches to improve retirement incomes can be divided into five categories: automatic features, default options, simplification of information and choice, financial and non-financial incentives, and financial education.

130. Automatic features are increasingly used to increase participation in and contributions to funded pension arrangements. For example, automatic enrolment and automatic escalation of contributions harness the power of inertia to keep people saving for retirement. These policies maintain individual choice by allowing people to opt-out.

131. Default options help people who are unable or unwilling to choose a pension provider, an investment strategy or a post-retirement product. The default option usually implies lower risks for individuals. However, default options may not be optimal for everyone failing to make a choice given different needs and preferences.

132. People can make better choices if the decision-making process is simplified. This can be achieved through the development of web applications (e.g. voluntary contributions), the provision of a reduced set of options (e.g. investment strategies), better disclosure of comparable information (e.g. cost information) or the facilitated comparison of options (e.g. bids by providers for post-retirement options).

133. Financial incentives harness individuals' tendency to respond to immediate gratification to make them save for retirement. They can take the form of tax incentives (more favourable tax treatment compared to other savings vehicles) and non-tax incentives (matching contributions and fixed nominal subsidies). Non-financial incentives in the form of attractive product features (e.g. early access to funds) can also be provided and encourage participation.

134. Finally, financial education plays an important role in supporting individuals to make appropriate decisions, as set out in the OECD Recommendation on Good Practices for Financial Education Relating to Private Pensions (OECD, 2008^[81]). As people tend to focus on salient information, making sure that important information related to retirement saving is emphasised can improve decision making. This information can be conveyed through pension statements, financial education seminars and financial advice.

135. Based on the analysis of different approaches used in various countries to improve retirement incomes in the context of behavioural biases and low levels of financial knowledge, the following policy guidelines could help policy makers improve the design of funded pension arrangements.

136. **Countries aiming at high participation in funded pension arrangements could introduce a national mandate for private pensions.** Compulsion is the simplest, less costly and most effective way to reach high and uniformly distributed participation rates. Automatic enrolment is a second-best option, where all employees not already covered by an occupational pension plan could be enrolled by their employer in a new scheme with the possibility to opt out. That scheme should not compete with already existing provision to avoid creating incentives for employees to opt out.

137. **Self-employed and informal workers could be encouraged to voluntarily join the mandatory or automatic enrolment scheme by offering easy access and financial incentives.** Self-employed and informal workers could be nudged into the same scheme into which formal employees are enrolled, with the same incentives (apart from any employer contribution).

138. **Using default options for the contribution rate, the pension provider, the investment strategy and the post-retirement product can simplify decision-making.** Default options provide a reference point against which individuals can judge other options. They are essential for those who are unwilling or unable to make complex decisions with respect to retirement planning. Default options should however be carefully designed to avoid locking in passive individuals into sub-optimal arrangements.

- **Setting default contribution rates at a low initial level and implementing automatic escalation ensures that people may contribute enough to cover their needs in retirement.** Low default contribution rates can make it easier for people to accept compulsory enrolment, while in the context of automatic enrolment they can help reduce opt-out rates. However, low default contribution rates may prevent people from reaching an overall retirement income (including public pensions) that they will deem adequate. Automatically increasing contributions and linking these increases to pay rises can help people reaching their optimal contribution rate.
- **Countries could use tender mechanisms accounting for costs, quality of service and other variables to default new entrants that fail to choose a pension provider.** To avoid predatory behaviour, the tender should include a range of criteria reflecting the quality of service, not just fee levels. Only plan members not selecting their own provider would be defaulted into the winning entities. This should be combined with enhanced fee disclosure and members' education, as well as price regulation, to make sure that all individuals get good value for money with any provider.
- **A life-cycle investment strategy could be established as a default, while a limited set of available investment options should be provided for those able and willing to choose their own investment strategy.** For those unable or unwilling to track their investment and adjust it over time, a life-cycle investment strategy could be established as a default, allowing younger individuals to take more risk and to reduce risk as people age. Streamlined investment options on top of the default can facilitate individual choice when choice overload is considered as a serious issue.
- **Countries have to consider protection from longevity risk, flexibility and choice when designing the post-retirement phase.** A combination of programmed withdrawals, offering flexibility during the first years in retirement, with a deferred life annuity starting payments at the age of e.g. 85, offering protection against the tail risk of longevity, could be considered as an appropriate default post-retirement product. Facilitating shopping around different post-retirement products and providers, for example by using platforms to compare all options and bids, could enhance transparency, competition, and product innovation, as well as improve retirement income.

139. **Countries should continue efforts to educate and inform people to increase engagement with respect to pensions.** Workshops and seminars at the workplace, financial advice and personalised communication can prompt people's action and help them make decisions for their retirement at all stages of their lives. More standards, principles and guidelines on how to develop and implement financial education policies can be found at www.financial-education.org.

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