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The role of supplementary pension provision in retirement: designing private pensions to complement public pensions

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The role of supplementary pension provision in retirement: designing private pensions to complement public pensions

I. Introduction

1. Economic security in old age is an integral part of individual wellbeing. Pensions are intended to offer people this security once they can no longer earn their living themselves. Economic security could in principle be provided entirely by the public sector or entirely by the private sector. Pensions could be financed by the state from general revenues or earmarked levies, or they could be fully funded through individual contributions.

2. In practice, national pension systems combine public and private elements. Public pensions have typically been defined benefit (DB) in nature and financed on a pay-as-you-go (PAYG) basis.[1] The sustainability of such systems and the adequacy of the pensions they can provide are threatened by increased longevity and the declining ratio of actively employed contributors to retired beneficiaries. Many countries have therefore already introduced supplementary pensions or are considering doing so in order to reduce the pressure on public finances and raise the overall level of benefits that a participating individual will receive. Typically, supplementary provision takes the form of private, funded pensions.

3. The OECD encourages members to diversify the sources of retirement income and to strengthen the degree of funding in the overall pension mix through a combination of public and private provision.[2] Public and private pensions can be complementary: they offer different solutions for meeting the competing objectives of pension systems and have different capacities to cover the various types of risk that people face throughout their lives, both before and after retirement.

4. To exploit this complementarity and enhance the resilience of the pension system, policy makers need to understand how their national system addresses the objectives and risks inherent to pension provision, and the role that supplementary pensions are expected to play. They can then determine which features of pension design best support this role and whether these design features should be implemented via public or private pensions. For example, consumption smoothing could be achieved through raising contributions to either public or private arrangements, and the choice between the two may come down to practical issues of implementation. Redistribution, on the other hand, is easier to achieve through a mandatory public PAYG system.

5. The design features that policy makers should consider when optimising the combination of public and private provision are: whether participation in a pension scheme is mandatory or voluntary; whether benefits are backed by accumulated assets or paid from current contributions, and whether the scheme is defined benefit of defined contribution (DC).[3] A number of different outcomes are possible. Policy objectives, risk

[1] Most PAYG systems are DB; notional defined contribution (NDC) PAYG systems are in place in Italy, Latvia, Poland and Sweden

[2] OECD (2016a) Chapter 1

[3] *Op cit.*

tolerances, legacy systems and institutions, and fiscal and demographic constraints all vary across countries. Pension systems interact with other policy areas (e.g. with the tax regime or labour markets) resulting in changed incentives and economic distortions. Some design features may be too complicated to implement for either operational or structural reasons.

6. This document aims to provide a framework for assessing how private pensions can be designed in such a way as to complement public provision in meeting different objectives and sharing risks. It outlines the trade-offs faced by policy makers as they increase the role of supplementary pensions, and discusses the advantages and disadvantages of different features of public and private pensions in achieving sustainable and adequate pension provision. This document adds some further analysis on pension systems, replacement rates and transition and implementation considerations to the document "Designing Private Pensions to Complement Public Pensions" [DAF/AS/PEN/WD(2017)15] that was discussed at the WPPP in December 2017 and benefits from comments on that document received from delegates.

7. The structure of this report is as follows:

- Section 2 briefly describes the current status of pension systems across the OECD and the European Union, in terms of the role of public and private provision and the level of contributions to each part of the system.
- Section 3 outlines the various objectives and risks that pension systems must address and the broad roles that public and private pensions can play individually in meeting multiple objectives and sharing risks.
- Section 4 considers the need for supplementary pensions in addition to public pensions to achieve sufficient levels of consumption smoothing and how different elements of pension design can contribute to these objectives.
- Section 5 looks at interactions within pension systems and how this impacts both the complementarity between different pension designs and the potential transition costs of changing the public system or introducing supplementary pensions.
- Section 6 concludes and summarises the advantages and disadvantages of different combinations of public and private pension provision.

8. Delegates are invited to provide their views and comments on the research presented in this document and to consider whether to undertake further analysis into design decisions in public and private pension systems, such as:

- How can trade-offs between risk mitigation and individual incentives best be managed as private provision expands?
- How can transition costs best be contained

9. This document will be part of the 2018 edition of the OECD Pensions Outlook that will be launched during the WPPP meetings scheduled for 3-4 December 2018.

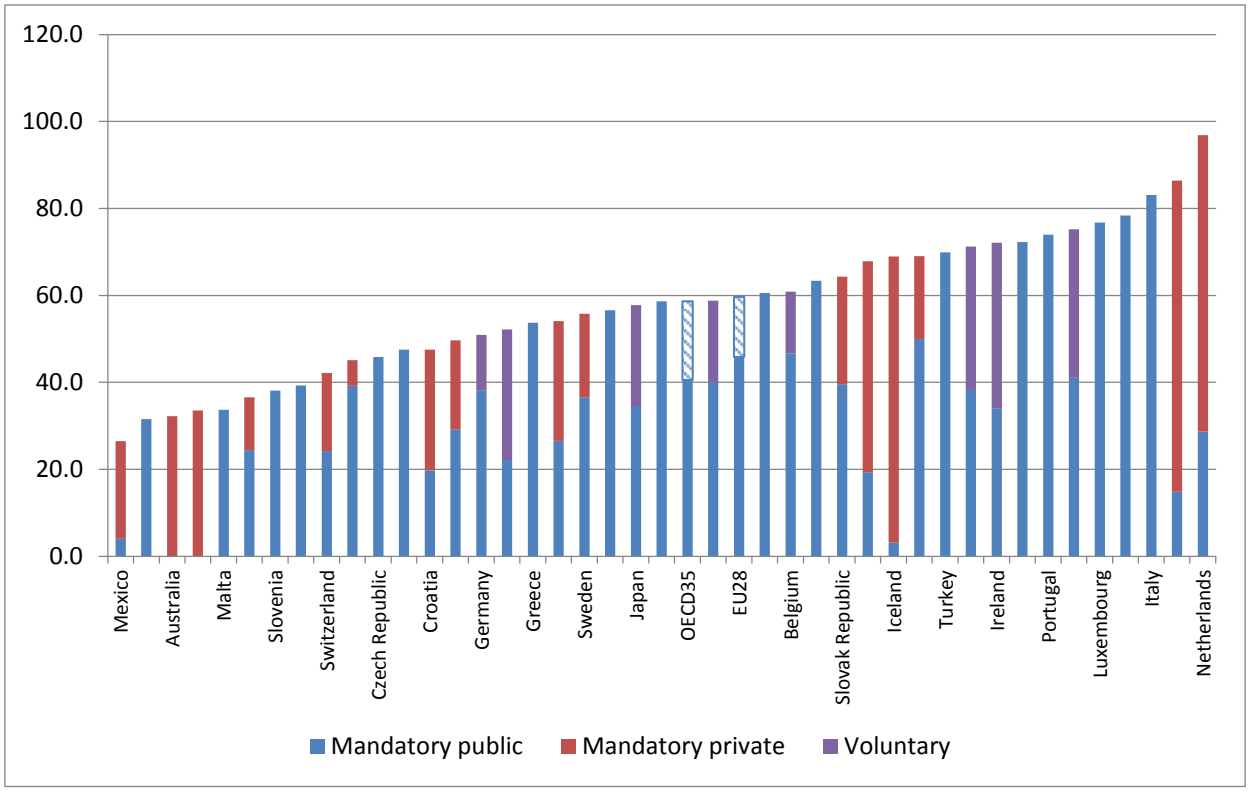
II. Public and private provision in national pension systems

10. The mix of public and private pensions and their relative importance in ensuring that individuals have adequate resources in retirement varies across economies. Figure 1 shows the theoretical future gross replacement rate from mandatory public and mandatory and voluntary private pension schemes based on the current rules of the pension systems in OECD and EU countries. The replacement rate measures the ratio of post-retirement to

pre-retirement income.[4] The outcomes shown in Figure 1 apply to an individual who enters the labour market in 2016, earns the average income and contributes for a full-career (around 30-40 years).

Figure 1. Gross pension replacement rates from mandatory public, private and voluntary private pension schemes

Percent of individual earnings, average earner



Note: Future gross replacement rates, full career worker, current legislation.
Source: OECD (2017)

11. Public pensions are expected to remain the most important source of pension income for current workers (Figure 1). Several countries have a fully public system, these provide gross replacement rates of between 32% (Poland) and 83% (Italy). Only Chile has a fully private system for average earners (low-income workers receive public pension benefits). Within the mixed systems, mandatory private pensions are the most important source of pension income in countries such as Denmark, Iceland, Israel and the Netherlands, while voluntary private schemes provide over half of the gross replacement rate in Ireland and the UK. In Switzerland, the public PAYG system aims to replace about a third of average earnings and this is supplemented by mandatory funded DB benefits for average and higher earners (workers earning below 40% of average earnings are not required to belong to a private scheme). In the US, the replacement rate provided by

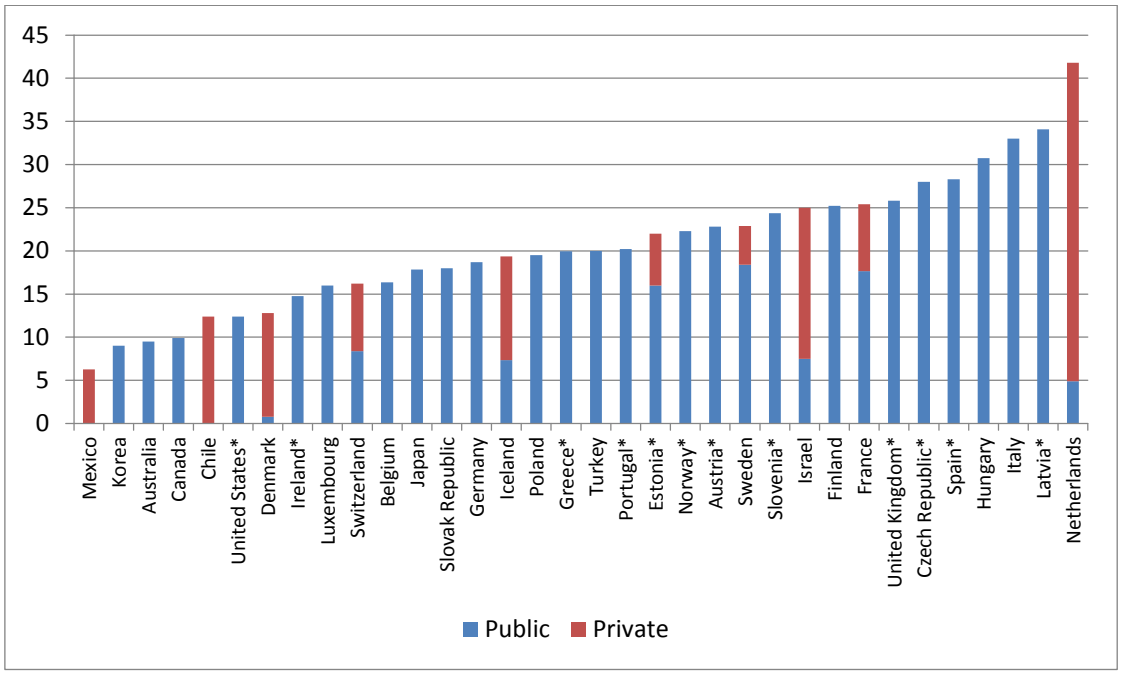
[4] We do not attempt to define "adequacy" in this document. Both the absolute level of benefits and the replacement rate for pre-retirement income that is considered adequate will vary by country and may be subject to political considerations.

Social Security is similar to the Swiss PAYG system for average earners at 35.2%, but it is topped up by income from voluntary funded pensions, primarily DC.[5]

12. The most common form of public pensions in OECD and EU countries is a PAYG, earnings-related arrangement. The level of the replacement rate depends on the level of contributions and the willingness and ability of policymakers to divert budgetary resources to make up any shortfall between revenues and payments. The fiscal strains of high replacement rates have led to reforms of PAYG pension arrangements that have affected pension adequacy and have increased responsibility on funded, private pensions to fill the gap.[6]

13. A high level of contributions to the public system can reduce the scope for private pensions, especially if there is a close relationship between the level of contributions and the level of benefits. Figure 2 shows the contributions to different sectors of national pension systems, where this data is available. If contributions to or benefits from public pensions are low, then supplementary pensions are more likely to be needed to ensure pension adequacy for individuals. Putting a greater reliance on private, funded pensions can improve the sustainability of the public system.

Figure 2. Mandatory pension contribution rates for an average worker in 2016



Note: * indicates social insurance contribution, including non-pension benefits.
Source: OECD (2017).

14. It is not only the level of entitlements from public pensions that determines the potential role of supplementary pensions but also their nature. Both DB and NDC models of PAYG pensions offer a lifetime guaranteed benefit that is linked to the level of

[5] Gross pension replacement rate of mandatory public system: 0.5x average earnings 44.4%; 1x average 35.2%; 1.5x average 29.1% (OECD 2015a)
[6] OECD (2015a)

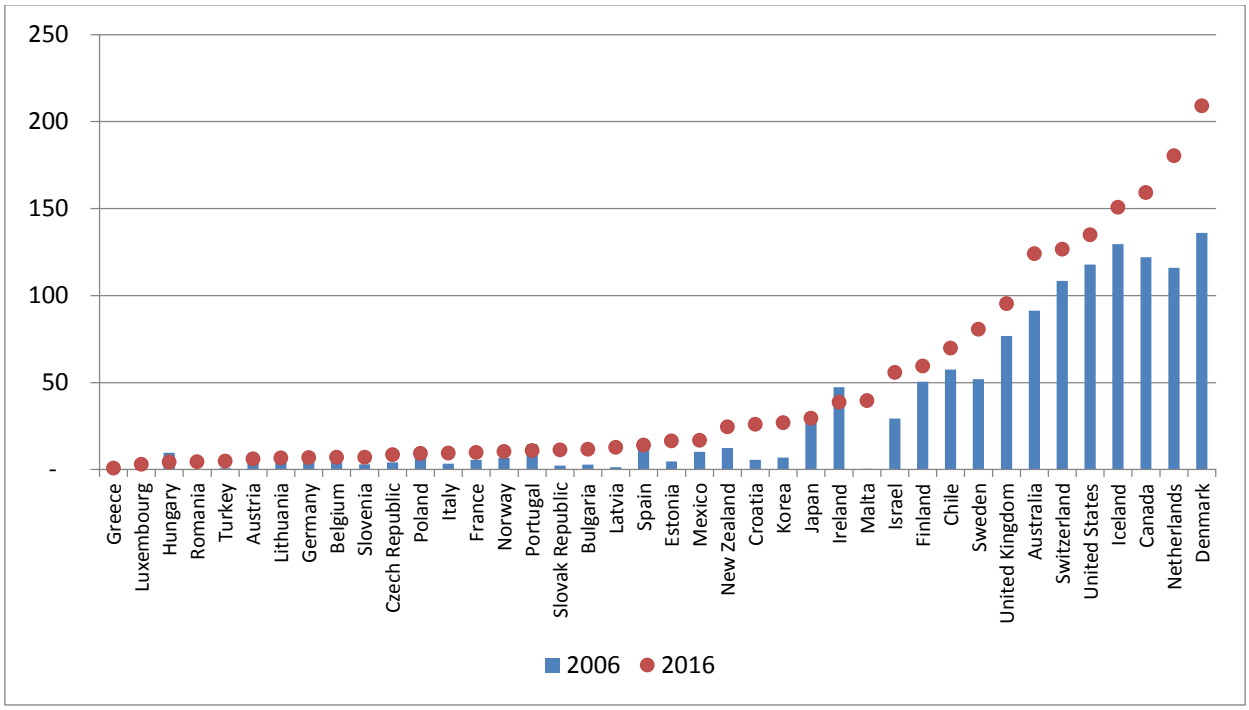
individual contributions: indirectly in the case of DB pensions and directly in the case of NDC. Funded public pensions, where they exist, typically provide only a small share of the overall public pension benefit and are mostly DC in nature.

15. Public pensions that provide an annuity-like benefit may create more scope for supplementary DC pensions that offer a less certain pay-out pattern. PAYG, DB public pensions may have built-in progressive or redistributive features such as benefit caps or differential accrual conditions. Supplementary pensions can reinforce or partially offset these elements, for example through the tax treatment of private pensions. To play an effective role in ensuring adequate income in old age, the design of supplementary pensions should reflect the full range of objectives of the overall pension system and the capacity of existing provision to meet those objectives and mitigate related risks.

16. The volume of assets in funded and private pension arrangements has grown steadily in the majority of OECD and EU countries in the last decade and half. Figure 3 shows that assets earmarked for retirement account for more than the overall economy is 7 countries. Total assets earmarked for retirement represent more than 51 per cent of the combined GDP all OECD countries.

Figure 3. Total assets in funded and private pension arrangements, in 2006 and 2016

As a percentage of GDP.



Source: OECD Global Pension Statistics.

III. Pension system objectives ad risks

17. Pensions systems have multiple and often competing objectives. They must provide financial security for retirees and they must be financially sustainable. They need to offer mechanisms for people to save enough to finance future consumption. They should be flexible enough to weather long-term demographic and economic change. They

may be used to deliver social and political goals such as poverty alleviation in old age and income redistribution across and within generations.

18. Pension systems must also provide insurance against multiple risks. Risks may be common to the system as a whole, such as macro-economic or financial market risks, or they may be related to the human capital of the individual. Operational risks exist in both public and private pension systems. Public and private pensions play different roles in addressing the objectives and risks of pension systems.

Multiple objectives

19. The primary objectives of pension systems are poverty relief and consumption smoothing. Protecting people from falling into poverty at the end of their working life is the preserve of the state across the OECD. Encouraging people to put money aside during their working lives in order to finance their consumption during retirement is done through both public and private pension arrangements.

20. Realising these objectives entails secondary goals: redistribution (from those who would otherwise have a big pension income to those who will have lower pension payments); coverage (how many people the system reaches, both as contributors and as beneficiaries); and preserving inter- and intra-generational equity (such that the benefits of one group are not maintained at the expense of another). Pension systems may have targets in terms of replacement rates and – increasingly – labour force participation (encouraging people to work and contribute beyond the age of retirement).

21. Poverty relief at a minimum level is provided through public pensions or other social benefits in all OECD member jurisdictions. This universal provision is part of the public safety net and cannot therefore be substituted by the private sector; the OECD recommends that it is financed from general taxation (OECD, 2016 Chapter 1). Universal basic benefits are also important contributors to the secondary objective of redistribution, although in some countries redistribution is limited by eligibility criteria. Individuals must contribute for at least a short period to be eligible for the basic benefit, which means that those who have never participated in the formal economy remain at high risk of old-age poverty. A number of countries, including Australia, Denmark and Chile, offer means-tested rather than universal basic benefits.

22. The objective of consumption smoothing is central to achieving pension adequacy. It can be achieved through either public PAYG or private funded pensions. Public PAYG schemes are the primary instrument for achieving consumption smoothing in Spain, Italy and France. Private funded arrangements are used in Australia (DC), Chile (DC), Switzerland and the Netherlands (both DB). Sweden uses a combination of public, PAYG, notional defined contribution (NDC), public funded DC and private occupational pensions which are increasingly moving from a DB to a DC structure. The common feature of all the arrangements that bear the primary responsibility for consumption smoothing is that they are mandatory.

23. Mandatory systems are also best placed to achieve the objective of high coverage. These can be public or private. The minimum basic public benefit will generate the highest levels of coverage, as individuals do not need a complete employment history to be eligible. Usually, such old-age benefits are pro-rated according to how well the individual meets the qualifying criteria for the minimum basic pension – such as a few years' contributions or residency – and are supplemented by other aspects of the safety net (e.g. housing allowance).

24. Mandatory, earnings-related pension arrangements can play an important role in achieving the coverage objective. However, private funded occupational plans will tend to focus on full-time employees and exclude groups such as the low paid, part-time workers and the self-employed. The UK's automatic enrolment programme is mandatory for employers and has enjoyed very low opt-out rates among employees. However, over 5 million people (21% of the total employed population) are ineligible for automatic enrolment because they do not meet the earnings or age criteria of the programme; women, ethnic minorities and disabled workers are disproportionately affected. A further 4.5 million self-employed workers are also excluded in the UK; the Chilean and Australian mandatory enrolment arrangements similarly do not cover the self-employed.[7] Malaysia extended its public funded DC scheme to part-time workers in 2010, coverage was thereby expanded to include a further 12 million people.

25. The redistribution objective is best achieved through the public PAYG, DB system. Within DB design, a number of components can be used to alter the balance between contributions and benefits, such as whether any floors and ceilings are applied to contributions and benefits, accrual rates and indexation. These can be exploited to redistribute across generations or to target specific groups within a generation. Redistribution is also possible within private funded DB arrangements; however, if one group makes a bigger claim on the assets of the scheme than is justified by its contributions, the difference will ultimately have to be made up by reducing benefits to other groups or by injections of funding from the sponsor. Conde-Ruiz and Gonzalez (2016) note that the minimum pension in Spain has grown faster than the minimum contribution limit since 1984, while the maximum pension has failed to keep up with increases in the maximum contribution, thus redistributing from higher to lower earners within each cohort. Funded, private pensions may be expected to support broader economic growth and accelerate the development of local capital markets by creating a pool of pension savings that must be invested. The role of funded, private pensions in economic development is likely to become more important still as countries place a higher priority on the objective of labour force participation. Funded pensions increase the incentives to work and save, and by encouraging older workers to stay in the labour market they can help to address concerns about the sustainability and adequacy of public, PAYG pensions in the face of demographic changes. Table 1 summarises how different pension designs can help to fulfil the various objectives of pension systems

[7] PPI (2017)

Table 1. Pension system objectives and pension design features

	Public pension Non-contributory	Public pension Contributory PAYG	Public pension Contributory Funded	Private funded pension Mandatory DB	Private funded pension Mandatory DC	Private funded pension Voluntary
Poverty relief	Most efficient method	Some through lifelong benefit	Some through lifelong benefit	Some through lifelong benefit	Not if exhaust resources	n/a
Consumption smoothing	No	Some, may be targeted to specific groups	Some, according to parameters	Inherent through lower wages	Most direct link savings/benefits	May divert other savings
Financially sustainable	n/a	Depends on parameters	Depends on link between benefits and contributions	Sponsor responsible	Individual responsible	Yes
Redistribution	Yes via tax system	Yes, depends on parameters	Yes, depends on parameters	Possible but not a goal	Not possible in individual DC	Not possible in individual DC
Inter-generational equity	Within tax system	In legacy systems, may mean lower guarantees for individuals	In legacy systems, may mean lower guarantees for individuals	Yes	Not possible in individual DC	Not possible in individual DC
Intra-generational equity	n/a	Possible	Possible	Possible	Not possible in individual DC	Not possible in individual DC
Benefit adequacy /replacement rate	Depends on policy/ fiscal implications	Depends on target (note potential sustainability issues)	Depends on target	Depends on parameters	Only non-binding target can be set	n/a
Labour force participation	n/a	May weaken incentives if DB	Depends on link between contributions and benefits	May be less suited to future labour market	Strong incentive	Limited incentive
Coverage	Universal	Only if participated in formal economy	Only if participated in formal economy	Tend to exclude lower paid	Tend to exclude lower paid	Usually for higher earners

Multiple risks

26. The growing role of funded pensions may however leave individuals more exposed to the risk of economic insecurity post retirement, especially if they are reliant on individual DC arrangements. Pension systems and the individuals that they cover face multiple risks. These include risks to the individual's ability to contribute to both public and private pension arrangements (labour market and social risks); risks to the capacity of those contributions to fund an adequate retirement (macro-economic, financial market and operational risks) and the risk that an individual will outlive his assets (longevity risk).

27. As the role of private pensions in meeting the objectives of pension systems grows, so must their role in addressing the risks. Their capacity to do so will depend on their design. For example, DB schemes are likely to be more efficient than DC schemes at insuring individuals against income shocks both before and after retirement, because they are able to exploit risk pooling (albeit on a smaller scale than public DB schemes). However, funded pensions are in general more vulnerable to macro-economic and financial risks than PAYG pensions.

28. Labour market risks – such as loss of employment and unfavourable earnings patterns – can have a significant impact on the rate at which pension rights are accrued or the rate at which pension assets are accumulated and the level of pension income received.

29. These risks can be offset by either public or private pension arrangements. Non-contributory basic benefits provide a back-stop security against the failure or inability to

pay into contributory schemes, or to pay enough to at least build up entitlements that are above the level of the basic benefit. Within public contributory schemes, employees are usually protected against some of the risk of disrupted career earnings: they may receive top-up contributions/accruals in certain circumstances (e.g. military service, parental leave), or a number of "bad years" may be excluded when their entitlements are calculated. The US Social Security system takes account of the best 35 years of contributions when calculating retirement benefits. Most Central and Eastern European funded public systems include protection mechanisms for periods of economic inactivity.[8]

30. A similar analysis applies to social risks, which include disability and lack of financial independence. The public non-contributory benefit provides a safety net for individuals who suffer an income shock either before or after retirement. All OECD countries offer additional disability benefits and usually some protection of the future retirement income of those whose working career is cut short by disability. These may be flat-rate or earnings-related.

31. These safeguards within public systems are a form of insurance, but because they are often funded outside the pension system they may not be recognised as such by individuals (they may be interpreted as entitlements). For example, in Sweden non-contributory individual credits to the PAYG system during spells of unemployment are allocated to the central budget line for unemployment costs.

32. Within private funded arrangements, the nature of the insurance may be made more explicit. It is compulsory to purchase insurance against social risks in Chilean individual accounts and (partly optional) life insurance is integrated within the Australian Superannuation system. Most DC schemes however do not provide cover against lost contribution periods, as it is expensive to insure such risks on an individual basis. Collective private schemes are better able to pool such risks and so provide insurance.

33. Macro-economic risks make it less likely that an individual will receive an adequate pension income. Low growth and productivity affect both public and private pension systems. They limit the fiscal capacity to fund non-contributory pensions and result in lower contributions to PAYG and funded schemes. It may well be difficult to raise contribution levels in both public and private schemes in a weak economic environment without reducing the pre-retirement consumption by too much compared to post-retirement consumption, especially for low earners. Low wage and productivity growth makes it harder to meet the promises embedded in DB arrangements, whether PAYG or funded.

34. Inflation reduces the future purchasing power of income put aside today for the purposes of consumption smoothing. Benefits in public PAYG schemes are usually indexed to price or wage inflation. The extent of indexation in funded DB schemes varies across the OECD: while automatic indexation is offered by few schemes in the USA, both benefits and accruals must be indexed to CPI in the UK, and pensions in payment are indexed to a minimum of CPI and a maximum of wage inflation in German *Pensionsfonds*. Indexation may threaten the sustainability of both PAYG and funded DB schemes – the Netherlands has introduced conditional indexation of occupational DB pensions to reduce risks to the funding levels of these schemes. Benefits in DC arrangements are less likely to be indexed but indexation can be introduced, as in Chile where life annuities must be linked to inflation.

[8] Kawinski et al. (2012)

35. Low interest rates pose a more immediate risk to funded pensions than to PAYG pensions. They can lead to lower pay-outs from funded DC schemes by reducing the returns on invested assets and lowering annuity values. They may also damage the sustainability of funded DB schemes as liability values increase.

36. Financial market risks similarly are more relevant for funded pensions than for non-contributory or PAYG arrangements. Retirement benefits in funded systems are financed by accumulated assets; financial market shocks can reduce the value of those assets. This will be particularly damaging if the shock occurs towards the end of the accumulation period, when the individual has less time to rebuild his savings before beginning to draw down his assets. Investment strategies such as lifecycle or target date funds can help to reduce volatility in investment performance but potentially at the expense of lower overall returns (the OECD Roadmap for the Good Design of DC Pension Plans recommends the use of lifecycle funds as the default strategy in DC plans).

37. Operational risks also principally affect funded systems, since excessive operating costs or badly-designed investment strategies will have a direct impact on the assets in a funded scheme. Ultimately, a funded scheme can go bust. However, just as public arrangements will almost certainly be bailed out by the government, lifeboats and bailouts can be put in place for the private sector. Germany, Switzerland, the UK, the USA and Ontario (Canada) all have pension guarantee schemes in place for the private funded DB sector.

38. In principle, publicly-managed pensions should be at less risk of being high cost than privately-managed schemes, because they can exploit economies of scale and simplified administration (thanks to less personalisation) and do not incur marketing costs. For example, the Swedish public funded DC scheme, the Premium Pension (PPM), introduced a clearinghouse model to control investment costs and has a monopoly over the provision of annuities. Private funded arrangements can take measures to reduce their costs: the four sector-based occupational schemes in Sweden have introduced their own clearinghouse systems. Policies have been introduced in many OECD countries to contain the costs of privately-managed DC pensions.[9]

39. Furthermore, publicly-managed arrangements may not necessarily be more efficient than private providers across their operations. Palmer (2008) reports that contributions to the PPM are not actually invested in the member's portfolio for up to 18 months, during which time they earn bond returns from the National Debt Office. Core Principle 5 of the OECD Core Principles of Private Pension Regulation specifies that investment decisions should be implemented in a timely manner.

40. Longevity risk is the risk that an individual will live longer than expected and so exhaust his resources. DB pensions, whether PAYG or funded, offer protection against longevity risk to individuals by providing a lifetime stream of benefits. However, this leads to issues of sustainability and inter-generational equity if a relatively smaller working population is required to support the pensions of a relatively larger retired population over a longer period. PAYG DB systems are the most vulnerable to demographic shifts that alter the ratio between the size of the cohort that is working and contributing and the size of the cohort that is receiving benefits paid for by those contributions.

[9] These are discussed in [DAF/AS/PEN/WD(2017)5]

41. Longevity risk within public arrangements can be reallocated more neutrally across generations by adjusting benefit levels and accruals. In Sweden and Germany, balancing mechanisms have been introduced whereby benefit levels are linked to demographic and economic developments, thus shifting a part of both macro-economic and longevity risk away from the state and onto individuals. Risk in an occupational DB scheme is ultimately borne by the sponsor although it can be spread amongst current workers, retirees, shareholders, future employees and taxpayers through adjustments to benefit levels, accrual rates, indexation and contractual terms. However, the rising cost of longevity insurance is leading sponsors to withdraw DB provision in favour of DC.

42. In DC schemes, the risk of outliving one's assets is borne by the individual, who has the choice of saving more, retiring later or spending less in retirement. A functioning annuity market would allow DC arrangements to guarantee their members a lifelong income, with annuity providers bearing some proportion of the longevity risk. As discussed in OECD (2016b), this will vary according to the discount rate used in calculating the annuity and whether the guarantee is issued before or at retirement.

43. Longevity and longevity increases differ substantially within a given population (OECD, 2016a Chapter 6). If annuity rates do not reflect these differences, annuities may favour higher earners in conflict with redistribution objectives. On the other hand, if annuities accurately reflect gender differences in longevity, they will offer less generous benefits to women who are already the most at risk from old-age poverty (they are less likely to have a full contribution history and more likely to be reliant on survivors' pensions).

44. Overall, the multiple risks that can affect pension systems pose the greatest threat to members of individual DC schemes because these impose a direct link between the value of accumulated assets and the level of retirement income. Collective funded and PAYG arrangements have greater scope for risk pooling and burden sharing but are also vulnerable in the event of lower contributions, lower returns on assets and higher claims. Table 2 summarises the exposure of different pension designs to different risks and highlights that the ultimate safeguard against the risk of old-age poverty is the universal basic public pension.

Table 2. Pension system risks and pension design features

	Public pension	Public pension	Public pension	Private funded pension	Private funded pension	Private funded pension
	Non-contributory	Contributory PAYG	Contributory Funded	Mandatory DB	Mandatory DC	Voluntary
Labour market risks	Full cover at basic level	Protection can be built in, e.g. for missed contributions	Protection can be built in, e.g. for missed contributions	Risk pooling possible	Expensive to insure on individual basis	n/a
Social risks	Full cover at basic level	Protection can be built in, e.g. for disability	Protection can be built in, e.g. for disability	Risk pooling possible	Can be built in e.g. Chile	n/a
Macro-economic risks	May affect fiscal capacity	Lower contributions	Lower contributions; cost of indexation	Contributions, indexation, sponsor health, annuity values	Contributions, annuity values Indexation less likely	Lower contributions
Financial market risks	n/a	n/a	Investment returns	Investment returns	Investment returns	Investment returns
Operational risks	n/a	n/a	May fail to exploit scale	Governance risks	Governance risks	Governance risks
Longevity risk	Full cover at basic level	Full cover at given level	Full cover at given level	Full cover at given level but move to risk sharing	Can be built in but at higher cost	n/a

IV. Pension arrangements for consumption smoothing

45. Consumption smoothing requires setting aside income today in order to spend it post retirement. The income that is set aside should not lose its value over time, so it should either accrue entitlements to future real purchasing power or be invested in assets that will increase in value. This can be achieved through either public or private pension provision, and through funded or unfunded pensions.

Pressures on PAYG systems

46. Many countries initially introduced public PAYG systems for consumption smoothing. However demographic changes mean that the number of retirees has grown faster than expected, while at the same time economic and market pressures have hit contributions into public systems and investment returns in funded systems, making it harder to finance benefits. PAYG pensions represent a significant fiscal burden in many countries. Across the EU, public expenditure on pensions represents over 10% of GDP.[10]

47. In response to these fiscal pressures, countries have reformed their PAYG systems, introduced funded pensions – either public or private – or done a combination of both (OECD Pensions Outlook and OECD Pensions at a Glance, *passim*). Sweden reformed its public PAYG system, moving from a DB structure to a mixture of notional DC and funded DC. This signalled that individuals would have to take more responsibility for ensuring that they had an adequate retirement income while leaving poverty relief with the state, which maintained a minimum pension guarantee of around 25% of the average wage financed from the general budget. Most workers are also covered by an occupational scheme, usually DC, and these benefits are exempted from

[10] European Commission (2018).

means testing for the guaranteed pension. The Swedish system provides a strong incentive to contribute to both public and private schemes for most groups of workers although the lowest paid will enjoy a high level of financial security from the minimum entitlements alone.

48. NDC may be a means for public PAYG pension arrangements to preserve some of the risk-sharing and insurance characteristics of DB while changing the accumulation structure to DC, creating more incentives for individual participation and improving fiscal sustainability. Individuals' contributions are credited to a notional account and the accumulated capital is converted into a lifetime annuity at retirement. Funding is on a PAYG basis. Contributions earn a notional interest rate linked to economic growth or wage growth. There is no intrinsic redistribution within cohorts in an NDC scheme but this can be created, for example by adding features such as offsetting contributions for missing periods, sick leave and survivors' insurance. As in a pure DC scheme, benefits adjust to economic and demographic developments: each cohort should be self-funding.

Funded versus unfunded pensions

49. Some countries, by contrast, do not have a public, earnings-related pension and have introduced private funded DC pensions as the primary vehicle for consumption smoothing; this is the case in Chile. In the Netherlands the role of funded private pensions as a complement to universal basic public benefits was explicitly recognised by employers' and employees' organisations, who in 1969 adopted the principle that the combined replacement rate should be 70% of final salary for an individual with a 40-year contribution history. This understanding held during the 1980s: cuts in public benefits were compensated by increases in private occupational benefits. Such complementarity may be difficult to sustain going forward as private DB schemes face sustainability issues and do not cover newer types of employment contract.

50. Funded pensions offer a number of advantages compared to unfunded pensions. They provide stronger incentives to participate in the labour market and to save for retirement. They create a pool of savings that can be put to productive use in the broader economy. Invested assets can exploit opportunities in the financial markets to earn more than the rate of wage inflation, which is the implicit rate of return of PAYG schemes. Within DC schemes, each cohort is self-funding, reducing labour market distortion.

51. However, funding removes the opportunity for inter- and intra-generational risk sharing that is a source of economic efficiency within unfunded systems. Within a PAYG DB scheme, risks can be shared between workers and retirees by adjusting contribution and benefit levels. The gains in social solidarity that are available through inter- and intra-generational redistribution within PAYG schemes may also offset some of the fiscal costs. This type of redistribution could be partially restored via a non-contributory basic pension financed out of general tax revenues, or by adjusting the parameters of private funded DB schemes.

52. Some countries intend that funded pensions will ultimately replace public pensions as the main source of retirement income as the system matures, while public pensions continue to provide a minimum level of protection to individuals who fall outside the private system. Australia's pension system consists of the Age Pension, a means-tested universal benefit funded by current taxpayers; the Superannuation Guarantee ("Supers"), a mandatory DC scheme funded by employers; and voluntary Superannuation, a tax-advantaged personal savings scheme. As individuals build up their DC assets, their entitlement to benefits from the Age Pension reduces. The Age Pension

is a DB arrangement so protects against longevity risk, labour market and social risks while the Supers provide consumption smoothing and a higher replacement rate. As the role of the Age Pension shrinks, alternative forms of insurance may be needed in order to maintain the overall strength of the system.

53. Furthermore, policy makers need to ensure that private schemes work in the best interests of members, by requiring high standards of governance and of investment and operational expertise, as outlined in the OECD Core Principles of Private Pension Regulation. In extreme circumstances, they may need to establish mechanisms to bail out private schemes.

Defined benefit or defined contribution

54. Funded pensions can be either defined benefit or defined contribution. DC arrangements establish a direct link between contributions and retirement income, so are the most effective method of smoothing consumption and provide the greatest incentive to contribute. However, DC plans transfer the responsibility for financial security in retirement onto individuals without offering them insurance against the multiple risks that can affect funded pensions. The lack of insurance inherent in an individual DC arrangement means that they are not permitted as part of the mandatory provision in some countries.

55. It is possible to introduce elements of insurance into DC pensions. Chile covers some labour market and social risks with compensatory pension contributions from the state for periods of missed earnings such as maternity leave. Many countries require DC providers to offer a default strategy that either follows a lifecycle approach or offers some protection against financial market risks. In Estonia, Latvia and the Slovak Republic, individuals who do not make an active choice will be allocated to a conservative strategy. By contrast in Sweden, where the public NDC system means that individuals are relatively well insured, the default strategy in the Premium Pension Fund is quite aggressive.

56. Individual DC pensions adjust automatically to demographic changes, although at the risk of inadequate pensions – if life expectancy increases, payments from a DC pot will run out. Individuals find it difficult to smooth their consumption post retirement – there is evidence from Australia that retirees underspend because they are afraid of exhausting their savings. Some longevity protection can be added to DC systems - the OECD Roadmap for the Good Design of DC Pension Plans recommends a combination of programmed withdrawals with a deferred life annuity as a default option for the payout phase - but payments must necessarily be lower if they have to last over a longer period. Switzerland requires that at least 75% of accrued pension capital is taken as a lifetime annuity, Norway imposes a pay-out phase of at least 10 years while Belgium allows lump-sum pay-outs. Mandatory annuitisation could call for an enhanced role for the public sector, as in Sweden, to maximise the benefits of risk pooling and avoid self-selection issues and overcome behavioural barriers to choosing the right annuity.

57. DB schemes provide insurance against longevity risk in the pay-out phase and risk pooling in the contribution phase. However, Westerhout et al (2014) argue that collective systems may not be welfare-enhancing overall. This is because their design does not take members' ages into account. Contribution levels and benefits are age-independent and contribution and indexation policies are not matched with each other, leading to inefficient consumption smoothing. In addition, investment strategies target

solvency ratios rather than total member wealth, whereas DC schemes may follow a lifecycle approach.

58. Although DB schemes are intended to cover individual longevity risk, they do not adjust automatically to demographic trends. DB schemes in the Netherlands and Canada did not prove robust to the demographic shocks of increased longevity and an imbalance between the sizes of the working and retired cohorts. As the sustainability of pure DB systems has come under threat, different methods of risk sharing have been introduced that push more of the longevity, economic and market risk onto members but retain the risk pooling of DB. An example is the conversion of public sector schemes in New Brunswick (Box 1). The new designs may be referred to as "shared risk schemes" or "collective defined contribution".

Box 1. New Brunswick shared risk schemes

Shared risk schemes were introduced in New Brunswick in response to sustainability issues brought on by demographic and investment risks. Existing DB schemes were converted to the new model, which constrained some of the choices available to policy makers in terms of changing the parameters of the schemes.

The shared risk schemes were designed to achieve the objectives of sustainability and intergenerational equity. They expressly did not set a target replacement rate or benefit adequacy standard, prioritising the stability of payments rather than the level.

Benefits were made contingent on the solvency of the fund. "Base benefits" have to have at least a 97.5% probability of being paid and "ancillary benefits" (such as indexation) a 75% probability. The retirement age was increased and routes to early retirement closed off.

Employers participated in the risk sharing. They had to build a buffer fund so that the first cohort of contributors under the new design were not penalised, and their contributions were fixed for 5 years.

Employees continue to benefit from risk pooling in longevity insurance as the schemes internally annuitise on behalf of their members.

59. Individual DC plans are probably better suited to changing labour market patterns, such as multiple employers and increased self-employment, than DB schemes. Within DB plans a uniform contribution rate combined with a uniform accrual rate (i.e. how quickly rights are built up) will lead to redistribution from lower earners to higher earners and from new members to long-standing members, which could impede labour mobility. However career breaks early on are especially costly for members of DC plans in terms of building up retirement assets (because the opportunity for compounding returns is lost).

Mandatory versus voluntary pensions

60. If funded pensions are introduced, a decision will be needed as to whether to make them mandatory or voluntary, or a combination. Switzerland has a funded occupational system whereby contributions are mandatory up to a level of around 120% of average earnings and voluntary thereafter.

61. Funded pensions are intended to encourage individuals to take on more responsibility for their financial security in retirement, so mandating could be seen as contradictory since it removes individual choice. Voluntary provision is less likely to distort labour markets and may be the only possibility in countries without the institutional capacity to establish mandatory pensions. In addition, Holzman and Hinz (2005) remind us that the least well off may have more immediate needs than saving for retirement and so forcing them to contribute to pensions would be welfare-reducing. By the same token, high income individuals might not need to be forced into consumption smoothing as they are well placed to take advantage of voluntary schemes.

62. In terms of performance, it is not clear whether mandatory or voluntary arrangements do better. Musalem and Pasquini (2012) found that occupational schemes (which are more likely to be mandatory) generally earn higher returns on their investments than pension systems with personal pension schemes. Countries with long-standing mandatory systems such as Australia, the Netherlands and Switzerland have seen assets grow to a significant proportion of GDP, implying that mandating has been successful at smoothing consumption. However, they have also seen a build-up of many small funds with relatively weak governance, to the detriment of members. This, together with the potential for large funds to reap economies of scale,[11] implies that there may be a case for restricting competition within a mandatory system.

63. Behavioural studies provide strong support for mandatory or quasi-mandatory arrangements, as discussed in [DAF/AS/PEN/WD(2017)3]. There is considerable evidence that individuals find it difficult to plan ahead for their retirement and would likely not save enough during their working lives. Mandating can take different forms. In the UK, companies must offer pension schemes and employees are automatically enrolled with the option of opting out; in Australia, superannuation is compulsory from the perspective of employers. In New Zealand, soft compulsion in the form of automatic enrolment is combined with individual incentives such as matching contributions.

64. Tax incentives can be used to encourage contributions to both mandatory and voluntary systems and to share risks between the individual, the state and other tax payers. Tax breaks on contributions can encourage people to contribute more and may make the overall tax treatment of consumption more consistent across the pre- and post-retirement periods (depending on how benefits are taxed). However, wealthier individuals who are in a position to save more into private pensions will enjoy a higher value of tax breaks, implying that a cap is needed on tax concessions (see OECD (2015b)) for further discussion). Furthermore, it is unlikely that lost taxes on contributions will be recouped through taxes on other parts of the pensions system, contributing to sustainability concerns.

65. An important design feature of mandatory arrangements is the extent of their coverage. Australia excludes the self-employed from its mandatory system on the grounds that they need the flexibility to invest in their businesses and that these will provide a form of financial security for retirement. However, the line between "self-employed" and "gig economy" remains fluid for now.

66. There can be operational difficulties in implementing a mandatory private system. In Germany, there was concern that companies that did not previously offer voluntary schemes to their employees would free ride on existing collective agreements once

[11] See [DAF/AS/PEN/WD(2017)1)]

occupational pensions became mandatory. Where a well-established voluntary system already exists, it may be easier to move to a mandatory system (as was the case in Switzerland).

V. Building a complementary system

67. Within the pension system, different design elements interact. Policymakers can improve the resilience of the overall pension system and target specific objectives by using different combinations of public and private pensions to introduce new design elements. However, making changes to the pension system may result in transition costs for both individuals and governments.

Pension system interactions

68. Mixed pension systems should be able to exploit complementarities. For example, a combination of a basic pension, some PAYG public and funded private pension arrangements may provide insurance against longevity risk, labour market and social risks (primarily through public arrangements) as well as consumption smoothing and higher retirement income (primarily through private funded arrangements).

69. Different elements within a system may conflict, however. In New Zealand, the 2010 review by the Retirement Commission found that the universal Superannuation scheme and the voluntary KiwiSaver scheme were in effect competing for government subsidies (either direct funding or tax benefits). In Sweden, the mismatch between the ages at which benefits can be drawn from the minimum guaranteed pension system, the public NDC system and the funded system can be exploited to finance early retirement.[12] The insurance against social risks provided by PAYG arrangements (e.g. public disability benefits) could be used to pay benefits until individuals are eligible for their retirement payments.

70. In the US, the potential for different elements of the pension system to encourage individuals to retire early is addressed by incentives for people to stay in the labour market for longer. Social Security benefits can be taken at age 62 but the pension benefit is increased by 8% for each year that the claim is deferred beyond retirement age and in a number of states, pensioners pay lower income tax rates. There are also disincentives for accessing 401k balances before the age of 60.

71. Means testing of public pension benefits can create distortions, depending on which assets are captured in the assessment. For example, excluding housing from the calculation of assets may redistribute from people who do not own property to those who do and discourage retirees from downsizing if selling their home would trigger extra taxes that would not otherwise be due. This in turn can make it harder for younger generations to buy property.

72. Means testing could also discourage people from working beyond retirement, if their earnings from employment mean their benefits are reduced. Income testing – excluding assets from the calculation of eligibility for benefits but including earnings on those assets – tends to provide disincentives for lower earners to save beyond the minimum requirement.

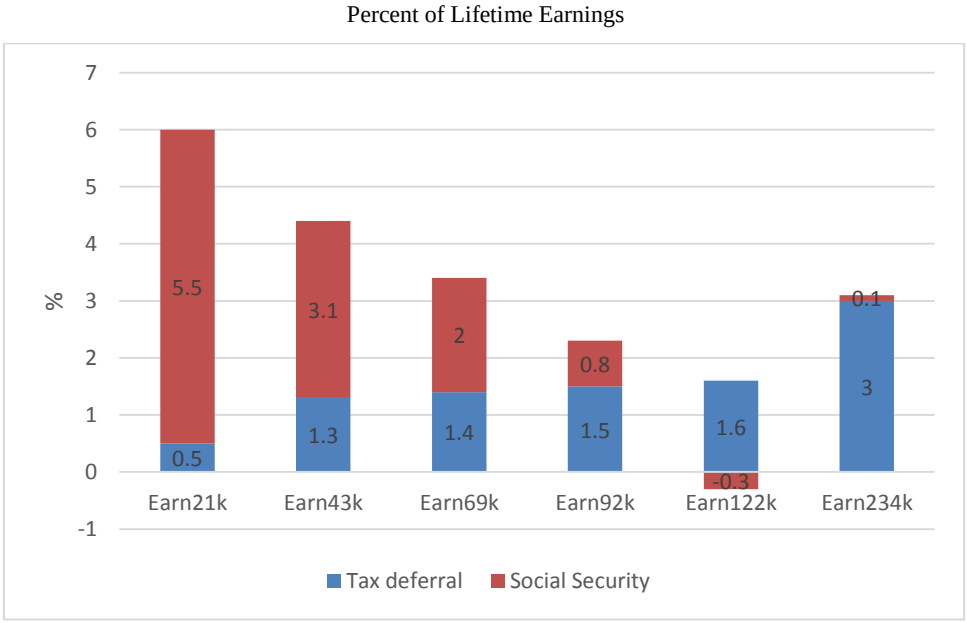
[12] Palmer (2008)

73. Pension systems also interact with other policy areas, especially the tax system, which can have a significant impact on how objectives and risks are addressed. In Australia, retirement income above the tax threshold is fully taxable, while lump sums are subject to low tax rates. This discourages retirees from converting their Super pots into drawdown products such as annuities, leaving them more exposed to longevity risk.

74. Implicit taxes may also be important. Gruber and Wise (1999) found that in the EU, there were high implicit taxes on earnings for people who worked beyond the state retirement age, stemming from three sources. Firstly, DB benefits from the PAYG system were not increased to take account of the shorter time in retirement; secondly, payroll taxes were high; and thirdly, generous benefits were foregone by staying in work. The incentive to stay in the labour market is thus reduced.

75. Tax treatment affects redistribution. ICI (2015) finds that within the US retirement system, tax deferral for higher earners saving into private pensions generates similar levels of benefits as a proportion of total lifetime compensation as does Social Security for medium earners. Figure 4 shows total lifetime benefits for different groups, decomposed into tax effects and Social Security effects. The highest paid group (Earn234k) gets benefits with a net present value of 3.1% of lifetime earnings, compared to 3.4% for the third-lowest paid group (Earn69k), but the high earners get 3.0% points of their overall gains from tax deferral while the lower earners get 2.0% points from net Social Security benefits. The study concludes that higher earners get more benefit from tax deferral than do lower earners because they need to realise more of their consumption smoothing via voluntary pensions.

Figure 4. Present Value of Tax Benefits of the US Retirement System



Source: ICI (2015)

76. All pension designs create labour market distortions. Ultimately all PAYG and funded pension contributions are paid for by employees through contributions or lower wages (employers will cut current or future pay to offset the cost of pension contributions). This will have an impact on labour supply and on unit labour costs. Some

economists argue that labour market effects will vary according to the way contributions are collected: from the employer, the employee or through income taxes.

77. Introducing new design elements can strengthen pension systems and give more flexibility to policy makers, however it may create complexity that is difficult for governments to administer and for individuals to navigate. In Denmark, the income test for the minimum pension takes into account all household taxable income.[13] This means that benefits are highly targeted to those households in greatest need, but it creates a complicated incentive structure as benefits are affected by both spouses' financial situation and distance to retirement. Complexity tends to be regressive, conflicting with the objective of redistribution.

Transition costs

78. Introducing supplementary pensions can create transition costs for both the state and individuals. Supplementary funded pensions are intended to relieve the fiscal burden of public PAYG systems by creating additional consumption smoothing in new pension arrangements. However, this consumption smoothing can carry a big fiscal cost, if it diverts contributions from the PAYG system to the funded system.

79. If contributions into the old PAYG system fall, then unless benefits to retired generations are reduced, the government will have to divert revenues, borrow more or raise taxes to make up the shortfall. This means that the costs of transition are ultimately likely to fall indirectly on current workers, who have to pay into the new funded pensions and still bear the cost of paying for benefits due under the old PAYG system. An abrupt move to funded pensions can be especially costly for older workers, who have less time to build up their individual entitlements before they leave the workforce.

80. A number of countries, notably France, are moving from a PAYG public system to a partially funded model with more private provision. Such a move can be made gradually in order to smooth the fiscal costs, as was the case in Sweden. Sweden introduced NDC accounts with a small element of funding and created a points system for transferring entitlements from the old PAYG system to the new system. Individuals born before 1953 are entitled to some benefits calculated under the old rules and some under the new system, with the weighting between the two varying by age.[14] Chile, by contrast, moved directly to a fully-funded, DC model without a long transition period and smoothed the fiscal cost by introducing a Recognition Bond to credit contributions to the previous system to new individual accounts.

81. The fiscal costs of moving to a funded system are exacerbated as it makes the implicit liabilities of the PAYG system explicit. Poland's experience illustrates the potential difficulties of implementing pension reforms, even with a relatively long transition period. In 1999, Poland replaced the public, PAYG system with private, DC accounts. Younger generations were required to join the new system, workers aged between 30 and 50 years at the time of the reform were offered a choice between NDC and DC accounts and older generations remained in the PAYG arrangement. The resulting budget deficit was expected to be offset by the gains from privatisation,

[13] Special regulations exempt work income up to a certain threshold.

[14] For example, someone born in 1939 receives 15/20 of their entitlements from the old system while 5/20 of their PAYG pension credits were transformed into NDC pension credits.

however accounting rules meant that the liabilities of the PAYG system could not be set against the assets being built up in the private funded arrangements.

82. The Polish case also illustrates the need for a strong institutional set-up in order to implement successful pension reform. The Polish system was split between the state-run administration body, ZUS, and private sector asset managers (OFE), raising the possibility of challenges as to the role and operational efficiency of each actor. Funded, private pensions require the private sector to be capable of both administering and investing large volumes of contributions.

83. Introducing funded pensions in order to promote consumption smoothing will be less effective when funded pensions are financed out of social insurance contributions which would otherwise go to the public PAYG system. Sweden's public funded DC scheme, the Premium Pension, represents only 2% points of contributions, so this effect is relatively small. However, some CEE countries that combine PAYG public benefit with individual private DC accounts diverted a relatively large proportion of contributions from the public to the private system, exacerbating the transition costs (see OECD Pensions Outlook 2012, Chapter 2 for a fuller discussion).

84. Over the long term, transition costs may be at least partially offset by additional positive economic effects associated with introducing private pensions rather than relying solely on public provision. Rein and Turner (2001) cite evidence that poverty rates have declined in Australia, the Netherlands and Switzerland since mandatory funded pensions were introduced. The initial transformation of Poland's public PAYG system into a multi-pillar DC approach helped to encourage Warsaw's development as a financial centre. As outlined in OECD (2011), the introduction of funded DC pensions in Chile encouraged the growth of financial markets and provided a source of domestic financing.

VI. Conclusions and policy implications

85. Public and private arrangements can be used to introduce different elements of pension design – funded or unfunded, DC or DB –into the overall system. While public pensions are best equipped to achieve the objective of poverty relief, other objectives – especially consumption smoothing – can be addressed in a variety of different ways. The USA combines a PAYG system with voluntary DC, the Netherlands has a public basic pension plus mandatory funded DB, Australia and Chile have a means-tested basic pension plus mandatory DC, and France and Spain rely primarily on PAYG.

86. Most countries are increasing the role of funded pensions in meeting the objective of consumption smoothing.[15] This raises the possibility that individuals will be exposed to more of the risks associated with building up savings over their working lives and ensuring that these are sufficient to last over their full lifetime in retirement. These risks are greatest for individuals saving into DC schemes.

87. Table 4 summarises the various objectives of pension systems, how different pension designs can help to achieve them, and the risks to which these designs are vulnerable. It can be seen that there are trade-offs involved in determining priorities and allocating responsibilities for pension provision, giving rise to a number of policy implications:

[15] See OECD Pensions Outlook 2016, Chapter 1

- Non-contributory public pensions are the most efficient vehicle for achieving the objective of poverty relief; they also contribute to goals of equity and redistribution with only a limited negative affect on labour market participation.
- The primary risk to PAYG arrangements is demographic risk; individuals are insured against all other types of risk.
- As private, funded DC arrangements play an increasing role in pension provision the insurance against all the other risks will be lost. Policy makers may require that it is built into the funded system or continue to provide insurance via a PAYG arrangement.
- Introducing a funded pension arrangement is intended to make pension systems more sustainable and to improve consumption smoothing. However the transition may put additional strain on the PAYG system or public finances while increasing the proportion of risks borne by individuals, if contributions to the new arrangements are made at the expense of the existing scheme. Such moves should therefore be introduced gradually.
- However a pension system that includes both PAYG and funded arrangements is better able to achieve its various objectives and more resilient to the multiple risks to old-age financial security.
- DC pension arrangements are more sustainable than DB pension arrangements because DC pensions adjust automatically to any changes in the parameters (e.g. contributions, returns, longevity).

Table 4. Summary of pension designs, objectives and risks

Objective	Public Pension – Non-contributory	Public Pension – Contributory PAYG	Public Pension – Contributory Funded	Private Funded Pension – Mandatory DB	Private Funded Pension – Mandatory DC	Private Funded Pension – Voluntary
Poverty relief	General taxation is the most equitable and efficient way of providing poverty relief in a redistributive system. Provides backstop insurance against labour market, social and longevity risk Depends on ability of tax base to support it.	May be used to determine eligibility for poverty relief and/or consumption smoothing Covers longevity risk	Covers longevity risk	Covers longevity risk	Safeguards required against resources being exhausted (longevity risk) – e.g. compulsory annuitisation	Not suitable for poverty relief
Consumption smoothing		May be primary vehicle for consumption smoothing for all individuals (e.g. France) or primarily for lower earners (UK)	Contributes to consumption smoothing according to the parameters for contributions and benefits	Employer and employee contributions ultimately come out of salaries therefore contributes to consumption smoothing	Direct link between contributions and benefits Where private DC is partially funded at the expense of public contributory arrangements, the impact on consumption smoothing will be reduced	Contributes to consumption smoothing to the extent that savings into voluntary schemes do not just divert savings from other vehicles
Financial sustainability	Depending on benefit level and entitlement, may conflict with other priorities for public expenditure	Can be vulnerable to macro-economic and demographic risks. Sustainability depends on benefit levels, retirement age, indexation Transition to funded systems can worsen sustainability of PAYG systems	Can be vulnerable to macro-economic and demographic risks. NDC may improve sustainability by closely linking benefits to contributions. Potential for operational risks Transition from PAYG to partial funding can make the PAYG system less sustainable	Vulnerable to demographic risks and low interest rates Potential for operational risks	Sustainability achieved by pushing more risk onto individuals – creates a requirement for a public system to provide some insurance Potential for operational risks	Fully sustainable
Redistribution	Part of progressive taxation. Means testing can increase redistribution effect	Can adjust parameters to increase redistribution e.g. link between contributions and benefits, floors and ceilings, accrual rates, indexation	Can adjust parameters to increase redistribution e.g. link between contributions and benefits, floors and ceilings, accrual rates, indexation	Not an objective of DB schemes. Tax incentives may be less progressive than overall tax system	Not possible within individual DC schemes. Tax incentives may be less progressive than overall tax system	Not possible within individual DC schemes. Tax incentives may be less progressive than overall tax system

Inter-generational equity	Within tax system	Demographic changes mean redistribution from current contributors to current retirees. This can be offset by adjusting benefit levels and accruals – this shifts part of macro-economic and longevity risk onto individuals	Demographic changes mean redistribution from current contributors to current retirees. This can be offset by adjusting benefit levels and accruals – this shifts part of macro-economic and longevity risk onto individuals	Longevity risk shared across generations. Risk sharing mechanisms can be introduced	Not possible within individual DC	Not possible within individual DC
Intra-generational equity		Can use compensatory mechanisms to offset missed contribution periods – therefore provides insurance against labour market and social risks. However this may be interpreted as a right so weaken incentive to contribute.	Can use compensatory mechanisms to offset missed contribution periods – therefore provides insurance against labour market and social risks	Collective systems can provide insurance against labour market and social risks	Not possible within individual DC Insurance against labour market and social risks can be purchased but at a higher cost than in a collective arrangement	Not possible within individual DC
Benefit adequacy/replacement rate	Can be set as minimum or target replacement rate for average earner (note potential fiscal implications)	Can be used for minimum income guarantee or for target replacement rate. Target may vary by income level	Target replacement rate may vary by income level.	Target replacement rate, though increasing move towards conditional indexation i.e. less protection against macro-economic risk	Vulnerable to macro-economic, financial market and operational risks. Investment strategy has significant impact on benefit levels.	Generally used to increase replacement rate for higher earners
Labour force participation	May weaken incentives	May reduce incentives to work past retirement age: close routes to early retirement and align age at which public and private benefits can be accessed	Incentive depends on link between contributions and benefits: close routes to early retirement and align age at which public and private benefits can be accessed	Uniform accrual rates penalise younger workers/those with less seniority – DB may be less adaptable to changing labour market conditions	Strong incentive	Limited incentive, unless no other savings vehicle available
Coverage	Universal	Excludes people who have never participated in formal economy	Can be extended to all workers within formal economy relatively easily	Tend to exclude the low-paid, part-time workers, self-employed	Tend to exclude the low-paid, part-time workers, self-employed	Generally used by higher earners. Incentives such as matching contributions can encourage more people to participate

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