



Financial Incentives and Retirement Savings



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Foreword

Financial Incentives and Retirement Savings reviews how countries design financial incentives to promote savings for retirement and examines whether there is room for improvement. Given the cost financial incentives represent for governments, it is important to verify whether they are still effective tools for encouraging citizens to save for retirement. The publication first describes how countries currently design financial incentives. It then assesses the overall tax advantages that these incentives provide to individuals, how these incentives affect the way individuals save for retirement and the fiscal cost these incentives represent to governments. The publication also compares different approaches to designing financial incentives based on their inherent characteristics and within a common framework to assess the different implications for individuals and governments. Finally, it provides policy guidelines to help countries improve the design of their financial incentives with a view to promoting savings for retirement.

This publication is part of the research and policy programme of work of the OECD Working Party on Private Pensions (WPPP). This international body brings together policy makers, regulators and private sector representatives from close to 40 countries to discuss issues related to the operation and regulation of funded retirement income systems.

This publication was prepared by Pablo Antolín and Stéphanie Payet of the Insurance, Private Pensions and Financial Markets Division of the OECD Directorate for Financial and Enterprise Affairs. It has greatly benefitted from the comments of national government delegates of the WPPP. Delegates assisted in verifying the accuracy of the information corresponding to their respective countries. Any remaining errors are solely the responsibility of the authors. We would like to thank Ambrogio Rinaldi, Chair of the WPPP, for his useful advice, support and valuable inputs to this project. Comments and inputs from Diana Hourani are gratefully acknowledged. Editorial and communication support was provided by Pamela Duffin, Kate Lancaster and Edward Smiley.

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Executive summary

Governments have long used financial incentives to promote savings for retirement. Financial incentives are meant to encourage participation in retirement savings plans and boost overall retirement income by making private savings, as a complement to public savings, more attractive. Historically, tax incentives have been the dominant type of incentive, providing favourable tax treatment to retirement savings as compared to other types of savings. More recently, new types of financial incentives have emerged, which are not linked to the tax system. These non-tax incentives include matching contributions, where governments match the employee's contribution to the pension account, and fixed nominal subsidies paid into the pension account of eligible individuals.

This publication reviews how countries design financial incentives to promote savings for retirement and considers whether there is room for improvement. Given the cost that financial incentives represent to governments, it is important to verify whether they are still effective tools to promote savings for retirement, taking into account different needs across the population. The publication ends with policy guidelines to help countries improve the design of their financial incentives for promoting savings for retirement.

Key findings

- All countries provide financial incentives to promote savings for retirement. The most common approach exempts contributions and returns on investment from taxation and taxes withdrawals (“EET”).
- In all countries, financial incentives provide an overall tax advantage to individuals, in the sense that they pay less taxes over their working and retirement years when contributing the same amount (before tax) to a retirement savings plan rather than to a benchmark savings vehicle. This overall tax advantage varies with the income level of the individual.
- Financial incentives, tax and non-tax, can be effective tools to promote savings for retirement. In particular, allowing individuals to deduct pension contributions from taxable income encourages participation in and contributions to 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 more sensitive to non-tax incentives (matching contributions and fixed nominal subsidies) than to tax incentives.
- The total fiscal cost of financial incentives varies greatly across countries, but remains in the low single digits of GDP. Its evolution over time depends on the extent to which retirees draw their pension based on a full career and constant contribution rules and the countries' demographics.
- The way individuals perceive different designs of financial incentives may distort plan choices and savings levels even though those designs may be economically

equivalent under certain assumptions. Low levels of financial knowledge and behavioural biases may lead some individuals to fail to choose the tax treatment that will provide them with the largest overall tax advantage.

Policy guidelines

1. **Financial incentives are useful tools to promote savings for retirement.** They encourage people to participate in and contribute to retirement savings plans, while keeping individual choice and responsibility for retirement planning.
2. **Tax rules should be straightforward, stable and common to all retirement savings plans in the country.** Different tax rules for different types of plan and frequent changes to those rules may create confusion and reduce people's trust in the system.
3. **The design of tax and non-tax incentives for retirement savings should at least make all income groups neutral between consuming and saving.** This tax neutrality is achieved when the way present and future consumption is taxed makes the individual indifferent between consuming and saving. The tax treatment of retirement savings should at least not discourage savings.
4. **Countries with an "EET" tax regime already in place should maintain the structure of deferred taxation.** The upfront cost incurred at the introduction of the pension system with deferred taxation is already behind in most countries and the rewards in the form of large tax collections on pension income are in the horizon.
5. **Countries should consider the fiscal space and demographic trends before introducing a new retirement savings system with financial incentives.** The maturity of the pension system and demographics influence the fiscal cost related to financial incentives.
6. **Identifying the retirement savings needs and capabilities of different population groups could help countries to improve the design of financial incentives.**
 - a. **Tax credits, fixed-rate tax deductions or matching contributions may be used when the aim is to provide an equivalent tax advantage across income groups.** Financial incentives that equalise the tax relief provided on contributions for all individuals, independently of their income level and marginal income tax rate, achieve a smoother distribution of the overall tax advantage across the income scale.
 - b. **Non-tax incentives, in particular fixed nominal subsidies, may be used when low-income earners save too little compared to their savings needs.** Non-tax incentives are better tools to encourage retirement savings among low-income earners, who are less sensitive to tax incentives.
7. **Countries using tax credits may consider making them refundable and converting them into non-tax incentives.** Individuals with a low tax liability can still benefit from tax credits when they are refundable. The value of the credit is strengthened when it is paid directly into the pension account, in order to help individuals to build larger pots to finance retirement.

8. **Countries where pension benefits and withdrawals are tax exempt may consider restricting the choice of the post-retirement product when granting financial incentives.** When withdrawals are tax exempt, financial incentives may lose their purpose if individuals withdraw early or take a lump sum. To counter this, policy makers could restrict the choice of when and how to withdraw the money; take back part or all of the financial incentives when individuals take a lump sum or withdraw early; or encourage people to selected post-retirement products that are more in line with the objective of people having a retirement income.
9. **Countries need to regularly update tax-deductibility ceilings and the value of non-tax incentives to maintain the attractiveness of saving for retirement.** Keeping tax-deductibility ceilings for contributions and the value of non-tax incentives (maximum matching contribution, subsidy) constant over time may reduce the attractiveness of saving for retirement and lower the positive impact on participation and contribution levels.

Chapter 1. Why countries provide tax and non-tax financial incentives for retirement savings

This chapter first explains the scope of the analysis, describing the different types of financial incentive considered, it then presents different motives for countries to introduce financial incentives to promote savings for retirement, and it ends providing the structure of the publication.

1.1. Scope of the analysis: Tax and non-tax financial incentives

The analysis in this publication covers two types of financial incentive that countries use to encourage individuals to save for retirement in funded private pension plans: tax incentives and non-tax incentives.

Tax incentives come from a differential tax treatment applied to funded pension arrangements as compared to other savings vehicles. In most countries, the “Taxed-Taxed-Exempt” (“TTE”) tax regime applies to traditional forms of savings, with contributions paid from after-tax earnings, the investment income generated by those savings taxed and withdrawals exempt from taxation. When the tax regime applied to funded pension arrangements deviates from the “TTE” tax regime, this could lead individuals to pay less taxes over their lifetime.

Non-tax financial incentives are payments made by the government directly into the pension account of eligible individuals. They can take the form of matching contributions or fixed nominal subsidies. Matching contributions are usually conditional on the individual contributing and correspond to a certain proportion of the individual’s contributions, up to a nominal ceiling. Fixed nominal subsidies are designed to attract low-income earners as the fixed amount represents a higher share of their income.

Other types of financial incentive exist but are not considered. These include non-tax incentives provided on social contributions (e.g. deduction of pension contributions for the calculation of social contributions, reduced social contribution rate on pension withdrawals) and tax incentives provided to employers (e.g. tax allowances when making contributions on behalf of certain employees).¹ Employers may also match employees’ contributions. These types of financial incentive are included in the country profiles in Annex A but are not further considered in the analysis.

1.2. Why countries provide financial incentives for retirement savings

Policy makers, when introducing financial incentives for funded pension arrangements, may aim at increasing overall savings, reallocating savings into retirement savings plans, developing the supplementary role of funded pensions in the provision of retirement income, or simply at treating equally all types of retirement savings, whether in public or private schemes.

Some countries have low national savings relative to their investment needs and may wish to increase overall savings. The level of national savings has important implications for the economy, as it provides a source of funds available for domestic investment, which in turn is a key driver of labour productivity and thus higher future living standards. Increasing national savings could be achieved by introducing incentives to encourage new savings (i.e. through a reduction of consumption or an increase in labour supply). These incentives could focus on retirement savings plans.

Retirement savings are for the long haul. Therefore, increasing savings for retirement could increase long-term investment, enhance the depth and characteristics of the financial sector and facilitate long-term growth. Thus, even a country that has enough overall savings may want to promote funded private pensions to reallocate savings into retirement savings plans. In addition, even if people know that saving for retirement is for their own best interest, they do attach more weight to present than to future consumption and therefore tend to save too little. In that respect, procrastination, inertia and short-sightedness can be significant barriers to act. Reallocating other types of savings into

retirement plans would not increase overall national savings (combined public and private) but would earmark a greater share for retirement. However, money in retirement savings plans is usually locked in until retirement, while other savings vehicles usually offer more flexibility as to when and how to make use of the money. Financial incentives therefore need to account for this constraint.

Recent reforms to pay-as-you-go (PAYG) financed public pension systems have increased the need to enhance the role of private pensions in the provision of retirement income. OECD governments have been active in reforming pension systems over the last decade (OECD, 2017^[1]), often readjusting downwards public pension benefits to make them financially sustainable and increasing the role of private pensions, in particular defined contribution plans. Providing financial incentives is intended to increase participation in, and contributions to, retirement savings plans in order to complement public provision, increase overall pensions and thus improve pension adequacy. In addition, promoting retirement savings is a way to help people accumulate enough financial resources by the time they retire, thus reducing reliance on the public safety net which helps to rein in public expenditures.

Finally, public PAYG pension arrangements are generally subject to the “EET” tax regime. In most OECD countries, employees’ social security contributions are deductible from income, the (implicit or explicit) internal rate of return of the PAYG scheme is exempt from personal income tax, and pension benefits are taxed as income (OECD, 2017^[2]). Countries may want to treat savings, whether through PAYG or funded pension arrangements, equally, in particular when these are part of the mandatory system.

1.3. Structure of the monograph

The purpose of this monograph is to review how countries design financial incentives to promote savings for retirement and examine whether there is room for improvement. Given that financial incentives entail a fiscal cost to governments, it is important to verify whether they are effective tools for encouraging people to save for retirement, taking into account different needs across different population subgroups.

The monograph first describes how countries currently design financial incentives. It then assesses the overall tax advantages that these incentives provide to individuals, how these incentives affect the way individuals save for retirement and the fiscal cost these incentives entail to governments. The monograph also compares different approaches to designing financial incentives based on their inherent characteristics and using a common framework to assess the different implications for individuals and governments. Finally, it provides policy guidelines to help countries improve the design of their financial incentives with a view to promoting savings for retirement.

The monograph is organised as follows. Chapter 2 describes the tax treatment of retirement savings in funded private pension arrangements across 42 OECD and selected non-OECD countries.² It provides details regarding the tax treatment of contributions, returns on investment, funds accumulated and withdrawals. It also describes non-tax financial incentives offered to individuals saving for retirement, mainly matching contributions and fixed nominal subsidies.

Chapter 3 assesses the extent to which different designs of tax and non-tax incentives translate into a tax advantage when people save for retirement. This assessment requires a common metric to compare the outcome of the different tax and non-tax incentives across countries. The analysis uses the overall tax advantage as the metric. The approach used

consists in comparing the tax treatment of a private pension plan to that of a benchmark savings vehicle, i.e. comparing how contributions, returns on investment and withdrawals are taxed in each savings vehicle. The overall tax advantage is then defined as the amount that an individual would save in taxes paid during their working and retirement years by contributing the same pre-tax amount to a private pension plan instead of to a benchmark savings vehicle. Chapter 3 first introduces the overall tax advantage and describes how the metric varies with different parameters. It then calculates the overall tax advantage provided in OECD and selected non-OECD countries when people save for retirement.

Chapter 4 then examines whether financial incentives are effective tools to promote savings for retirement. It reviews the empirical and non-empirical literature analysing how tax and non-tax financial incentives affect the way individuals save for retirement. In particular, it assesses whether individuals increase their participation in, and contributions to, retirement savings plans as a response to financial incentives, and whether this is achieved through an increase in savings or a reallocation of savings.

Financial incentives to promote savings for retirement entail a fiscal cost to governments. Chapter 5 therefore assesses the cost of promoting savings for retirement via tax and non-tax financial incentives from the point of view of fiscal policy and the budget. It first defines the concept of tax expenditure and presents how countries report the cost related to financial incentives for retirement savings. It then introduces the net tax expenditure measure to be able to have cross-country comparisons, and calculates that measure for a selection of countries over the period 2015-2060. The analysis and calculation of the net tax expenditure is done for countries that have the appropriate data to be able to make those calculations (e.g. having the breakdown by age in 2015 of the number of contributors, total contributions, total assets, the number of beneficiaries and total withdrawals).

Chapter 6 assesses alternative approaches to designing financial incentives to promote savings for retirement. The purpose is to see whether there are other approaches that would provide an improvement on the current main approach to providing incentives that taxes only withdrawals and exempts contributions and returns on investment. The analysis measures improvements both through the tax advantage that people may get over their lifetime when saving for retirement, and through the fiscal cost for the treasury. It uses a theoretical framework and illustrative cases to conduct such comparison, abstracting from country-specific parameters, to understand the inherent characteristics and implications of different approaches.

Chapter 7 ends by proposing a set of policy guidelines to help countries improve the design of their financial incentives with a view to promoting savings for retirement. These guidelines are based on the analysis of country practices and on the comparison of the inherent characteristics of different approaches to designing financial incentives to promote savings for retirement.

The annex provides country profiles with detailed information about how OECD and selected non-OECD countries design financial incentives to promote savings for retirement. Each country profile describes: i) the structure of the funded private pension system; ii) the tax treatment of retirement savings (contributions, returns on investment, funds accumulated and withdrawals); iii) non-tax incentives; iv) the social treatment of contributions and benefits; v) the tax treatment of pensioners; and vi) the incentives for employers.

Notes

¹ Social contributions are usually levied on gross salaries and wages to finance among others, health care insurance, unemployment insurance, public pensions and disability pensions

² The selected non-OECD countries are the non-OECD EU Member States plus Colombia, which is in the process of joining the OECD.

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http://dx.doi.org/10.1787/tax_wages-2017-en.

Chapter 2. The tax treatment of retirement savings in funded private pension arrangements

This chapter describes and compares the tax treatment of retirement savings in funded private pension arrangements across 42 OECD and selected non-OECD countries. It provides details regarding the tax treatment of contributions, returns on investment, funds accumulated and withdrawals. It also describes other forms of financial incentives offered to individuals saving for retirement, mainly matching contributions and fixed nominal subsidies. The information refers to 2018 and covers all types of funded private pension plan in each country.

Countries use two types of financial incentive, tax incentives and non-tax incentives, to encourage individuals to save for retirement. Traditional forms of savings are taxed the same way as other income and earnings, with contributions paid from after-tax earnings, the investment income generated taxed, and withdrawals exempted from taxation. This is generally referred to as the “Taxed-Taxed-Exempt” or “TTE” tax regime. Tax incentives for retirement savings arise from deviating from this benchmark. They are indirect subsidies provided through the tax code. By contrast, non-tax incentives, mainly matching contributions and fixed nominal subsidies, are direct government payments. These payments are made by the government directly into the pension account of eligible individuals.

This chapter describes and compares the tax treatment of retirement savings across 42 OECD and selected non-OECD countries. It also examines the extent to which countries use more direct, non-tax financial incentives to promote savings for retirement. It focuses on retirement savings made through funded private pension arrangements.

Many countries apply a variant of the “Exempt-Exempt-Taxed” (“EET”) tax regime to retirement savings, where both contributions and returns on investment are exempt from taxation while benefits are treated as taxable income upon withdrawal. Yet a wide range of tax regimes can be found as well, from the “EEE” tax regime, where contributions, returns on investment and pension income are tax exempt, to regimes where two of three flows are taxed. In addition, in a majority of countries, a disparity of tax treatments exists at the national level between different types of plan, contribution (i.e. mandatory or voluntary) and contribution source (i.e. employer or individual). This complexity may prevent individuals to save for retirement. Consequently, some countries have introduced more direct financial incentives, which this chapter reports as well.

This chapter is organised as follows. Section 2.1 gives a general overview of the tax treatment of retirement savings under the personal income tax system. The following sections then go into more detail regarding the tax treatment of contributions to funded pension plans (Section 2.2), returns on investment and funds accumulated (Section 2.3), and private pension income (Section 2.4). Besides the personal income tax system, social contributions (e.g. those financing public health care insurance, public pensions, unemployment insurance, or disability insurance) may be levied on contributions to funded pension plans and private pension benefits. Section 2.5 therefore describes for each country whether contributions to funded pension plans are excluded from the income base used to calculate social contributions and whether social contributions are levied on private pension income. Section 2.6 presents the different forms of non-tax financial incentives introduced by selected countries to promote savings for retirement. Section 2.7 concludes.

2.1. Overview of the taxation of retirement savings

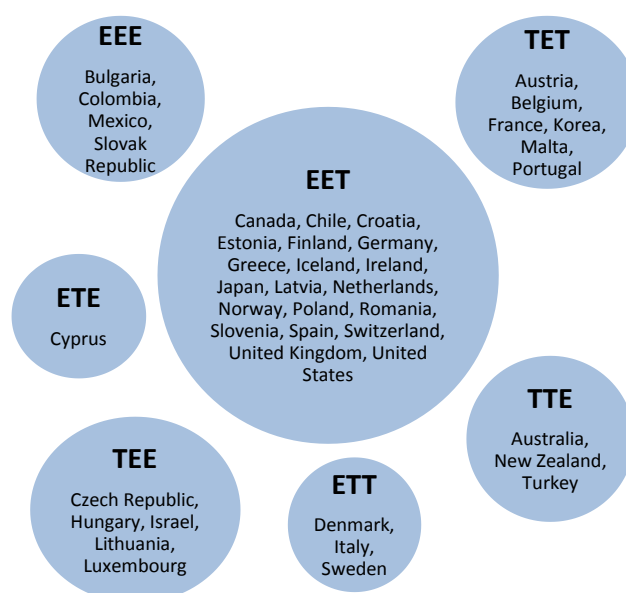
This chapter covers the tax treatment of retirement savings made through all types of funded private pension arrangement, whether mandatory or voluntary, occupational or personal, defined benefit or defined contribution. This section refers to the taxation of retirement savings under the personal income tax system, while Section 2.5 addresses other taxes such as social contributions levied on contributions and pension income.

When providing an overview of the taxation of retirement savings (Figure 2.1), for countries where the tax treatment differs across different types of pension plan, the analysis focusses on the tax treatment of the most common plan. Sections 2.2 to 2.4 then

address cases when different tax rules apply to different types of plan. Second, the analysis treats contributions in occupational pension plans as taxed to employees if either employee or employer contributions are taxed when these two sources of contributions have a different tax treatment. Third, the tax treatment of pension income assumes a case where individuals take an annuity at their official age of retirement. Section 2.4 looks at how different types of post-retirement product and ages of benefit withdrawal affect the tax treatment of pension income.

Half of OECD countries apply a variant of the “Exempt-Exempt-Taxed” (“EET”) tax regime to retirement savings, meaning that both contributions and returns on investment are exempt from taxation, while benefits are treated as taxable income upon withdrawal. Out of 36 OECD countries, 18 follow this tax regime (see Figure 2.1).

Figure 2.1. Overview of the tax treatment of retirement savings in OECD and selected non-OECD countries, 2018



Note: Main pension plan in each country. “E” stands for exempt and “T” for taxed. Countries offering tax credits on contributions are considered as taxing contributions, as the tax credit may not cover the full amount of tax paid on those contributions.^{1 2}

Six other tax regimes can be found among the other countries. Occupational pension plans in Austria, Belgium, France, Korea, Portugal and Malta are taxed according to a “TET” regime, usually with part of the contributions exempt from taxation.³ The Czech Republic, Hungary, Israel, Lithuania and Luxembourg follow a “TEE” regime, where part or all of individuals’ contributions are taxed.

Returns on investment are taxed in three groups of countries. In Denmark, Italy and Sweden, contributions are tax exempt but returns on investment and pension income are taxed. Returns on investment are however not subject to progressive income tax rates but rather to fixed tax rates. In the case of Italy, returns on investment are not subject to double taxation during the accumulation phase and at withdrawal. Only the part of pension income that has not been already taxed during the accumulation phase is taxed at withdrawal. In Australia, New Zealand and Turkey, only pension income is tax exempt.⁴

In Cyprus, interest income earned by provident funds is taxed at the fixed rate of 3% (special contribution for defence).

Finally, four countries have more favourable taxation regimes for pension funds. In Mexico, the Slovak Republic, Bulgaria and Colombia, mandatory contributions to personal pension plans enjoy an “EEE” tax regime, meaning that contributions, returns on investment and pension income are tax-exempt.⁵

Table 2.1 provides more detailed information by country about the tax treatment of contributions, returns on investment and pension income. It disaggregates information between different types of plan, different types of contribution (i.e. mandatory or voluntary) and different sources of contribution (i.e. employer or individual) when these are subject to different tax treatments. Sections 2.2 to 2.4 explain further the information provided in Table 2.1.

Table 2.1. General tax treatment of retirement savings in funded private pensions, 2018

Country	Type of plan / contribution	Source of contribution	Tax treatment		
			Contributions	Returns	Withdrawals
Australia	Concessional contributions	All	0%/15%/30%	0%/15%	E
	Non-concessional contributions	Individual	T	0%/15%	E
Austria	Occupational plans	Individual	T	E	T/PE
	Occupational plans	Employer	E	E	T
	Personal plans	Individual	T	E	T/PE
	State-sponsored retirement provision plans	Individual	T	E	E
Belgium	Pension savings accounts	Individual	30% credit	E	8% of assets
	Occupational plans	Employer	E	9.25%	10% - 16.5%
	“VAPZ” (self-employed)	Individual	E	9.25%	T
	IPT (self-employed with a company)	Individual	E	9.25%	10% - 16.5%
	POZ (self-employed without a company)	Individual	30% credit	9.25%	10%
Canada	All	All	E	E	15% credit
Chile	Mandatory contributions	Individual	E	E	T
	Voluntary contributions, regime A	Individual	T	E	E
	Other voluntary contributions	Individual	E	E	T
Czech Republic	Supplementary plans	Individual	T/PE	E	E
	Supplementary plans	Employer	E	E	E
Denmark	Age savings plans	All	T	15.3%	E
	Other plans	All	E	15.3%	T
Estonia	Mandatory contributions	All	E	E	T
	Voluntary contributions	Individual	20% credit	E	E
Finland	Voluntary personal plans set up by individual	Individual	30% credit	E	30% - 34%
	Other plans	All	E	E	T
France	Article 82	All	T	T/PE	T/PE
	Other occupational plans	Employer	T/PE	E	T/PE
	PERCO plans	Individual	T	T/PE	T/PE
	Other plans	Individual	T/PE	E	T/PE
Germany	Private pension insurance	Individual	T	E	T/PE
	Other plans	All	E	E	T

Country	Type of plan / contribution	Source of contribution	Tax treatment		
			Contributions	Returns	Withdrawals
Greece	Occupational plans and group contracts	All	E	E	T
	Other plans	All	T	E	E
Hungary	All	Individual	T	E	E
	All	Employer	17.7%	E	E
Iceland	All	All	E	E	T
Ireland	All	All	E	E	T/PE
Israel	All	Individual	35% credit	E	E
	All	Employer	E	E	E
Italy	All	All	E	12.5%/20%	T/PE
Japan	All	All	E	E	T/PE
Korea	Occupational plans	Employer	E	E	T/PE
	All	Individual	13.2%/16.5% credit	E	T/PE
Latvia	Mandatory contributions	Individual	E	E	T
	Voluntary contributions	Individual	E	10%	E
	Voluntary contributions	Employer	E	10%	T
Lithuania	"Pillar 2" plans	All	T	E	E
	"Pillar 3" plans	Individual	E	E	E
Luxembourg	Occupational plans	Employer	20%	E	E
	All	Individual	E	E	T/PE
Mexico	Mandatory contributions	All	E	E	E
	Long-term voluntary contributions	Individual	E	E	E
	Short-term voluntary contributions	Individual	T	T	E
Netherlands	All	All	E	E	T
New Zealand	All	All	T	10.5% - 28%	E
Norway	Occupational DC plans	Individual	T/PE	E	T
	Occupational DC plans	Employer	E	E	T
	Individual pension saving	Individual	T/PE	E	T/PE
	Occupational plans for the self-employed	Individual	E	E	T
Poland	OFE plans	Individual	E	E	T
	IKZE plans	Individual	E	E	10%
	PPE and IKE plans	All	T	E	E
Portugal	Occupational plans	Employer	E	E	T
	All	Individual	T/PE	E	T/PE
Slovak Republic	"Pillar 2" plans	Employer	E	E	E
	"Pillar 2" plans	Individual	T	E	E
	"Pillar 3" plans	All	T/PE	19%	E
Slovenia	All	All	E	E	T
Spain	All	All	E	E	T
Sweden	Premium Pension	Individual	E	E	T
	Other plans	All	E	15%	T
Switzerland	All	All	E	E	T
Turkey	Personal plans	All	T	T	E
United Kingdom	All	All	E	E	T/PE

Country	Type of plan / contribution	Source of contribution	Tax treatment		
			Contributions	Returns	Withdrawals
United States	Roth contributions	Individual	T + credit (0% - 50%)	E	E
	Other contributions	All	E + credit (0% - 50%)	E	T
Selected non-OECD countries					
Bulgaria	All	All	E	E	E
Colombia	Mandatory contributions	All	E	E	E
Croatia	Mandatory contributions	Individual	E	E	T/PE
	Voluntary contributions	Individual	T	E	E
	Voluntary contributions	Employer	E	E	E
Cyprus	Provident funds	All	E	3%	E
Malta	All	Individual	15% credit	E	T
	Occupational plans	Employer	E	E	T
Romania	All	All	E	E	T/PE

Note: T = Taxed; E = Exempt (usually up to a limit); T/PE = Taxed but partially exempt; credit = Tax credit.

2.2. Taxation of contributions to funded private pension plans

This section provides more details on the tax treatment of contributions to private pension plans. It reviews cases when the tax treatment varies for different types of plan, different types of contribution (i.e. mandatory or voluntary) or different sources of contribution (i.e. employer or individual). It also reports the limits that apply on contributions attracting tax relief or on the tax deductibility of contributions, as well as the tax treatment of contributions above those limits. Finally, it examines the requirements that must be met in certain countries to become eligible for tax relief on contributions.

Disparity of tax treatments across different types of contribution

Only a minority of OECD countries apply an identical tax treatment across all types of contribution and pension plan. This is the case in 12 OECD countries (Canada, Iceland, Ireland, Italy, Japan, the Netherlands, New Zealand, Slovenia, Spain, Switzerland, Turkey and the United Kingdom) and 4 non-OECD countries (Bulgaria, Colombia, Cyprus and Romania). In these countries, employee and employer contributions, whether voluntary or mandatory, are subject to the same tax treatment. Contributing to a personal or occupational plan does not modify the general tax treatment either, even though different limits may apply to the amount of contributions attracting tax relief.

In Chile, all types of contributions can be deducted from income but workers making voluntary contributions can actually decide whether or not to deduct these contributions from their taxable income. If they do, benefits are considered income for the year the withdrawals are made and are subject to a special additional tax. If they do not deduct contributions, the individual does not have to pay further taxes when the funds are used to complement the mandatory pension.

As shown in Table 2.1, contributions from employers and individuals within the same type of plan are treated differently in the income tax system of Austria, the Czech Republic, France, Hungary, Israel, Korea, Latvia, Luxembourg, Norway, Portugal, the Slovak Republic, Croatia, and Malta. In most of these countries, employer contributions to private pension plans are not considered as taxable income for the individual.⁶ By contrast, individuals' contributions are made from after-tax income and may only enjoy a

partial tax exemption (for example, 20% of overall employee contributions to private pension plans in Portugal are tax deductible) or a tax credit (for example, employee contributions in Israel are subject to a 35% non-refundable tax credit). In Luxembourg, employer contributions are taxed at a fixed rate of 20%, while employee contributions are tax-deductible. In Latvia, employer and employee voluntary contributions are tax deductible, but upon withdrawal, employer contributions are taxed while employee contributions are tax exempt.

The tax treatment may also vary according to the type of plan in which the individual is a member. This is the case in Austria, Belgium, Denmark, Finland, France, Germany, Greece, Lithuania, Norway, Poland, the Slovak Republic, Sweden and the United States. In the Slovak Republic, plans receiving part of the social security contributions attract a different tax treatment than other plans. In Sweden, all plans follow an “ETT” tax regime, except the mandatory personal pension plan system (PPM) in which returns on investment are tax exempt. In the other countries, the difference in the tax treatment is not related to any plan category (occupational or personal, mandatory or voluntary). For example, Poland has two types of supplementary personal pension plan (IKE and IKZE) with two different tax regimes applying (“TEE” and “EET” respectively).

In Australia, Estonia, Latvia, Mexico and Croatia, the important criterion to determine the tax treatment of contributions is whether these contributions are mandatory or voluntary. In Australia, non-concessional contributions are usually voluntary contributions and paid from after-tax income, while concessional contributions are usually mandatory contributions (either paid by the employer or by the individual in case of self-employed workers) and generally taxed at a fixed rate of 15%. In Estonia and Croatia, contributions are tax-exempt in plans receiving part of the social security contributions, while they are taxed in supplementary voluntary personal plans.

The tax rate applied to contributions may depend on the income level of the individual. In the Netherlands, the tax treatment is the same for all types of contribution and pension plan but varies according to the income of the individual member. The maximum income for the “EET” system is set at EUR 105 075 in 2018. For the income that exceeds that limit, a “TEE” system can apply. In Australia, for high-income earners with an adjusted taxable income of more than AUD 250 000, the tax rate on concessional contributions that are considered above the AUD 250 000 threshold is 30% instead of 15%.⁷ In addition, the government refunds the tax paid on concessional contributions for low-income individuals in the form of a matching contribution.⁸ In New Zealand, employers’ contributions are also liable for tax. The tax rate is calculated based on the employee’s salary or wages in the previous tax year (including gross pension employer contribution) and varies between 10.5% and 33%.

Caps or limits to the amount of contributions attracting tax relief

Table 2.2 presents limits to the amount of contributions attracting tax relief and the tax treatment of excess contributions by country. Different limits may apply to different types of contribution within a country.

In only 11 countries, an overall limit applies to the sum of employer and employee contributions to private pension plans (Australia, Canada, Estonia, Italy, Latvia, Mexico, Slovenia, Spain, the United Kingdom, the United States and Romania). In that case, excess contributions, when permitted, are considered as taxable income for the individual and taxed at his/her marginal rate of income tax. In the other countries, employer

contributions are not limited or have separate limits to the ones applying to employee contributions.

In three countries, tax relief is granted only for a part of the contributions made by individuals (the Czech Republic, Norway and Portugal). For example, in Portugal, 20% of overall employee contributions to private pension plans (both occupational and personal) are tax deductible, within age-dependent limits. In the Czech Republic, only contributions above CZK 12 000 per year are tax-deductible.

Partial tax relief can also be granted in the form of a tax credit. Tax credits reduce the amount that the individual owes in tax (in contrast to tax deductions that reduce taxable income). It is calculated as a proportion of the contributions made, up to a limit. Eight countries provide tax credits: Australia, Belgium, Estonia, Finland, Israel, Korea, the United States and Malta. The proportion of contributions used to calculate the tax credit varies from 13.2% in Korea to 35% in Israel. In the case of voluntary personal plans taken by the employees in Finland, the tax credit is provided only if the capital income earned in the year is lower than the amount of deductible contributions. In the United States, the Saver's Credit provides individuals who fall within certain tax brackets with non-refundable tax credits equal to 50%, 20% or 10% of the amount contributed on up to USD 2 000.

Table 2.2. Limits to the amount of contributions attracting tax relief and tax treatment of excess contributions

Country	Type of plan / contribution / source of contribution	Part of contribution attracting tax relief	Contribution limit	Taxation of excess contributions
Australia	Concessional contributions	All	AUD 25 000 per year or AUD 125 000 over a five-year period if total superannuation balance is less than AUD 500 000.	Marginal income tax rate + excess concessional contribution charge
	Non-concessional contributions	No tax relief	Only permitted if total superannuation balance is less than AUD 1 600 000. The limit is AUD 100 000 per year or AUD 300 000 over a three-year period for those aged under 65.	49% tax rate if individuals do not withdraw the excess contributions. If they do, notional earnings on excess contributions are taxed at marginal tax rate.
Austria	Direct insurance, employer	All	EUR 300	Marginal income tax rate
Belgium	Pension savings accounts, ordinary	Tax credit: 30%	EUR 960	Marginal income tax rate
	Pension savings accounts, dual	Tax credit: 25%	EUR 1 230	Marginal income tax rate
	Long-term savings individual life insurance	Tax credit: 30%	EUR 2 310	Marginal income tax rate
	Occupational pension plans	All for employers; 30% tax credit for employees	Total retirement benefits, including the statutory pension, should not exceed 80% of the last gross annual salary	Marginal income tax rate
	VAPZ	All	8.17% of professional income, up to EUR 3 187.04. For "social" VAPZ: 9.40% of professional income, up to EUR 3 666.85	Excess contributions are not permitted
	IPT	All	Total retirement benefits, including the statutory pension, should not exceed 80% of the last gross annual salary	Marginal income tax rate
	POZ	Tax credit: 30%	Total retirement benefits, including the statutory pension, should not exceed 80% of the last gross annual salary	Marginal income tax rate

Country	Type of plan / contribution / source of contribution	Part of contribution attracting tax relief	Contribution limit	Taxation of excess contributions
Canada	Registered Retirement Savings Plans (RRSP)	All	Employee + employer contributions: 18% of earnings up to CAD 26 230 minus actual or estimated RPP contributions	Marginal income tax rate + penalty tax of 1% per month for excess over-contributions made to an RRSP or a PRPP (i.e. contributions in excess of CAD 2 000 over the applicable RRSP/PRPP limit).
	Pooled Registered Pension Plans (PRPP)	All	Contributions must be made within an individual's available RRSP limit	See RRSP
	Registered pension plans (RPP) - DC	All	Employee + employer contributions: 18% of earnings up to CAD 26 500	Excess contributions are not permitted
	Deferred Profit-Sharing Plans (DPSP)	All	Employee + employer contributions: 18% of earnings up to one-half of the RPP limit (CAD 13 250).	Excess contributions are not permitted
Chile	Mandatory contributions	All	78.3 UF (<i>Unidad de Fomento</i> in Spanish, a price-indexed unit of account)	Excess contributions are not permitted
	Agreed deposits	All	900 UF	Marginal income tax rate
	Voluntary contributions, regime B	All	50 UF per month or 600 UF per year	Marginal income tax rate
Czech Republic	Individual	> CZK 12 000 / year	CZK 24 000 per year	Marginal income tax rate
	Employer	All	CZK 50 000 per year	Marginal income tax rate
Denmark	Programmed withdrawals	All	DKK 54 700	Marginal income tax rate
	Age savings	No tax relief	DKK 5 100; The last five years before retirement age, the contribution limit is increased to DKK 46 000 per year	Excess contributions are not permitted
Estonia	Voluntary contributions	Tax credit: 20%	Maximum tax credit: 15% of gross income up to EUR 6 000. The EUR 6 000 limit is common to employee and employer contributions, so that any employer contribution reduces the available room for individual contribution entitled to the tax credit	Flat income tax rate (20%)
Finland	Voluntary occupational plans	All	5% of salary up to EUR 5 000 per year	If the employee contributes more than the employer does, the excess amount is not deductible
	Voluntary personal plans set up by the employer	All for employer contributions. No tax relief for employee contributions	Employer contributions: EUR 8 500 per year	Marginal income tax rate
	Voluntary personal plan taken by the individual	Deductible from capital income	EUR 5 000 per year or EUR 2 500 if the employer also provides and contributes to a voluntary personal plan for its employees. Tax credit of 30% on the excess if capital income is too low	Marginal income tax rate
France	Article 83 and company retirement savings plans (PERE)	All	8% of gross earnings, with gross earnings capped at 8 times the annual social security ceiling	Marginal income tax rate
	Article 83, PERE, popular retirement savings plans (PERP) and PREFON	All	Common limit for voluntary contributions: 10% of gross earnings of the previous year, with gross earnings capped at 8 times the annual social security ceiling	Marginal income tax rate
	Collective retirement savings plans	All for employer contributions. No	Employer contributions: 16% of the annual social security ceiling and 3 times the	Marginal income tax rate

Country	Type of plan / contribution / source of contribution	Part of contribution attracting tax relief	Contribution limit	Taxation of excess contributions
	(PERCO)	tax relief for employee contributions	employee contributions; Employee contributions: 25% of gross earnings of the previous year	
	Madelin contracts	All	Depends on taxable profit, minimum 10% of the annual social security ceiling, maximum 10% of 8 times the annual social security ceiling plus 15% of 7 times the annual social security ceiling	Marginal income tax rate
Germany	Pension funds and direct insurance	All	8% of the social security contribution ceiling	Marginal income tax rate
	Riester plans	All	EUR 2 100 per year (including the subsidy)	Marginal income tax rate
	Basisrente plans	All	From 2025: The maximum contribution to the miners' statutory pension scheme	Marginal income tax rate
Greece	Occupational plans and group contracts	All	No limit	
Hungary	Individual	No tax relief		
Iceland	Individual	All	4% of taxable income	Marginal income tax rate
Ireland	Individual	All	Between 15% of earnings for individuals younger than 30 and 40% of earnings for individuals 60 and older, with earnings capped at EUR 115 000	Excess contributions are not permitted
Israel	Individual	Tax credit: 35%	Contributions are subject to a cap at 20.5% of twice the national average salary	Marginal income tax rate
	Employer	All	Maximum tax credit: 7% of the salary 7.5% of the salary, with a cap on gross salary of 2.5 times the national average salary for employees and 16.5% of the national average salary for self-employed people	Marginal income tax rate
Italy	All	All	Employee + employer contributions: EUR 5 164.57 per year. Employees who got their first job since 1 January 2007 are entitled to recoup the unused annual tax relief of their first five years of participation in a pension scheme, up to the limit of 50% of the maximum annual relief. The recoupment may take place in the 20 years following the first five years of participation.	Marginal income tax rate
Japan	Individual-type DC plans	All	Employees: between JPY 12 000 and JPY 23 000 per month depending on whether the employer sponsors a plan and what type of plan; Self-employed workers: JPY 68 000 per month	Excess contributions are not permitted
	DC corporate plans	All	Employer: JPY 330 000 or JPY 660 000 per year and per employee depending on whether the employer also sponsors a DB plan	Excess contributions are not permitted
	DB corporate plans	All	JPY 40 000 per year	Excess contributions are not permitted
Korea	Individual	Tax credit: 13.2% or 16.5%	The maximum level of contributions taken into account for the calculation of the tax credit varies between KRW 4 000 000 and KRW 7 000 000 per year depending on the type of plan in which the individual contributes	Marginal income tax rate
Latvia	Voluntary contributions	All	Employee + employer contributions: 10% of annual taxable income, up to EUR 4 000	Marginal income tax rate

Country	Type of plan / contribution / source of contribution	Part of contribution attracting tax relief	Contribution limit	Taxation of excess contributions
			per year	
Lithuania	Voluntary contributions	All	25% of taxable income up to EUR 2 000 per year	Flat income tax rate (15%)
Luxembourg	Employer	All	20% of salary	Excess contributions are not permitted
	Individual	All	EUR 1 200 in occupational pension plans and EUR 3 200 in personal pension plans	Marginal income tax rate
Mexico	Complementary contributions	All	10% of taxable income up to 5 times the annual minimum wage.	Marginal income tax rate
	Long-term voluntary contributions	All	10% of taxable income up to 5 times the annual minimum wage.	Marginal income tax rate
	Contributions to special "savings for retirement" accounts	All	MXN 152 000	Marginal income tax rate
	Occupational plans	All	Employee + employer contributions: 12.5% of salary	Marginal income tax rate
	Voluntary personal plans	All	10% of taxable income up to 5 times the annual minimum wage	Marginal income tax rate
Netherlands	Occupational DC plans	All	"EET" system: between 3.2% to 4.6% of the salary minus a threshold for the public pension for employees aged 15 to 19 and 22.3% to 27.3% for employees aged 65 to 67; "TEE" system: between 2.2% for employees aged 15 to 19 and 13.1% for employees aged 65 to 67	Marginal income tax rate
	Personal plans	All	13.3% of the annual income up to EUR 105 075 minus a threshold for the public pension	Marginal income tax rate
New Zealand	All	No tax relief		
Norway	Occupational DC plans, individual	Deductible from ordinary income	2% of salary in municipal and public sector DB plans; 4% of salary in private sector plans	Excess contributions are not permitted
	Occupational plans for the self-employed	Deductible from ordinary and personal income	6% of imputed personal income from self-employment between 1 and 12 G	Marginal income tax rate
	Individual pension saving	Deductible from ordinary income	NOK 40 000	Marginal income tax rate
Poland	IKZE	All	1.2 times the national projected average monthly salary	Excess contributions are not permitted
	PPE	All	4.5 times the national projected average monthly salary	Excess contributions are not permitted
	IKE	All	3 times the national projected average monthly salary	Excess contributions are not permitted
Portugal	Individual	20%	Tax-deductibility limit: EUR 400 per year under 35 years old, EUR 350 between 35 and 50 years old, and EUR 300 above 50 years old	Marginal income tax rate
Slovak Republic	Pillar 3 plans	All	Employee contributions: EUR 180	Marginal income tax rate
Slovenia	All	All	Employee + employer contributions: 5.844% of gross salary up to EUR 2 819.09 per year	Marginal income tax rate
Spain	All	All	Employee + employer contribution limit: EUR 8 000. Tax-deductibility limit: 30% of earnings up to EUR 8 000	Excess contributions are not permitted
Sweden	Voluntary personal	All	35% of eligible income up to 10 basic	Marginal income tax rate

Country	Type of plan / contribution / source of contribution	Part of contribution attracting tax relief	Contribution limit	Taxation of excess contributions
			amounts per year	
Switzerland	Personal plans	All	If the individual has an occupational pension scheme: CHF 6 768; If not: 20% of annual earnings up to CHF 33 840	Excess contributions are not permitted
Turkey	Personal plans	No tax relief		
United Kingdom	All	All	Employee + employer contributions: 100% of the individual's income up to GBP 40 000	Marginal income tax rate
United States	401(k) and 403(b) plans	All	Employee + employer contributions: 100% of earnings up to USD 55 000	Marginal income tax rate
	457(b) plans	All	Employee + employer contributions: 100% of earnings up to USD 18 500	Marginal income tax rate
	Simplified Employee Pension Plans (SEP)	All	Employee + employer contributions: 25% of earnings up to USD 55 000	Marginal income tax rate
	SIMPLE IRA	All	Employee contributions: USD 12 500; Employer contributions: 100% match up to 3% of compensation or 2% of compensation	Marginal income tax rate
	Individual Retirement Accounts (IRA)	All	100% of taxable earnings up to USD 5 500	6% per year, as long as the excess amounts remain in the plan
Selected non-OECD countries				
Bulgaria	Voluntary individual contributions	All	10% of annual taxable income	Flat income tax rate (10%)
	Voluntary employer contributions	All	BGN 60 per month	Flat income tax rate (10%)
Colombia	Voluntary contributions	All	30% of the employee's employment income or COP 125 992 800 annually	Marginal income tax rate
Croatia	Voluntary employer contributions	All	HRK 6 000 a year	Marginal income tax rate
Cyprus	Provident funds	All	1/6th of annual income	Marginal income tax rate
Malta	Personal plans	Tax credit: 15%	Maximum tax credit: EUR 150 per year	Marginal income tax rate
Romania	Voluntary contributions	All	Employee + employer contributions: 15% of gross earnings; Employee contributions are tax deductible up to EUR 400 per year	Flat income tax rate (10%)

Limits to the amount of contributions attracting tax relief can be defined as a proportion of the individual's income. This limit is usually subject to a maximum amount in national currency in order to put a ceiling on the tax relief granted to high-income earners. Such a definition of limits is used in Belgium, Canada, Estonia, Finland, France, Germany, Iceland, Ireland, Israel, Latvia, Lithuania, Luxembourg, Mexico, the Netherlands, Norway, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, the United States, Bulgaria, Colombia, Cyprus and Romania. For example, employee contributions to voluntary occupational plans in Finland are deductible from the employee's earned income up to the lesser of (i) 5% of salary or (ii) EUR 5 000 per year.

By contrast, the limit to the amount of contributions attracting tax relief can be defined as a fixed amount in national currency, usually a multiple of a reference value in the country. Such a definition of limits can be found in Australia, Austria, Belgium, Chile, the Czech Republic, Denmark, Finland, France, Germany, Italy, Japan, Korea, Luxembourg, Mexico, Norway, Poland, Portugal, the Slovak Republic, Switzerland, Bulgaria, Croatia, Malta and Romania.

Finally, in a majority of countries, excess contributions are taxed at the individual's marginal tax rate. They are subject to a specific tax rate in Australia, Canada (for Registered Retirement Savings Plans) and the United States (for Individual Retirement Accounts, IRAs). Excess contributions are not permitted for certain types of plan in Belgium, Canada, Chile, Denmark, Ireland, Japan, Luxembourg, Norway, Poland, Spain and Switzerland.

Eligibility criteria for tax relief on contributions

In most countries, people not paying income taxes do not get any relief on their contributions into private pension plans. The United Kingdom is an exception, as individuals not paying taxes can benefit from basic rate tax relief (20%) under the relief at source mechanism.

People with an income above a certain threshold cannot claim a deduction on their pension contributions at all in the United States for IRAs (USD 73 000 per year for a single individual also participating in an occupational pension plan).

Tax relief on contributions may be granted until a certain age. The age limit to be eligible for tax relief on contributions is 65 years old in Belgium (for personal plans) and 75 years old in the United Kingdom. Individuals aged over 75 cannot make voluntary deductible contributions in Australia.

Finally, plan members may be eligible for tax relief on contributions if they comply with certain rules, such as:

- contributing for a minimum period: ten years in Belgium (for personal plans), five years in Estonia (for voluntary personal plans), ten years in Luxembourg;
- not retiring before a certain age: 62 in Belgium (for occupational plans), the maximum statutory age in Finland (currently varying between 68 and 70 years depending on the age of the insured person), 62 in Germany (in principle for Riester pension plans and Basisrente plans), 60 in Luxembourg, 55 in Sweden (for voluntary personal plans);
- taking benefits in a certain form: minimum withdrawal period of ten years in Finland (for personal plans), monthly lifelong payments in Germany (for Basisrente plans), at least two-thirds of the benefits paid as an annuity in Portugal (for occupational plans), minimum withdrawal period of five years as an annuity in Sweden (for voluntary personal plans).

2.3. Taxation of returns on investment and of the funds accumulated

Taxation of returns on investment

Most countries exempt from taxation returns on investment in private pension plans (see Table 2.1). Returns on investment are taxed, for some or all types of pension plan, contribution (voluntary or mandatory) and contribution source (employee and employer), in 12 countries (Australia, Belgium, Denmark, France, Italy, Latvia, Mexico, New Zealand, the Slovak Republic, Sweden, Turkey and Cyprus).

In Australia, investment earnings on pension assets are taxed at a rate of 15% during the accumulation phase. During the pay-out phase, investment earnings are tax free, except when the amount of assets that has been transferred to a retirement phase account exceeds

AUD 1 600 000. In addition, funds are eligible for imputation credits for dividend income and for a one-third capital gains tax reduction on assets held for at least 12 months.

The taxation of returns on investment depends on the type of asset classes in Italy. Investment income from pension funds is taxed at a 20% standard rate, but income from government bonds held by the pension fund is taxed at a more favourable rate of 12.5%.

A fixed tax rate applies to returns on investment in Belgium (9.25%), Denmark (15.3%), Latvia (10%), Sweden (15%) and Cyprus (3%). In the case of Sweden, the 15% tax rate applies on an imputed return on investment rather than on the actual return on investment generated by the assets of the pension plan. The imputed return corresponds to the previous year's average government borrowing rate, but it cannot be negative.

In France, Mexico, the Slovak Republic and Turkey, returns are taxed when the individual retires and not during the accumulation phase. The part of pension income originated from returns is taxed separately. In France, returns on investment in PERCO plans are subject to social taxes at the rate of 17.2% upon withdrawal if the individual chooses a lump sum (the lump sum is divided into a "capital component" and a "return on capital component", and only the "return on capital component" is subject to the 17.2% tax). In Mexico, the real interest earned from investing short-term voluntary contributions are considered as taxable income upon withdrawal. In the Slovak Republic, returns on investment in supplementary pension plans (pillar 3) are taxed at the rate of 19% upon withdrawal (only the part of pension income originated from returns is taxed). In Turkey, only the part of pension income originated from returns is taxed upon withdrawal and the tax rate depends on the age at withdrawal (younger or older than 56 years old) and on the length of membership in the plan (more or less than ten years).

Finally, in New Zealand, the taxation of investment income depends on the type of scheme and on the taxable income of the plan member. If the scheme is an occupational pension plan, investment earnings are taxed at 28%. If the scheme is a Portfolio Investment Entity (e.g. all KiwiSaver default schemes), the tax rate for investment earnings varies from 10.5% for taxable income equal to or below NZD 14 000 to 28% for taxable income higher than NZD 48 000.

Taxation of funds accumulated

Some countries tax the total amount of funds accumulated (which includes returns on investment and past contributions) during the accumulation period. Belgium and Japan are the only two countries imposing a tax on assets accumulated in private pension plans. In Belgium, there is an 8% tax on the lump sum received from pension savings accounts (third pillar). This tax basically replaces the tax on withdrawals. If the pension savings account was opened when the individual was younger than 55, the tax is due at age 60 on the capital accumulated until then. If the pension savings account was opened when the individual was 55 or older, the tax is due when the contract has been in place for 10 years on the capital accumulated until then. In Japan, assets in Employees' Pension Funds (EPFs), DB and DC plans are taxed at an annual rate of 1.173%. However, this tax has been paused since 1999.

Other countries tax the total amount of funds accumulated once it exceeds a lifetime limit. Australia, Ireland and the United Kingdom do this when the individual retires. In Australia, the limit, called the transfer balance cap, is currently AUD 1 600 000 and is indexed annually in line with the consumer price index. It restricts the amount of superannuation assets that an individual can transfer to a retirement phase account, i.e. an

account supporting retirement income streams with tax-free investment earnings. Assets in excess of the transfer balance cap must be rolled back to an accumulation phase account, where investment earnings will be taxed at 15%, or withdrawn from the plan. Transfers in excess of the limit are subject to a 15% excess transfer balance tax. In Ireland, the limit has been set at EUR 2 million since 1 January 2014. Upon withdrawal, the amount of assets in excess of this limit is subject to an upfront income tax charge at the higher rate of income tax (currently 40%). The limit in the United Kingdom is currently set at GBP 1.03 million and is indexed annually by the consumer price index. Individuals building up pension savings worth more than the limit pay a tax charge on the excess upon withdrawal. The rate depends on how this excess is paid to the individual. If the amount over the limit is paid as a lump sum, the rate is 55%. If it is paid as an annuity, the rate is 25%.

2.4. Taxation of pension income

Distinct tax treatments of pension income according to the post-retirement product

As shown in Table 2.3, the tax treatment of pension income is identical across different types of post-retirement product in 17 OECD countries (Denmark, Finland, Germany, Greece, Iceland, Italy, Latvia, Lithuania, the Netherlands, New Zealand, Norway, Poland, the Slovak Republic, Slovenia, Sweden, Turkey, and the United States) and 5 non-OECD countries (Bulgaria, Colombia, Croatia, Cyprus and Romania).⁹

Lump sums may be tax free up to a certain amount or may be only partially taxed. This tax treatment for lump sums can be found in Australia (if withdrawn after the preservation age), Chile (provided the individual can finance a certain minimum benefit with the assets accumulated), Denmark (for age savings plans), France, Hungary (provided the account has been opened for a long enough period), Ireland, Israel, Korea, Latvia, Lithuania (provided the account has been opened for at least five years and withdrawal is not earlier than five years before the statutory retirement age), Luxembourg, Mexico, New Zealand, Poland (for PPE and IKE plans), Portugal, the Slovak Republic, Spain (for people who have contributed before 2007), Switzerland, the United Kingdom, the United States (Roth contributions), Bulgaria (if the annuity payment from universal pension funds is less than 20% of the public social retirement pension), Colombia, Cyprus and Malta. Compared to annuities and programmed withdrawals, lump sum payments can be quite large, potentially increasing the individual's marginal income tax rate the year of withdrawal. Allowing for a partial tax exemption of lump sums (while annuities and programmed withdrawals are fully taxed as income), may help reaching a more neutral tax treatment across the different post-retirement products.

Only two OECD countries incentivise people to annuitize their pension income through a more favourable tax treatment for annuities as compared to programmed withdrawals. In the Czech Republic, annuities are always tax-exempt, while programmed withdrawals are tax-exempt only when they are paid for at least a duration of ten years (otherwise, they are taxed as income). In Estonia, pension payments from voluntary pension plans from age 55 are tax free for life annuities and taxed at a rate of 10% for programmed withdrawals. It is also worth mentioning that many countries do not allow pension payments as programmed withdrawals.

Finally, early withdrawals are taxed less favourably in some countries. The age limit defining early withdrawals differ in each country and there may be more than one limit to

define different tax treatments. For example, in Australia, annuities are taxed at the individual's marginal tax rate before the preservation age, there is a 15% tax offset between the preservation age and 59 years old, and annuities up to AUD 100 000 per year are tax free from age 60. Other countries distinguishing the tax treatments for early withdrawals include Belgium, Denmark, Estonia, France (PERCO and article 82 plans), Italy, Lithuania (voluntary contributions), Turkey, the United Kingdom and the United States.

Table 2.3. Tax treatment of pension income according to the post-retirement product

Country	Type of plan / contribution / source of contribution	Annuities	Programmed withdrawals	Lump sums
Australia	Concessional contributions	- Before preservation age (PA): Taxed at marginal rate - PA to 59: Taxed at marginal tax rate less 15% tax offset - From 60: Exempt up to AUD 100 000 per year, then 50% is taxed at marginal tax rate	- Before PA: Taxed at marginal rate - PA to 59: Taxed at marginal tax rate less 15% tax offset - From 60: Exempt up to AUD 100 000 per year, then 50% is taxed at marginal tax rate	- Before PA: Taxed at min {20%; marginal tax rate} - PA to 59: Exempt up to AUD 200 000, then taxed at min {15%; marginal tax rate} - From 60: Exempt
	Non-concessional contributions	Exempt	Exempt	Exempt
Austria	Occupational – Employer	Taxed at marginal rate	Not allowed	Taxed at marginal rate
	Occupational – Individual	Only 25% taxed at marginal rate	Not allowed	Only 25% taxed at marginal rate
	State-sponsored retirement provision	Exempt	Not allowed	27.5% tax on capital gains and 50% of the state subsidies have to be paid back
	Other personal plans	Taxed at marginal rate from the moment the total value of benefits paid exceeds the capital value of the pension at retirement	Not allowed	Taxed at marginal rate from the moment the total value of benefits paid exceeds the capital value of the pension at retirement
Belgium	Pension savings accounts	Not allowed	Not allowed	Taxed at 8% of the assets accumulated up to age 60
	Long-term savings individual life insurance	Not allowed	Not allowed	Taxed at 10% of the assets accumulated up to age 60
	Occupational pension plans	Taxed at marginal rate (rare option)	Not allowed	- Part of the capital from the employer's contributions: 16.5% or 10% if the individual withdraws from the statutory age of retirement + municipal tax - Part of the capital from the employee's contributions: 10% + municipal tax
	VAPZ	Not allowed	Not allowed	The accumulated capital is converted into a virtual income that is then taxed at the marginal rate. The virtual income is determined by applying a conversion rate to the accumulated capital (4% or 4.5%) and has to be declared during a certain period (13 years)

Country	Type of plan / contribution / source of contribution	Annuities	Programmed withdrawals	Lump sums
Canada	IPT	Not allowed	Not allowed	or 10 years) Taxed at 16.5% or 10% if the individual withdraws from the statutory age of retirement + municipal tax
	POZ	Not allowed	Not allowed	Taxed at 10% + municipal tax
	All	Taxed at marginal rate. A non-refundable 15% tax credit is provided on the first CAD 2 000 of eligible pension income	Taxed at marginal rate. A non-refundable 15% tax credit is provided on the first CAD 2 000 of eligible pension income	Taxed at marginal rate
Chile	Mandatory contributions	Taxed at marginal rate	Taxed at marginal rate	Exempt up to 200 UTM (monthly taxation unit) annually provided that the individual can finance a certain minimum benefit
	Voluntary contributions, regime B Voluntary contributions, regime A	Taxed at marginal rate plus special additional tax at the time of withdrawal Exempt	Taxed at marginal rate plus special additional tax at the time of withdrawal Exempt	Taxed at marginal rate plus special additional tax at the time of withdrawal Exempt
Czech Republic	All	Exempt	- Exempt if for more than 10 years - Taxed at marginal rate otherwise	Flat tax rate (15%) on returns and employer contributions
Denmark	Age savings plans	Exempt	Exempt	Exempt
	Other plans	- Early withdrawal: Taxed at 60% - At retirement: Taxed at marginal rate	- Early withdrawal: Taxed at 60% - At retirement: Taxed at marginal rate	Not allowed
Estonia	Mandatory contributions	Taxed at flat rate (20%)	Taxed at flat rate (20%)	Taxed at flat rate (20%)
	Voluntary contributions	- Before 55: Taxed at 20% - From 55: Exempt	- Before 55: Taxed at 20% - From 55: Taxed at 10%	- Before 55: Taxed at 20% - From 55: Taxed at 10%
Finland	Voluntary personal plans taken by individuals	Taxed as capital income (30%) up to EUR 30 000; Excess taxed at 34%	Taxed as capital income (30%) up to EUR 30 000; Excess taxed at 34%	Taxed as capital income (30%) up to EUR 30 000; Excess taxed at 34%
	Other plans	Taxed at marginal rate	Taxed at marginal rate	Taxed at marginal rate
France	Article 83, PERE, PREFON and Madelin contracts	Taxed at marginal rate after a 10% deduction + 10.1% social taxes	Not allowed	Not allowed
	Article 39	Taxed at marginal rate after a 10% deduction + 10.1% social taxes + additional tax (rate depends on monthly pension)	Not allowed	Not allowed
	PERCO	- Before 50: 70% taxed at marginal rate + 17.2% social taxes - 50 to 59: 50% taxed at marginal rate + 17.2% social taxes - 60 to 69: 40% taxed at marginal rate + 17.2% social taxes - From 70: 30% taxed at marginal rate + 17.2% social taxes	Not allowed	Only return on capital component taxed at 17.2% social taxes

Country	Type of plan / contribution / source of contribution	Annuities	Programmed withdrawals	Lump sums
	Article 82	- Before 50: 70% taxed at marginal rate + 17.2% social taxes - 50 to 59: 50% taxed at marginal rate + 17.2% social taxes - 60 to 69: 40% taxed at marginal rate + 17.2% social taxes - From 70: 30% taxed at marginal rate + 17.2% social taxes	Not allowed	Only return on capital component above EUR 4 600 taxed at 7.5% (12.8% if total premiums exceed EUR 150 000) + 17.2% social taxes
	PERP	Taxed at marginal rate after a 10% deduction + 10.1% social taxes	Not allowed	Taxed at marginal rate after a 10% deduction + 8.5% social taxes (other fiscal options available if more advantageous for the individual)
Germany	Private pension insurance	Only return on capital component taxed at marginal rate	Only return on capital component taxed at marginal rate	Only return on capital component taxed at marginal rate (only 50% taxed if the contract has been held for at least 12 years and the recipient is at least 62 years old)
	Other plans	Taxed at marginal rate	Taxed at marginal rate	Taxed at marginal rate
Greece	Occupational plans and group contracts	Taxed at marginal rate	Taxed at marginal rate	Taxed at marginal rate
	Other plans	Exempt	Exempt	Exempt
Hungary	Voluntary private pension funds	Account opened from 01/01/2013: Exempt after 10 years of membership	Account opened from 01/01/2013: Exempt after 10 years of membership	Account opened from 01/01/2013: Gradual reduction of the portion of withdrawals taxed at flat rate (15%) between 10 and 20 years of membership (Exempt after 20 years of membership)
	Other plans	Exempt after 10 years of membership	Exempt after 10 years of membership	Exempt after 10 years of membership, except for withdrawals before the retirement age that are taxable at flat rate (15%) + 19.5% health care tax (the base of the tax and the contribution is 78%)
Iceland	All	Taxed at marginal rate	Not allowed	Not allowed
Ireland	All	Taxed at marginal rate	Taxed at marginal rate	- Below EUR 200 000: Exempt - EUR 200 001 to EUR 500 000: Taxed at 20% - Above EUR 500 000: Taxed at marginal rate
Israel	All	- Below the entitled annuity (NIS 8 380 monthly): Exempt - Above: Taxed at marginal rate	Not allowed	Exempt up to NIS 739 116 provided that the individual can finance a minimum annuity of NIS 4 418 monthly
Italy	All	Taxed at 15% with a reduction of 0.3% for every year of participation after 15 years (max reduction 6%). Taxation is applied on the pension benefit	Not allowed	- Early withdrawal: Generally taxed at 23% - At retirement: Taxed at 15% with a reduction of 0.3% for every year of participation after

Country	Type of plan / contribution / source of contribution	Annuities	Programmed withdrawals	Lump sums
		net of the part that was already taxed in the accumulation phase		15 years (max reduction 6%). Taxation is applied on the pension benefit net of the part that was already taxed in the accumulation phase
Japan	All	Taxed at marginal rate after a deduction which depends on total pension income (including public pensions)	Taxed at marginal rate after a deduction which depends on total pension income (including public pensions)	Taxed at marginal rate
Korea	Employer contributions	70% of the tax due in the case of a lump sum withdrawal	Not allowed	Taxed at marginal rate after deductions related to the number of years of service and the income level
	Individual contributions and returns	- Total retirement income ≤ KRW 12 million: Taxed at a rate that varies from 3.3% to 5.5% depending on the age of the annuitant - Total retirement income > KRW 12 million: Taxed at marginal rate	Not allowed	Taxed at 16.5% (including local income tax), except when contributions did not enjoy the tax credit (exempt)
Latvia	Mandatory contributions	Taxed at marginal rate	Taxed at marginal rate	Taxed at marginal rate
	Voluntary – Employer	Taxed at marginal rate	Taxed at marginal rate	Taxed at marginal rate
	Voluntary - Individual	Exempt	Exempt	Exempt
Lithuania	Mandatory contributions	Exempt	Not allowed	Not allowed
	Voluntary contributions	- If the contract duration has been at least 5 years and the individual withdraws no more than 5 years before the statutory age of retirement: Exempt - Otherwise: Taxed at flat rate (15%) excluding the part of contributions that have not been deducted from taxable income	- If the contract duration has been at least 5 years and the individual withdraws no more than 5 years before the statutory age of retirement: Exempt - Otherwise: Taxed at flat rate (15%) excluding the part of contributions that have not been deducted from taxable income	- If the contract duration has been at least 5 years and the individual withdraws no more than 5 years before the statutory age of retirement: Exempt - Otherwise: Taxed at flat rate (15%) excluding the part of contributions that have not been deducted from taxable income
Luxembourg	Occupational plans	Only the part from the insured period before 01/01/2000 is taxed at marginal rate	Not allowed	Only the part from the insured period before 01/01/2000 is taxed at marginal rate
Mexico	Personal plans	Only 50% taxed at marginal rate	Not allowed	Taxed at half the marginal rate
	Short-term voluntary contributions	Not allowed	Not allowed	Exempt
	Other plans	- Below 15 times the annual minimum wage: Exempt - Above: Taxed at marginal rate	- Below 15 times the annual minimum wage: Exempt - Above: Taxed at marginal rate	- Below 90 times the daily minimum wage annually: Exempt - Above: Taxed at average rate
Netherlands	Up to EUR 105 075	Taxed at marginal rate	Not allowed	Not allowed with the exception of small pensions (taxed at marginal rate)
	Above EUR 105 075	Exempt	Not allowed	Exempt
New Zealand	All	Exempt	Exempt	Exempt
Norway	Occupational DC	Taxed at marginal rate as both	Taxed at marginal rate as both	Not allowed

Country	Type of plan / contribution / source of contribution	Annuities	Programmed withdrawals	Lump sums
	plans	ordinary and personal income	ordinary and personal income	
	Individual pension saving	Taxed at marginal rate as ordinary income	Taxed at marginal rate as ordinary income	Not allowed
Poland	OFE plans	Taxed at marginal rate	Not allowed	Not allowed
	IKZE plans	Taxed at 10%	Taxed at 10%	Taxed at 10%
	PPE and IKE plans	Exempt	Exempt	Exempt
Portugal	Employer	Taxed at marginal rate	Not allowed	- 1/3 of the capital component is exempt from taxation up to a maximum of EUR 11 704.70. The remainder is taxed at marginal rate - The return on capital component is taxed at 4% or 8%
	Individual	- Capital component: Exempt - Return on capital component: Taxed at marginal rate	Not allowed	- Capital component: Exempt - Return on capital component: Taxed at 4% or 8%
Slovak Republic	Pillar 2 plans	Exempt	Exempt	Exempt
	Pillar 3 plans	Only return on capital component taxed at 19%	Only return on capital component taxed at 19%	Only return on capital component taxed at 19%
Slovenia	All	Taxed at marginal rate	Taxed at marginal rate	Taxed at marginal rate
Spain	All	Taxed at marginal rate	Not allowed	40% of pension income arising from contributions made before 2007 can be taken as a lump sum and Exempt, otherwise taxed at marginal rate
Sweden	All	Taxed at marginal rate	Not allowed	Not allowed
Switzerland	All	Taxed at marginal rate	Taxed at marginal rate	Taxed as capital income (1/5 of the income tax which could be generated if lump sums were separately taxed as income)
Turkey	Personal plans	Only return on capital component taxed: - At 5% if withdrawal from 56 years old and the contract duration has been at least 10 years - At 10% if withdrawal before 56 years old and the contract duration has been at least 10 years - At 15% if the contract duration has been less than 10 years	Only return on capital component taxed: - At 5% if withdrawal from 56 years old and the contract duration has been at least 10 years - At 10% if withdrawal before 56 years old and the contract duration has been at least 10 years - At 15% if the contract duration has been less than 10 years	Only return on capital component taxed: - At 5% if withdrawal from 56 years old and the contract duration has been at least 10 years - At 10% if withdrawal before 56 years old and the contract duration has been at least 10 years - At 15% if the contract duration has been less than 10 years
United Kingdom	All	- Taxed at marginal rate - Pension savings accessed before the normal minimum pension age (currently age 55) are charged a 55% rate	- Taxed at marginal rate - Pension savings accessed before the normal minimum pension age (currently age 55) are charged a 55% rate	- Up to 25% of the total value of assets accumulated: Exempt - Above: Taxed at marginal rate - Pension savings accessed before the normal minimum pension age (currently age 55) are charged a 55% rate
United States	Roth contributions Other plans	Exempt - Before 59.5: Taxed at marginal rate + 10% extra tax - From 59.5: Taxed at marginal rate	Exempt - Before 59.5: Taxed at marginal rate + 10% extra tax - From 59.5: Taxed at marginal rate	Exempt - Before 59.5: Taxed at marginal rate + 10% extra tax - From 59.5: Taxed at marginal rate
Selected non-OECD countries				
Bulgaria	All	Exempt	Exempt	Exempt

Country	Type of plan / contribution / source of contribution	Annuities	Programmed withdrawals	Lump sums
Colombia	All	Exempt up to 1 000 UVT	Exempt up to 1 000 UVT	Exempt up to 1 000 UVT
Croatia	Mandatory contributions	Taxed: 50% of the tax that would be generated if pension income was taxed as employment income	Not allowed	Not allowed
	Voluntary contributions	Exempt	Exempt	Exempt
Cyprus	Provident funds	Not allowed	Not allowed	Exempt
Malta	All	Taxed at marginal rate	Taxed at marginal rate	- Up to 30% of the total value of assets accumulated: Exempt - Above: Taxed at marginal rate
Romania	All	Not allowed	Taxed at flat rate (10%) above RON 2 000 of total pension income (including public pensions)	Taxed at flat rate (10%) above RON 2 000 of total pension income (including public pensions)

Interaction with the tax treatment of public pensions

Pension income paid by public pay-as-you-go pension schemes is considered as taxable income for the individual in a majority of countries. The only exceptions are Hungary, Lithuania, the Slovak Republic, Turkey and Bulgaria, where public pensions are fully tax exempt. These are countries where private pension income is also tax-exempt, at least under certain circumstances or for certain types of plan (see Table 2.3).

Pension income in general benefits from a different tax treatment than income from work in many countries. Tax credits - deductions on the tax due - are provided to pensioners in Australia, Austria, Canada, the Czech Republic, Ireland, the Netherlands, Norway and Slovenia.¹⁰ Tax allowances are income limits under which individuals do not pay taxes. Individuals get special allowances for their pension income in the Czech Republic, Mexico, Spain, Sweden, Colombia and Romania. Finally, special tax deductions apply to pension income in Finland, France, Germany, Japan, Portugal, and the United States.

2.5. Are social contributions levied on private pension contributions and private pension income?

Besides the personal income tax system, contributions to private pension plans and benefits paid from these plans can be subject to social contributions. These social contributions are usually levied on gross salaries and wages to finance among other things, health insurance, unemployment insurance, public pensions and disability pensions.

Table 2.4 describes for each country whether social contributions are levied on private pension contributions and on private pension income.

In general, contributions paid by individuals from their after-tax income to voluntary personal pension plans are also subject to social contributions. This is because these pension contributions are paid from an income on which social contributions have been levied.

In ten countries (Austria, Belgium, Canada, the Czech Republic, Ireland, Italy, Portugal, Slovenia, Turkey and the United Kingdom), employee contributions to private pension

plans are subject to social contributions while employer contributions are not, or benefit from a reduced rate. In all these countries, employer contributions are not considered as taxable income in the hands of employees. They are not included either in the income base to calculate social contributions. A counter-example is Norway, where employer contributions to mandatory occupational pension plans are not considered as taxable income to the employees, but employers still have to pay social contributions on these occupational pension contributions.

Table 2.4. Social contributions and retirement savings

Are social contributions levied on...

Country	Pension contributions	Pension income
Australia	No	Before age 60: Medicare Levy From age 60: No
Austria	Employee contributions: Yes Employer contributions: No	Pensioners do not pay most social security contributions but do pay for sickness insurance
Belgium	Employee contributions: Yes Employer contributions: Reduced rate IPT: No POZ: Yes VAPZ contributions are considered as social contributions	No for pension savings accounts and life insurance contracts Pensioners with a pension above a minimum threshold pay a social security contribution for health and disability insurance. "Solidarity" contributions are levied on all pensions exceeding a certain threshold
Canada	Employee contributions: Yes Employer contributions: No	No
Chile	Yes	Pensioners pay 7% of pension income for health coverage, except those eligible for a solidarity pension or poor pensioners
Czech Republic	Employee contributions: No for contributions above CZK 12 000 and up to CZK 24 000 per year Employer contributions: No	No
Denmark	No	No
Estonia	Yes	No
Finland	Yes if pension insurance contributions constitute taxable salary (health insurance, mandatory pension insurance and unemployment insurance)	No contributions on pension income for pension or unemployment insurance. There is a separate health care contribution for pension income taxable as earned income
France	Yes	No
Germany	Occupational plans: No up to 4% of the social security contribution ceiling Personal plans: Yes	Pensioners have to pay health and long-term care insurance from their occupational pension payments. Payments made in retirement from Riester, Basisrente and personal pension insurance are not subject to social insurance contributions if the retiree is eligible to pensioners' health insurance
Greece	No	No
Hungary	Yes	No
Iceland	No	No
Ireland	Employee contributions: Yes Employer contributions: No	Pension benefits are subject to the Universal Social Charge
Israel	No	Yes
Italy	Employee contributions: Yes Employer contributions: Reduced rate	No
Japan	No	Contributions to health insurance and long-term care insurance are levied on pension income
Korea	No	No, except for self-employed workers for whom social insurance premiums are levied on the basis of their comprehensive income
Latvia	No	No

Country	Pension contributions	Pension income
Lithuania	Yes	No
Luxembourg	Yes	Yes
Mexico	Yes	No
Netherlands	EET-system: No TEE-system: Yes	Pensioners pay for the general insurance for certain health costs and survivors' pensions
New Zealand	No	No
Norway	Employers pay social security contributions on their occupational pension contributions	Pension income is subject to social security contributions at a reduced rate
Poland	Employer contributions into PPE are not included into income subject to social contributions	Pension income is not subject to contributions for pensions, unemployment insurance etc. However, there is a tax-deductible health insurance contribution.
Portugal	Employee contributions: Yes Employer contributions: No	No
Slovak Republic	Yes Employer contributions to pillar 3 plans are only subject to health insurance contributions	No
Slovenia	Employee contributions: Yes Employer contributions: No within certain limits	No
Spain	Employee contributions: No Employer contributions: Yes	No
Sweden	A reduced social security contribution is applied on contributions for occupational pensions paid by the employer	No
Switzerland	Yes	No
Turkey	Employee contributions: Yes Employer contributions: No up to 30% of the minimum wage	No
United Kingdom	Employee contributions: Yes Employer contributions: No	No
United States	Yes	No
Selected non-OECD countries		
Bulgaria	No	No
Colombia	Yes	Private pension income is subject to health care contributions at a reduced rate
Croatia	Yes	No
Cyprus	Yes	No
Malta	Yes	No
Romania	Voluntary contributions: No Mandatory contributions: Yes	No

Private pension income is usually not subject to social contributions. Yet part of the social contributions usually levied on wages and salaries can also be levied on pension income. For example, in Australia, Austria, Belgium, Chile, Finland, Germany, Japan, the Netherlands, Poland and Colombia only health-insurance related social contributions are levied on pension income.¹¹ Pension income is not subject to any social contributions in 27 of the countries covered by this analysis (Canada, the Czech Republic, Denmark, Estonia, France, Greece, Hungary, Iceland, Italy, Latvia, Lithuania, Mexico, New Zealand, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom, the United States, Bulgaria, Croatia, Cyprus, Malta and Romania).

2.6. Non-tax financial incentives

Financial incentives to encourage people to participate in, or to make contributions to, private pension plans can take a different form than preferential tax treatment. The tax treatment of private pension plans, as described in Sections 2.1 to 2.4 (tax exemptions, tax deductions and tax credits), may constitute in itself an incentive to contribute to such plans if it is more fiscally favourable to contribute to a private pension plan rather than to a traditional savings vehicle.¹²

Other forms of financial incentives include matching contributions from the government or from the employer and government fixed nominal subsidies. These incentives are provided to eligible individuals who actually participate or make voluntary contributions to the private pension system. Both matching contributions and subsidies are paid into the pension account, thus increasing the assets accumulated to finance retirement. They are never taxable to the individual.

Table 2.5. Non-tax financial incentives to promote retirement savings in OECD and selected non-OECD countries

Financial incentives	OECD countries	Selected non-OECD countries
Employer matching contributions	Iceland, Italy, New Zealand, United States	
Government matching contributions (match rate)	Australia (50%), Austria (4.25%), Chile (50% or 15%) ¹ , Czech Republic (scale), Hungary (20%), Mexico (325%) ² , New Zealand (50%), Turkey (25%), United States (50% to 100%) ³	Colombia (20%), Croatia (15%)
Government fixed nominal subsidies	Chile, Germany, Lithuania, Mexico, Turkey	

1. Chile has two different matching programmes, one for young low earners (50% match rate) and one for voluntary contributors (15% match rate).

2. The matching programme for Mexico only applies to public sector workers.

3. The matching programme for the United States refers to the Thrift Savings Plan for federal employees. The first 3% of employee contribution is matched dollar-for-dollar, while the next 2% is matched at 50 cents on the dollar.

Matching contributions are the most common type of non-tax financial incentive used by countries to promote saving and participating in private pensions. Government matching contributions are found in Australia, Austria, Chile, the Czech Republic, Hungary, Mexico, New Zealand, Turkey and the United States (Table 2.5). Employer matching contributions can be found in Iceland, Italy, New Zealand, and the United States. The matching contribution is conditional on the individual contributing and corresponds to a certain proportion of the individual's own contribution, up to a maximum amount. The generosity of the match rate varies greatly across countries, from 4.25% in Austria to 325% in Mexico (solidarity savings programme for civil servants). A match rate of 50% can be found in Australia, Chile and New Zealand.

Only five countries use government subsidies to promote private pensions. Government subsidies are fixed nominal amounts and are therefore more valuable to low-income earners, as the fixed amount represents a higher share of their income. In Chile, government subsidies are provided to encourage participation in the private pension system. Although the system is mandatory for employees, large informality prevents universal coverage of the system. Subsidies target specifically women with a deposit for each live birth. In Germany, government subsidies are paid into Riester pension plans

(voluntary private pension plans). The maximum subsidy is available to individuals who are actively compulsorily insured in a pension system and is paid each year in the account if the individual contributes at least 4% of his/her previous year's annual income. Additional subsidies are available to young individuals and to parents receiving child allowances. In Lithuania, the government contributes 2% of the average gross salary of the year before the last in second pillar pension accounts. In Mexico, the government pays a so-called social quota in mandatory pension accounts. In Turkey, the government pays a one-time contribution of TRY 1 000 for employees who do not opt out within the first two months following their automatic enrolment into a personal pension plan.

Turkey also incentivises individuals to choose an annuity at retirement in their automatic enrolment system. The government pays a subsidy equal to 5% of participants' savings at retirement for those who choose a minimum 10-year annuity.

2.7. Conclusion

This chapter has shown that half of the OECD countries apply a variant of the “Exempt-Exempt-Taxed” (“EET”) tax regime to funded private pension plans, where both contributions and returns on investment are exempt from taxation and benefits are treated as taxable income upon withdrawal. However, a full range of possible tax regimes applies in other countries, including the “EEE” tax regime.

Straightforward and simple tax rules applying to the private pension system as a whole may increase people's confidence and help increasing participation in and contributions to private pension systems. A majority of countries impose different tax treatments to different types of plan or contribution at the national level. This may create confusion for people who may not have the ability to understand the differences and choose the best option for themselves.

The tax treatment of contributions to private pension plans may change according to the source of the contribution (the employee or the employer), their mandatory or voluntary nature, and the type of plan in which they are paid (personal or occupational plans). In addition, limits to the amount of contributions attracting tax relief may also differ for different types of contribution within a country. In most countries, people not paying income tax do not get any relief on their contributions into private pension plans.

A different tax treatment between mandatory and voluntary contributions may be justified. Incentives to save for retirement through the income tax system may be necessary in voluntary pension arrangements as a way to encourage people to save in complementary funded private pension plans. In mandatory pension arrangements, the reasons for providing incentives may be less clear. Incentives may be useful in order to make people accept the policy of compelling them to save for retirement. Moreover, in countries with high informality in the labour market, incentives may also be needed to increase contribution densities.

Most countries exempt from taxation returns on investment in private pension plans. When returns are taxed, they are usually taxed every year during the accumulation phase. However, some countries tax returns upon withdrawal only. Tax rates may vary according to the duration of the investments, the type of asset classes, or the income of the plan member. Most countries do not tax the funds accumulated and impose no lifetime limit on the total amount that plan members can accumulate in a private pension plan.

The tax treatment of pension income is identical across different types of post-retirement product (life annuity, programmed withdrawal or lump sum) in about half of the OECD countries. Only three OECD countries incentivise people to annuitize their pension income through a more favourable tax treatment for annuities as compared to programmed withdrawals, or through a government subsidy. Conversely, lump sums are tax free up to a certain amount or only partially taxed in about half of the OECD countries in order to reach a more neutral tax treatment across the different post-retirement products. A minority of countries discourage early withdrawals through the tax system.

Besides the personal income tax system, contributions to private pension plans and private pension benefits can be subject to social contributions. In general, contributions paid by individuals from their after-tax income to voluntary personal pension plans are also subject to social contributions. Private pension income is usually not subject to social contributions or only a part of the social contributions usually levied on wages and salaries is levied on pension income.

The complexity of the tax treatment of retirement savings may prevent individuals to save for retirement. Consequently, some countries have introduced more direct financial incentives to encourage participation in, and contributions to, the private pension system, especially for low-income earners. Non-tax incentives considered herein include matching contributions from the government or from the employer and government fixed nominal subsidies. These payments are provided to eligible individuals who actually participate in or make voluntary contributions to the private pension system. Such incentives can be found in 13 OECD countries.

Notes

¹ Note by Turkey: The information in this document with reference to “Cyprus” relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people in the Island. Turkey recognizes the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of United Nations, Turkey shall preserve its position concerning the “Cyprus” issue.

² Note by all the European Union Member States of the OECD and the European Union: The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

³ In the case of France, tax is treated as encompassing the personal income tax system, the General Social Contribution (CSG) and the Social Debt Reimbursement Contribution (CRDS). There is a debate on how to classify the CSG. The French Law considers it a tax because it does not entitle workers to any right or benefit (as opposed to social security contributions). The Court of Justice of the European Union considers it a social contribution because the money is only used to finance the social security system and is levied on wages (although not only). Following the French interpretation, both CSG and CRDS are treated as taxes in this analysis, rather than as social contributions.

⁴ In the case of Australia, most pension benefits paid to people over 60, whether lump sums or income streams, are tax free. However, benefits that come from an account that has not been

subject to tax on contributions are subject to tax when they are paid to the individual. In addition, investment income is usually tax exempt after the individual enters the drawdown phase.

⁵ In the case of Mexico, pension income above 15 times the annual minimum wage is taxed.

⁶ In the case of Austria, an extra insurance tax (2.5% or 4% depending on the type of plan) is levied on individual and employer contributions to certain plans. In the case of Belgium, the employer must pay an annual 4.4% tax on the total contributions paid (employer plus employee) under group life insurance contracts. This tax is not due in the case of a pension scheme with a solidarity component (so-called “social” pension scheme).

⁷ See the country profile of Australia in the Annex for detailed explanations on how the 30% rate is triggered.

⁸ The Australian government provides a Low-Income Super tax Offset (LISTO) of up to AUD 500 annually for eligible individuals on adjusted taxable income of up to AUD 37 000. The amount payable is calculated by applying a 15% match rate to concessional pension contributions made by, or for individuals. It is effectively a refund of the tax paid on concessional contributions.

⁹ In Iceland, Sweden and Croatia, only annuities are allowed. In Belgium, only lump sums are allowed, except for occupational pension plans that can offer life annuities, although this option is rarely taken. In Cyprus, pension benefits paid by provident funds only take the form of lump sums. In Romania, there is no pay-out product legislation yet, so most withdrawals are lump sums. However, the secondary legislation has been amended in order to allow members to receive their accumulated account as monthly instalments up to 5 years, starting April 2018.

¹⁰ In addition, in Canada, seniors and pensioners are permitted to allocate up to one-half of their eligible pension income to their spouse or common-law partner for tax purposes.

¹¹ In Chile, since 2011, pensioners eligible for a solidarity pension (who must belong to the 60% poorest population, among other requirements) are exempt to pay contributions for health insurance. Since 2016, pensioners that belong to the 80% poorest population and are not eligible for a solidarity pension, are also exempted to contribute for healthcare.

¹² The purpose of this chapter is not to assess the tax advantage received by individuals in different countries when contributing to a private pension plan rather than to a traditional savings vehicle. This is the main objective of Chapter 3.

Chapter 3. Does the design of financial incentives provide a tax advantage when people save for retirement?

This chapter assesses whether the design of financial incentives in different countries provides a tax advantage when people save for retirement. It calculates the tax advantage that individuals saving into retirement savings plans may enjoy over their lifetime. This overall tax advantage is the amount that an individual would save in taxes paid by contributing to a retirement savings plan instead of putting the same amount into an alternative benchmark savings vehicle. It includes the effect of both tax and non-tax financial incentives, and it is calculated for different types of plans across 42 OECD and selected non-OECD countries.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The design of financial incentives to promote savings for retirement varies greatly across countries. As shown in Chapter 2, half of the OECD countries apply a variant of the “Exempt-Exempt-Taxed” (“EET”) tax regime that exempts contributions and returns on investment from taxation while taxing pension benefits and withdrawals as income. Yet a wide range of other tax regimes can be found as well, from the “EEE” tax regime where contributions, returns on investment and pension income are all tax exempt, to regimes where two of three flows are taxed. In addition, among OECD countries, nine offer government matching contributions and five use government subsidies to promote private pensions.

This chapter assesses whether the design of financial incentives in different OECD and non-OECD countries provides a tax advantage when people save for retirement. It calculates the tax advantage that individuals contributing to retirement savings plans may enjoy over their lifetime. It calculates this overall tax advantage for different types of retirement savings plan across 42 OECD and selected non-OECD countries. The approach used consists in comparing the tax treatment of a retirement savings plan to that of a benchmark savings vehicle, i.e. comparing how contributions, returns on investment and withdrawals are taxed in each savings vehicle. The tax advantage calculation includes the effect of government non-tax incentives, such as fixed nominal subsidies and matching contributions, which are treated as refundable tax credits paid into the pension accounts of entitled individuals. The overall tax advantage therefore represents the amount that an individual would save in taxes paid during their working and retirement years by contributing the same amount (before tax) to a retirement savings plan instead of to a benchmark savings vehicle.

In the 42 countries analysed, the design of financial incentives does indeed provide a tax advantage when people save into retirement plans instead of into other traditional savings vehicles. The size of the overall tax advantage varies, however, and depends on the tax regime applied to retirement plans and savings vehicles, as well as on the characteristics of the personal income tax system (i.e. the tax brackets and the tax rates), the income level, the amount saved, the length of the contribution period, the type of post-retirement product, the benchmark savings vehicle chosen as a comparator and other financial and economic parameters.

Before providing country-specific results in Section 3.2, Section 3.1 first explores the mechanisms through which the current main approach to designing financial incentives (the “EET” tax regime) may provide a tax advantage to individuals contributing to retirement savings plans. This section introduces the approach used to calculate the overall tax advantage and conducts a sensitivity analysis to help explain how different factors may influence the results. Section 3.2 then calculates the amount of tax saved by individuals in 42 OECD and non-OECD countries when contributing to a retirement plan instead of to a benchmark savings vehicle. The overall tax advantage is calculated for all types of private pension plan existing in the analysed countries, as long as the financial incentive is designed differently. Section 3.3 concludes. Finally, Annex 3.A provides the full description of the framework and assumptions.

3.1. How financial incentives provide a tax advantage to individuals

This section first introduces the approach used to calculate the overall tax advantage when people save for retirement. It then calculates the overall tax advantage for the “EET” tax regime and looks at how it varies for different levels of income, lengths of the contribution period, contribution rates, tax-deductibility ceilings, post-retirement products

and financial and economic parameters (inflation, productivity growth, rate of return and discount rate). It ends with a summary of the main findings.

How to calculate the overall tax advantage

This sub-section introduces the approach used to calculate the overall tax advantage that results from the tax regime of retirement savings. The calculation consists in comparing the tax treatment of a pension plan to that of a benchmark savings vehicle, i.e. comparing how contributions, returns on investment and withdrawals are taxed in each case.¹

Traditional forms of savings are taxed the same way as other income and earnings. Saving, including for retirement, involves three income flows: contributions, returns on investment and withdrawals. In general, contributions are paid from after-tax earnings; the investment income generated is taxed; and withdrawals are exempt from taxation. This is generally referred to as the “Taxed-Taxed-Exempt” or “TTE” tax regime.

Table 3.1 illustrates how much tax would be paid under two tax regimes that commonly apply to traditional savings vehicles (“TTE”) and to retirement savings plans (“EET”). The calculations assume that an initial contribution of EUR 1 000 is invested for 10 years and earns a constant 5% return. The individual is subject to a 25% marginal tax rate that remains constant over time. The discount rate is set equal to the rate of return to calculate the present value of tax paid. Under the “TTE” tax regime, the individual pays EUR 250 in tax when the contribution is made, so that, after tax, only EUR 750 are actually invested. At the end of each year, the individual also pays taxes on investment income, amounting in total to EUR 84.7 in present value. Upon withdrawal, no tax is due and the after-tax withdrawal is equal to EUR 1 083.8.

Under the “EET” tax regime, tax is only due upon withdrawal. The present value of tax paid amounts to EUR 250 and the after-tax withdrawal to EUR 1 221.7. The individual therefore pays EUR 84.7 less in taxes in present value terms when contributing to an “EET” plan rather than to a “TTE” plan. The difference in after-tax withdrawal is also equal to EUR 84.7 in present value. Provided the discount rate is equal to the rate of return, the benefit that accrues to the individual can be expressed as either a tax advantage or as a retirement income advantage.

Table 3.1. Overall tax advantage: illustration (in EUR)

	EET		TTE		Difference
	Nominal	PV	Nominal	PV	PV
Pre-tax contribution	1 000.0		1 000.0		
Tax paid on contribution	0.0	0.0	250.0	250.0	
Amount invested	1 000.0		750.0		
Tax paid on returns during investment period	0.0	0.0	111.3	84.7	
Account balance after 10 years	1 628.9		1 083.8		
Tax paid on withdrawal	407.2	250.0	0.0	0.0	
After-tax withdrawal	1 221.7		1 083.8		84.7
Total tax paid		250.0		334.7	84.7
Overall tax advantage					8.5%

Note: “E” stands for exempt, “T” for taxed and “PV” for present value. The calculations assume that an initial contribution of EUR 1 000 is invested for 10 years and earns a constant 5% return. The individual is subject to a 25% marginal tax rate, constant over time. The discount rate is equal to the rate of return.

The analysis calculates the “overall tax advantage”, by extending the simulation to the entire lifetime of the individual and considering the particularities of different tax regimes.² The overall tax advantage should not be confused with the incentive to save (Box 3.1). The overall tax advantage is defined as the difference in the present value of total tax paid on contributions, returns on investment and withdrawals when an individual saves in a benchmark savings vehicle or in an incentivised retirement plan, given a constant contribution rate during the entire career. It is expressed as a percentage of the present value of pre-tax contributions. The overall tax advantage represents the amount saved in taxes paid by an individual over their working and retirement years when contributing the same amount (before tax) to an incentivised pension plan rather than to a benchmark savings vehicle. The impact of both tax and non-tax incentives is reflected in the overall tax advantage by evaluating non-tax incentives as refundable tax credits paid into the pension account.

Box 3.1. Difference between the overall tax advantage and the incentive to save

A positive overall tax advantage means that the individual pays less taxes when contributing to an incentivised retirement plan rather than to a benchmark savings vehicle. It does not mean that the individual has an incentive to save. The overall tax advantage and the incentive to save are two different measures.

The incentive to save is measured by the after-tax rate of return. A tax system is neutral when the way present and future consumption is taxed makes the individual indifferent between consuming and saving. This is achieved when the after-tax rate of return is equal to the before-tax rate of return.

Taxing returns creates a disincentive to save because the present value of the income is greater if it is used for consumption today than if it is used for consumption tomorrow (Mirrlees et al., 2011^[1]). A “TTE” tax regime therefore incentivises consumption rather than savings. In the example from Table 3.1, the after-tax rate of return with the “TTE” tax regime is equal to 3.75%, which is lower than the before-tax rate of return of 5%.

By contrast, an “EET” tax regime is neutral between saving and consuming (the after-tax rate of return is equal to 5%), provided that the individual faces a constant personal income tax rate over time. When the tax rate on withdrawals is lower than the tax rate at which contributions were deducted, the after-tax rate of return is greater than the before-tax rate of return, creating an incentive to save. When the opposite is true, for example due to a loss of entitlement to a means-tested public pension, the after-tax rate of return is lower than the before-tax rate of return, leading to an incentive to consume.

Upfront taxation of retirement savings, “TEE”, also achieves tax neutrality between saving and consuming, as long as returns are not above the “normal return to saving”. The normal return to saving is the return that just compensates for delaying consumption. It is also often called the risk-free return (Mirrlees et al., 2011^[1]).

Therefore, the tax treatment of retirement savings may lead to a positive overall tax advantage, independently of whether the individual has an incentive to save, is indifferent between saving and consuming, or has a disincentive to save (i.e., the after-tax rate of return is larger, equal or lower than the before-tax rate of return).

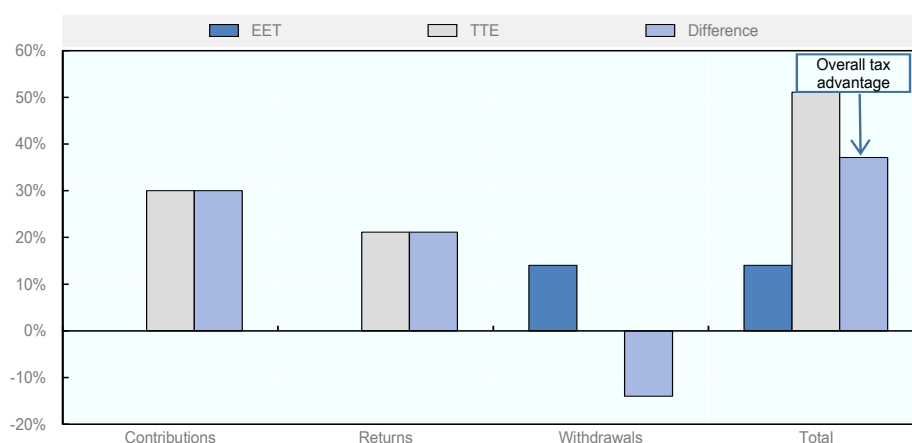
During working life, the analysis assumes that wage income is the only source of income. Marginal tax rates are derived by determining the income tax bracket in which the individual's wage falls every year. Wages are assumed to grow in line with inflation and productivity (both assumed to be constant over time), as do the income limits for the income tax brackets.³ When contributions or returns on investment are subject to personal income tax, the tax rate that implicitly applies to them is the marginal tax rate, i.e. the tax rate that an individual would pay on the latest unit of income earned.

During retirement, the analysis assumes that the only sources of income are pensions, both mandatory public pensions and the pension benefits from the private pension plan. The comparison made with respect to the benchmark savings vehicle substitutes the income from the private pension plan with the income from this alternative savings vehicle. The level of mandatory public pension that the individual may be entitled to is calculated by applying the OECD average gross replacement rate derived from the OECD pension models to the last wage (OECD, 2017_[2]). The analysis assumes that public pensions grow in line with inflation and are fully subject to personal income tax. The tax due during retirement is therefore calculated by applying the corresponding rates to each income tax bracket up to the individual's total taxable pension income (i.e. public plus private pensions in the case of the private pension plan, versus public pensions only in the case of the benchmark savings vehicle).

The rest of the section calculates the overall tax advantage for a hypothetical defined contribution funded pension plan to which the "EET" tax regime applies. The benchmark savings vehicle is a traditional savings account to which the "TTE" tax regime applies. As a baseline, the calculations assume that the average earner enters the labour market at age 20 in 2018 and contributes 5% of wages yearly until age 65. The total amount of assets accumulated at retirement is converted into an annuity certain with fixed nominal payments.^{4 5} Inflation is set at 2% annually, productivity growth at 1.25%, the real rate of return on investment at 3% and the real discount rate at 3%.⁶

Figure 3.1. Overall tax advantage for an "EET" tax regime

Present value of taxes paid under the "EET" and "TTE" tax regimes, as a percentage of the present value of contributions



Note: "E" stands for exempt and "T" for taxed.

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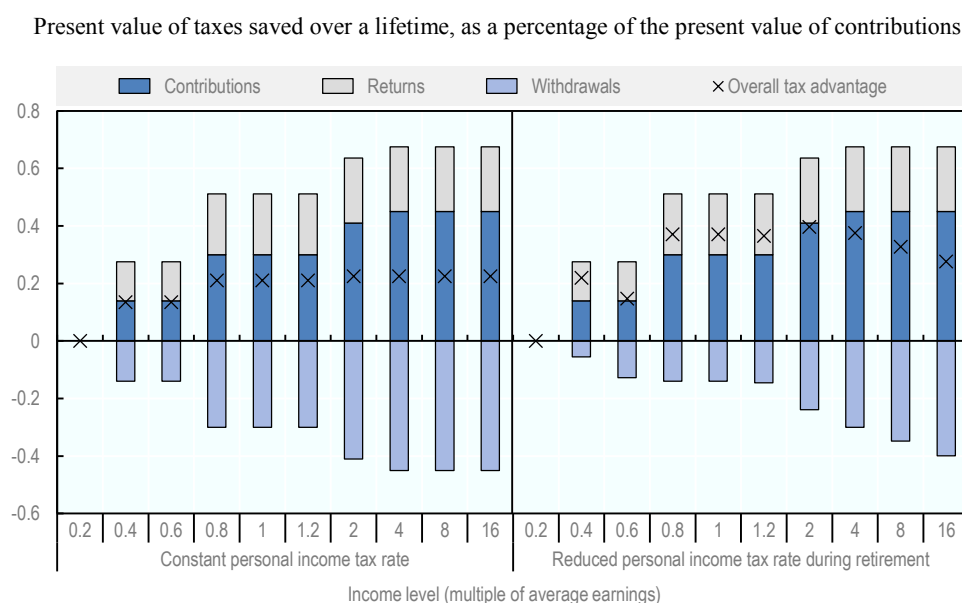
Comparing the taxes paid under the “EET” and “TTE” tax regimes for each income flow produces a positive overall tax advantage for the average earner. Figure 3.1 shows that, under the “EET” tax regime, the individual enjoys a preferential tax treatment on contributions and returns on investment as compared to the “TTE” tax regime. This preferential tax treatment outweighs the taxation of pension benefits and withdrawals, thereby providing an overall tax advantage to the individual when contributing to an “EET” retirement plan rather than to a “TTE” traditional savings account.

Impact of the level of income

The first sensitivity analysis looks at the impact of changing the way in which the tax rate during the retirement period is determined. Instead of using the total taxable pension income (public and private pensions), one could assume that the individual’s income remains in the same tax bracket at retirement. Then the analysis turns to the overall tax advantage for individuals on different income levels under both assumptions.

The overall tax advantage provided by the “EET” tax regime, as compared to a “TTE” benchmark, is essentially equivalent to exempting returns on investment from tax when tax rates are the same at the time of contribution and withdrawal. Under that assumption, the reduction in taxes paid on contributions is exactly equal, in present value, to the increase in taxes paid on withdrawals, regardless of the income of the individual saver. As is illustrated in the left panel of Figure 3.2, the tax advantage on contributions (blue bars) is equal to the tax advantage on withdrawals (light-blue bars), with opposite signs. The overall tax advantage (black crosses) is therefore equal to the tax advantage on returns (grey bars), for all income levels. Also, the after-tax rate of return is equal to the before-tax rate of return and the tax regime provides neutrality between saving and consuming to all individuals (see Box 3.1).

Figure 3.2. Overall tax advantage for an “EET” tax regime, by income level and components



Note: On the left panel, each individual remains in the same tax bracket over working and retirement years. On the right panel, the tax rate during retirement is defined according to the level of taxable pension income (including public pensions).

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The link between the overall tax advantage provided by an “EET” tax regime and the income level of the individual depends on the structure of the personal income tax system. In countries where all individuals have their entire income taxed at the same rate, the overall tax advantage provided by the “EET” tax regime is the same across the income scale. When personal income tax rates increase with taxable income, the overall tax advantage increases with income through higher marginal tax rates. Indeed, individuals with higher marginal tax rates benefit more relative to a taxable alternative on every unit of investment income to which a zero rate of tax applies. However, the amount of investment income that would have been generated by an after-tax contribution into a benchmark “TTE” savings account is lower for individuals with higher marginal tax rates. The result is that the overall tax advantage increases with marginal tax rates, but the rate of increase slows as the marginal tax rate increases (Brady, 2012^[3]). This is illustrated in the left panel of Figure 3.2. It is however noteworthy that individuals not paying taxes do not get any tax advantage.

The relative level of retirement income compared to income from work affects the link between the overall tax advantage provided by the “EET” tax regime, and the level of income. Retirement income is usually lower than income from work, hence retirement income is likely to be taxed at a lower average rate than income from work. Therefore, when considering the total taxable pension income to determine the tax rate during the retirement period, the tax paid on withdrawals may not fully offset the initial tax relief on contributions and the overall tax advantage is larger than when the tax rate remains constant over the lifetime (see right panel of Figure 3.2). This also means that the tax regime incentivises saving, in particular for middle to upper-middle income earners (the after-tax rate of return is greater than the before-tax rate of return, see Box 3.1). The right panel of Figure 3.2 shows that the overall tax advantage increases significantly for individuals earning between 80% and 2 times the average earnings when they face lower tax rates during retirement than while working. For high-income earners, there is a convergence towards tax neutrality because the higher the income level, the less likely is the individual to experience a fall in tax rate at retirement.

Impact of the length of the contribution period

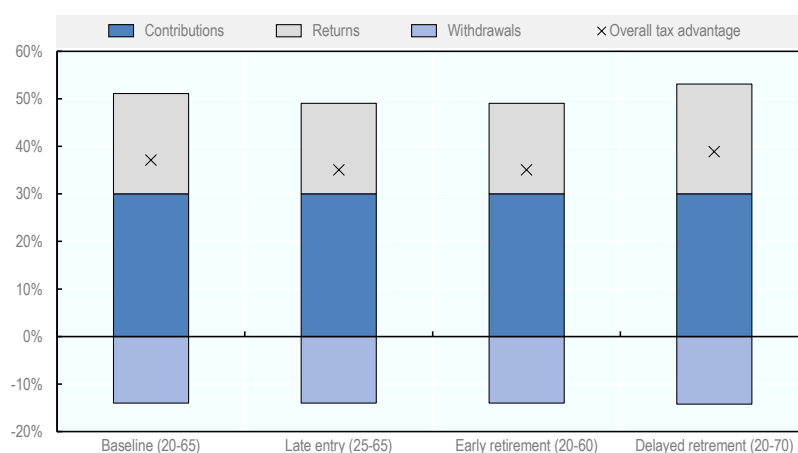
The overall tax advantage of contributing to an “EET” retirement plan rather than to a “TTE” traditional savings account increases with the length of the contribution period. Figure 3.3 shows the overall tax advantage for three different lengths of the contribution period: 45 years (baseline, from age 20 to 65), 40 years (late entry at age 25 or early retirement at age 60) and 50 years (delayed retirement to age 70). The longer the contribution period, the larger the overall tax advantage provided by the “EET” tax regime. For example, for an average earner, the present value of taxes saved represents 35% of the present value of contributions after 40 years of contributions, 37% after 45 years and 39% after 50 years. Early retirement and late entry for the same length of the contribution period provide similar results.

The main driver of this result is the compound interest. When returns on investment in private pension plans are tax exempt, the tax advantage on returns on investment is positive. The longer the contribution period is, the longer the investment income can accumulate and the larger the tax advantage on returns is. The tax advantages on contributions and on withdrawals also vary with the length of the contribution period, but the variations are not significant when expressed as a percentage of the present value of contributions. Because of the compound interest, returns on investment increase in a larger proportion than contributions and withdrawals when the contribution period is

longer. Therefore, the variation in the tax advantage on returns is the main driver of the variation in the overall tax advantage when the length of the contribution period changes.

Figure 3.3. Overall tax advantage for an “EET” tax regime, according to the length of the contribution period, average earner

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



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Impact of the contribution rate

The overall tax advantage varies with changes in the contribution rate. When there are no limits to the amount of contributions attracting tax relief, increasing the contribution rate from 5% to 10% reduces the overall tax advantage provided by the “EET” tax regime. A higher contribution rate leads to higher pension payments during retirement. This increases the share of total taxable pension income in the last income tax bracket, and thereby the average tax rate applied to total taxable pension income, and the tax paid on withdrawals. The tax advantage on withdrawals is therefore more negative with a higher contribution rate (see Figure 3.4). By contrast, the tax advantage on contributions and on returns do not vary with the contribution rate as the tax advantage is expressed as a percentage of the present value of contributions.

Figure 3.4. Overall tax advantage for an “EET” tax regime, according to the contribution rate, average earner

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



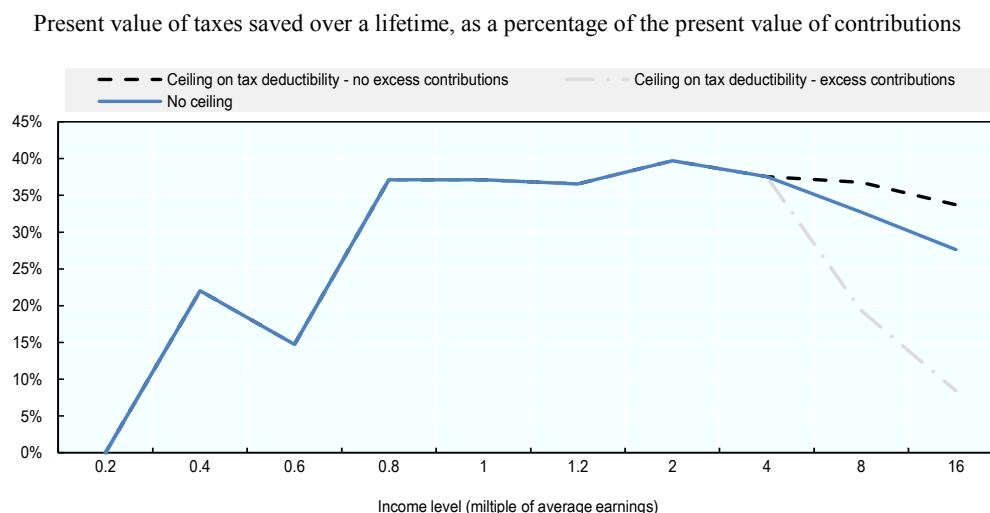
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Impact of ceilings on tax-deductible contributions

The impact of introducing a ceiling on tax-deductible contributions depends on whether individuals make excess contributions. Figure 3.5 compares the overall tax advantage across different income groups, when there is no ceiling on the tax-deductibility of contributions and when a ceiling is introduced, with and without the possibility to make excess contributions. When excess contributions are allowed, introducing a ceiling reduces the amount of taxes saved only for individuals who contribute beyond the ceiling. The ceiling has no impact on the overall tax advantage as long as contributions remain below it. When the analysis assumes that all individuals contribute the same proportion of their earnings (5%), the likelihood of exceeding the ceiling increases with income. In addition, as the ceiling is set as a fixed nominal amount, the part of taxable contributions increases with the income level, thereby reducing the tax advantage on contributions and the overall tax advantage as income increases.

By contrast, when excess contributions are not allowed, or when individuals do not want to contribute above the ceiling, high-income earners actually get a larger overall tax advantage. When individuals refrain from making excess contributions because those contributions do not get tax relief, the introduction of the ceiling modifies the amount contributed into the plan. High-income earners are more likely to reach the ceiling and therefore to reduce their contributions as a proportion of their earnings. This would lead high-income earners to accumulate fewer pension assets, have lower pension benefits, and therefore pay less taxes (as compared to a situation without the ceiling). Lower pension benefits translate into a higher overall tax advantage for high-income earners because the proportion of their total pension income in the last tax bracket will be lower compared to a situation without the ceiling.

Figure 3.5. Overall tax advantage for an “EET” tax regime, with and without a ceiling on tax-deductible contributions, by income level



Note: The ceiling corresponds to 20% of the average earnings in the economy.

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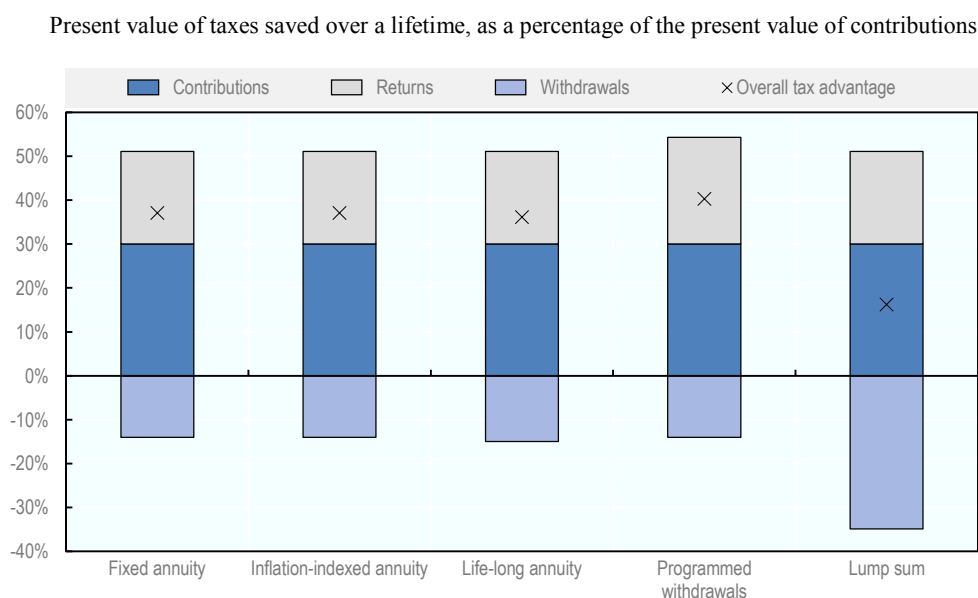
Impact of the type of post-retirement product

This sub-section considers five types of post-retirement product and explores how sensitive the overall tax advantage provided by the “EET” tax regime is to them. The types considered are: annuity certain with fixed nominal payments, annuity certain with inflation-indexed payments, life-long annuity with fixed nominal payments, programmed withdrawals, and single lump-sum payment.⁷ The tax advantage on contributions is not sensitive to the choice of the post-retirement product, but the other two components of the overall tax advantage may be affected by that choice.

Individuals withdrawing their savings all at once as a lump sum receive a lower overall tax advantage than individuals getting regular income during retirement (annuities and programmed withdrawals). As illustrated in Figure 3.6, the tax due on withdrawals under the “EET” tax regime is larger in the case of a lump-sum payment. When the whole amount of assets accumulated at retirement is taken as a lump sum, the individual’s total taxable pension income may move to a higher income tax bracket, implying higher taxes paid than when the assets are spread over retirement to get a regular income. As a consequence, the overall tax advantage is lower with the lump-sum option.

Programmed withdrawals provide a larger overall tax advantage than annuities. With programmed withdrawals, assets remain invested during the post-retirement phase. They keep accumulating tax free in the “EET” retirement plan, while returns continue to be taxed in the “TTE” traditional savings account. Therefore, the overall tax advantage is larger with programmed withdrawals than with annuities.

Figure 3.6. Overall tax advantage for an “EET” tax regime, according to the post-retirement product, average earner



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Differences are smaller between different types of annuity product. The overall tax advantage is exactly the same when comparing an annuity certain with fixed nominal payments to an annuity certain with inflation-indexed payments. Although the payments in each year are different, the sum of the present value of payments over the post-

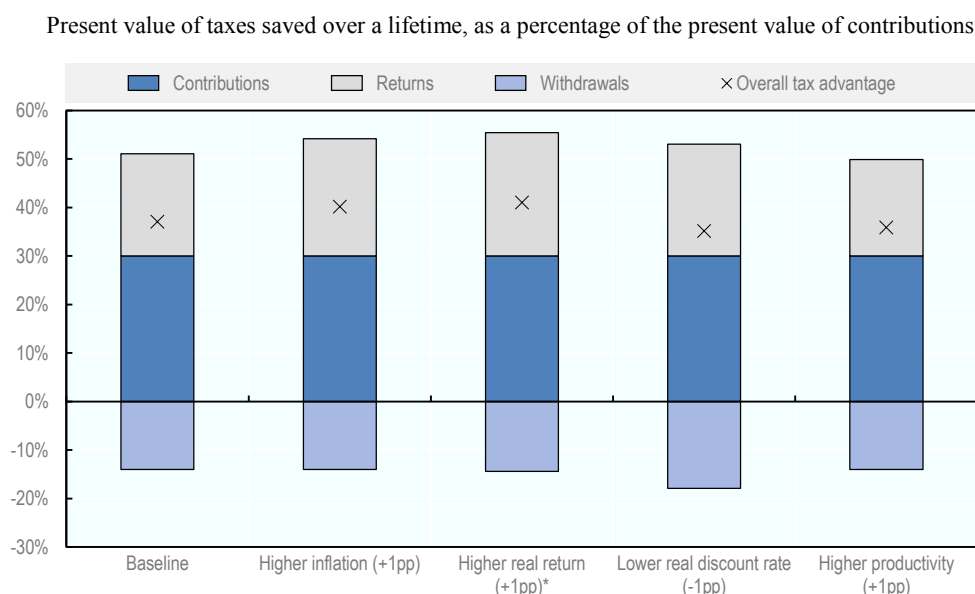
retirement period is identical for both types of annuities. Individuals getting a life-long annuity receive a slightly lower overall tax advantage than individuals getting an annuity certain. The main difference between a life-long annuity and an annuity certain is that the number of payments is not known in advance for the life-long annuity.⁸ In the calculation of the annuity factor, the probability of still being alive at each age is taken into account. The consequence is that the payments are bigger with a life-long annuity than with an annuity certain because the annuity provider considers that there is a positive probability that the individual will die before reaching the average life expectancy of their cohort. When pension benefits are taxed, this translates into a higher tax due and a lower overall tax advantage.

Impact of financial and economic parameters

The overall tax advantage can also change when parameters such as returns, discount rates, inflation and productivity growth change. The baseline has inflation at 2%, productivity growth at 1.25%, and the real rate of return on investment and the real discount rate equal to 3%.

The overall tax advantage increases with inflation and real returns (see Figure 3.7). Higher inflation (from 2% to 3%) or higher real rates of return (from 3% to 4%) lead to higher nominal rates of return. Therefore, the tax advantage on returns provided by the “EET” tax regime, with respect to a “TTE” benchmark, is larger in a higher inflation and return scenario, because the tax paid on returns in the traditional savings account is higher (compound interest). A higher real return increases the level of assets accumulated at retirement, the level of pension benefits and thereby the tax due on them. However, the impact is not significant on the tax advantage on withdrawals.

Figure 3.7. Overall tax advantage for an “EET” tax regime, according to different economic parameters, average earner



Note: In the higher real return scenario, the discount rate is still equal to the rate of return.

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The overall tax advantage provided by the “EET” tax regime declines when the discount rate is lower than the rate of return. A lower discount rate gives a higher weight to future flows. The overall tax advantage therefore declines because future tax payments on withdrawals count more in the present value calculation.

The impact of productivity growth on the overall tax advantage is minor because all the flows grow in similar proportions. An increase in productivity growth translates into higher contributions through higher wages. Productivity growth does not affect the tax advantage on contributions, however, because the indicator is expressed as a percentage of the present value of contributions (the numerator and denominator grow in the same proportion). In addition, an increase in productivity growth implies the same increase in the personal income tax brackets. Therefore, higher returns and higher future pension benefits driven by higher contributions may not translate into higher tax rates applied to these flows.

When income tax brackets only grow in line with inflation, instead of with wage growth, the impact on the overall tax advantage varies with the income level of the individual. When income tax brackets grow at a slower pace than wages, the individual’s wage may move to a higher income tax bracket over time, therefore increasing the marginal tax rate. This implies that the rate at which tax relief is provided may increase during the career, thereby increasing the tax advantages on contributions and on returns. This is only possible for individuals whose entry income does not already fall in the last income tax bracket and when that entry income is close enough to the next tax bracket to move into it before reaching the age of retirement. In the same way, total taxable pension income may move into a higher tax bracket when tax brackets grow only in line with inflation. This would imply higher taxes paid on withdrawals and a more negative tax advantage on withdrawals. Whether the overall tax advantage increases or decreases following the lower indexation of tax brackets will therefore depend on the position of the individual’s entry income in the different tax brackets.

Summary of the main findings

The calculation of the overall tax advantage provided by the “EET” tax regime and the sensitivity analysis allows for a better understanding of the mechanisms through which individuals may benefit from a tax advantage when contributing to incentivised pension plans rather than to traditional savings vehicles. The main findings are:

- Most individuals can expect to pay less in taxes when contributing to an “EET” private pension plan rather than to a “TTE” traditional savings account. The positive overall tax advantage derives from a preferential tax treatment for private pension contributions and returns on investment that is not fully offset by the taxation of benefits. However, individuals not paying taxes do not receive any tax advantage.
- The overall tax advantage increases with income through higher marginal tax rates, but the rate of increase slows as the marginal tax rate increases. When retirement income is taxed at a lower rate than income from work, the tax paid on withdrawals may not compensate fully for the initial tax relief on contributions and the overall tax advantage is larger than when the tax rate remains constant over the lifetime, benefitting in particular middle to upper-middle income earners.
- The overall tax advantage increases with the length of the contribution period because of compound interest.

- A higher contribution rate translates into a lower overall tax advantage because it leads to higher pension benefits that are taxed at a higher rate.
- When excess contributions are allowed, introducing a tax-deductibility ceiling reduces the overall tax advantage for high-income earners, as they are more likely to contribute beyond the ceiling. To avoid a reduced overall tax advantage, high-income earners need to lower their contribution level.
- Lump sums provide a lower overall tax advantage than post-retirement products offering regular payments because they may move the individual's total taxable pension income into a higher income tax bracket.
- Programmed withdrawals provide a larger overall tax advantage than annuities because assets remain invested during the post-retirement phase and continue to be tax exempt in the retirement vehicle, while they are taxed in the traditional savings account.
- A higher nominal rate of return translates into a larger overall tax advantage. This remains true when higher nominal returns are just the result of higher inflation.
- A lower discount rate translates into a lower overall tax advantage because any future differences have a bigger weight in present value calculations.

3.2. Does the design of financial incentives in different countries provide a tax advantage when people save for retirement?

This section sets out the overall tax advantage in 42 OECD and selected non-OECD countries based on tax rules in place in 2018. The overall tax advantage is the amount of tax saved by an individual when contributing to different types of private pension plan instead of to a benchmark savings vehicle. It is calculated for all types of private pension plan that exist in the analysed countries, as long as the financial incentive is designed differently.

The methodology is the same as that described in Section 3.1, but in addition:

- The analysis considers all mandatory and voluntary plans, occupational and personal plans, defined benefit (DB) and defined contribution (DC) plans.
- All the country-specific parameters that apply for each type of plan are taken into account (e.g. tax treatment, tax-deductibility limits, ceiling on the lifetime value of pension assets, non-tax financial incentives).
- The personal income tax system (i.e. the tax brackets and the marginal tax rates) is also country-specific.
- The private pension plans are compared to several benchmark savings vehicles: a traditional savings account, a mutual fund (or collective investment scheme) and any other country-specific popular savings vehicles (e.g. life insurance contracts, special savings accounts). The analysis accounts for the country-specific tax treatment that applies to each benchmark savings vehicle.
- Minimum and mandatory contribution rates fixed by regulation are applied whenever they exist. For voluntary plans, the analysis assumes a 5% contribution rate.
- The age of retirement assumed in the analysis is the official age of retirement in each country.

The section first presents the results when the benchmark savings vehicle is a traditional savings account. It then looks at the impact of changing the benchmark.

Average earners in all analysed countries enjoy a tax advantage when saving for retirement in a private pension plan rather than in a traditional savings account. This is because the preferential tax treatment that contributions and returns on investment usually enjoy in a private pension plan (as compared to a traditional savings account) outweighs the potential taxation of benefits. Table 3.2 provides the overall tax advantage received by an average earner, broken down by components (tax advantage on contributions, tax advantage on returns and tax advantage on withdrawals), for all OECD countries and selected non-OECD countries, and according to different types of private pension plan. It shows that the overall tax advantage is positive for all types of plan except in Denmark and Colombia.⁹ The amount of tax saved varies from 8% of the present value of all contributions in Sweden, to around 50% in Israel, Lithuania, the Netherlands and Mexico. Countries with the largest private pension markets, such as Australia, Canada, Denmark, Switzerland, the United Kingdom and the United States, provide overall tax advantages between 20% and 40% of the present value of contributions, with the United States at the higher end of the range and Australia, Denmark, and the United Kingdom at the lower end.¹⁰

Table 3.2. Overall tax advantage in OECD and selected non-OECD countries by component and type of plan, average earner

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions						
Country	Type of plan / contribution	Tax regime	Overall tax advantage (%)			
			Contributions	Returns	Withdrawals	Total
Australia	Concessional contributions	tEt	18	8	0	25
	Non-concessional contributions	TtE + matching	0	11	0	11
Austria	Pension companies	tEt	35	15	-35	15
	Direct commitments	EET	42	15	-42	15
	Direct insurance	tEt + matching	21	15	-7	29
	Personal pension insurance	TEt	-4	15	-5	6
	State-sponsored retirement provision plans	TEE + matching	-2	15	0	13
Belgium	Pension savings account, ordinary	tEt (tax credit)	22	0	-6	16
	Pension savings account, dual	tEt (tax credit)	17	0	-5	12
	Long-term savings individual life insurance	ttt (tax credit)	20	-4	-6	10
	Occupational plans	Ett	44	-7	-9	28
	"VAPZ" plans (self-employed)	EtT	48	-7	-15	26
	"IPT" plans (self-employed with a company)	Ett	44	-7	-9	28
	"POZ" plans (self-employed without a company)	ttt (tax credit)	18	-4	-7	7
Canada	All	EEt	30	21	-25	25
Chile	Mandatory contributions	EET + matching	6	7	-1	12
	"Type A" voluntary contributions	TEE + matching	14	6	0	21
	"Type B" voluntary contributions	EET	6	6	0	12
Czech Republic	Supplementary plans	tEE + matching	20	14	0	35
Denmark	Quasi-mandatory occupational	EtT	34	7	-17	24
	ATP	EtT	34	7	-23	18
	"Age savings" plans	TtE	0	10	-12	-2

Country	Type of plan / contribution	Tax regime	Overall tax advantage (%)			
			Contributions	Returns	Withdrawals	Total
Estonia	Mandatory contributions	EET	20	17	-11	26
	Voluntary contributions	tEE (tax credit)	20	17	0	37
Finland	Voluntary occupational plans	EET	41	19	-40	20
	Voluntary personal plans set up by employers	tET	21	19	-28	12
	Voluntary personal plans set up by individuals	tET (tax credit)	25	19	-25	19
France	"Article 83" plans	tEt	30	16	-18	28
	"Article 82" plans	Ttt	0	16	-7	9
	"Article 39" plans	EEt	33	16	-18	31
	"PERCO" plans	ttt	15	16	-9	22
	"PERP" plans	tEt	30	16	-18	28
Germany	Occupational plans	EET	36	14	-28	21
	"Riester" plans	EET + subsidy	5	11	-2	14
	Private pension insurance	TEt	0	11	-3	8
Greece	Occupational plans and group contracts	EET	22	12	-22	12
	Other plans	TEE	0	12	0	12
Hungary	Voluntary private pension funds	TEE + matching	16	14	0	30
	Individual retirement accounts	TEE + matching	17	14	0	31
Iceland	Occupational plans	EET	46	9	-26	30
	Personal plans	EET	46	12	-54	4
Ireland	All	EEt	40	21	-19	42
Israel	All	tEE (tax credit)	31	22	0	53
Italy	All	Ett	36	-1	-6	29
Japan	Corporate and individual plans	EEt	30	15	-14	31
Korea	Occupational DC plans	tEt (tax credit)	17	15	-12	20
	Personal plans	tEt (tax credit)	17	15	-14	18
Latvia	Mandatory scheme	EET	20	17	-17	20
	Voluntary scheme	Ett	20	6	0	26
Lithuania	"Pillar 2" plans	TEE + subsidy	42	7	0	49
	"Pillar 3" plans	EEE	15	6	0	21
Luxembourg	Occupational DC plans	tEE	30	2	0	33
	Occupational DB plans	tEE	22	5	0	27
	Personal plans	EEt	42	3	-8	37
Mexico	Mandatory contributions	EEE + matching + subsidy	33	18	0	51
	Short-term voluntary contributions	tTE	2	7	0	9
	Long-term voluntary contributions	EEE	21	18	0	39
Netherlands	All	EET	41	20	-12	48
New Zealand	"KiwiSaver" plans	ttE + matching	12	-2	0	10
	Occupational plans	ttE	-1	1	0	0
Norway	Occupational DC plans	EET	26	19	-16	29
	Occupational plans for the self-employed	EET	26	19	-28	17
	Personal plans	tEt	23	19	-24	18
Poland	"OFE" plans	EET	18	17	-18	17
	"IKZE" plans	EEt	18	17	-10	25
	"PPE" and "IKE" plans	TEE	0	17	0	17
Portugal	Personal plans	tEt	6	22	-2	25
	Occupational plans	EET	29	22	-24	26

Country	Type of plan / contribution	Tax regime	Overall tax advantage (%)			
			Contributions	Returns	Withdrawals	Total
Slovak Republic	"Pillar 2" plans	EEE	19	17	0	36
	"Pillar 3" plans	tTE	5	7	0	12
Slovenia	All	EET	32	4	0	36
Spain	All	EET	30	14	-28	16
Sweden	Quasi-mandatory occupational	EtT	32	5	-29	8
	"Premium Pension"	EET	32	22	-26	29
	Individual pension savings	EtT	32	7	-29	10
Switzerland	Mandatory occupational plans	EET	22	13	-9	26
	Personal plans	EET	22	18	-8	31
Turkey	Auto-enrolment plans	TTE + matching + subsidies	25	5	0	31
	Personal plans	TTE + matching	18	5	0	23
	Employer-sponsored group contracts	TtE	0	6	0	6
United Kingdom	Auto-enrolment plans	EEt	20	13	-10	24
	Plans with relief at source	EEt	20	11	-6	25
United States	401(k) and IRA plans	EET + tax credit	29	22	-9	41
	"Roth" IRA plans	TEE + tax credit	0	22	0	22
Selected non-OECD countries						
Bulgaria	All	EEE	10	8	0	18
Colombia	Global Pension System (DC component)	EEE	0	0	0	0
	"BEPS" programme	EEE + matching	7	0	0	7
Croatia	Mandatory contributions	EEt	28	12	0	40
	Closed pension funds	tEE + matching	20	12	0	31
	Open pension funds	TEE + matching	11	12	0	23
Cyprus	Provident funds	EtE	20	20	0	40
Malta	Occupational plans	tET (tax credit)	19	13	-1	31
	Personal plans	tET (tax credit)	13	13	-1	25
Romania	Mandatory scheme	EEt	10	11	-2	19
	Voluntary scheme	EET	10	11	-4	17

Note: "E" stands for exempt, "T" for fully taxed and "t" for partially taxed.

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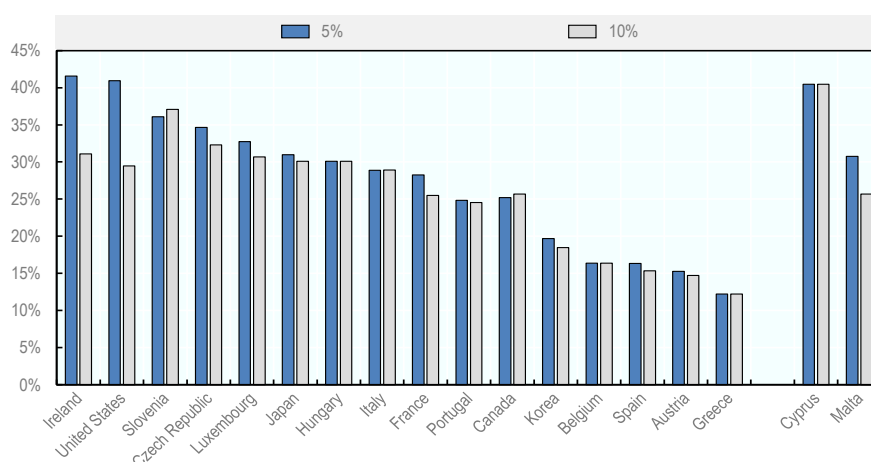
The differences observed across countries are due not only to the characteristics of the tax regimes applied to pension plans and savings vehicles, but also to the characteristics of the personal income tax system in each country (i.e. the tax brackets and the tax rates). In Canada and Greece for example, the overall tax advantage of contributing to a private pension plan is different (25% and 12% of the present value of contributions respectively), even though the same tax regime applies to retirement savings (contributions and returns are tax exempt and withdrawals are taxed, "EET"). However, an average earner in Canada has a marginal tax rate of about 30%, while an average earner in Greece has a 22% marginal tax rate.¹¹ A lower marginal income tax rate results in a lower value of the tax relief.

The overall tax advantage provided to individuals is sensitive to the assumptions used, especially the assumed contribution rate. In voluntary pension systems, people contribute at different rates. Therefore, to compare the overall tax advantage across countries there is a need to assume a single rate of contribution for voluntary components of the pension system.¹² Figure 3.8 shows the impact of increasing the assumed contribution rate from

5% to 10% for voluntary private pension systems. Everything else equal, a higher contribution rate translates into higher assets accumulated at retirement and higher pension benefits. In systems where pension benefits are taxed, these higher benefits may be taxed at a higher rate, because they may push total taxable pension income into a higher tax bracket or because the share of total taxable pension income in the last tax bracket is bigger. This would lead to a reduction in the overall tax advantage. In Ireland, the United States and Malta, the overall tax advantage falls by 10, 11 and 5 percentage point respectively when increasing the contribution rate to 10%. In the other countries with voluntary pension systems, the change in the overall tax advantage provided to the average earner is not significant. The relative value of the tax incentive across countries is therefore significantly affected by the assumed rate of contribution.

Figure 3.8. Overall tax advantage provided by voluntary pension systems according to the assumed contribution rate, average earner

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



Note: Calculations for countries with voluntary private pension systems only, assuming a contribution rate of 5% or 10%.

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In many OECD countries, the overall tax advantage varies according to the type of plan to which individuals contribute. Indeed, many countries apply different tax treatments to different types of plan. For example, in Belgium, individuals can choose from three different vehicles for their voluntary personal pension contributions. However, because the tax treatment of these voluntary contributions varies according to the vehicle, the overall tax advantage changes from 10% of the present value of contributions for long-term savings individual life insurance products to 16% for ordinary pension savings accounts.

When employee and employer contributions to occupational pension plans receive a different tax treatment, the overall tax advantage depends on the relative importance of each type of contribution in the total. For instance, in Croatia, employer contributions are not considered as taxable income for individuals, while employees' contributions are made out of taxed earnings. As the analysis assumes that employer contributions represent half of the total contributions in closed pension funds and 0% in open pension funds, the tax advantage on contributions is larger for closed funds because half of the contributions is tax exempt.

Introducing non-tax financial incentives, such as fixed nominal subsidies or matching contributions, increases the overall tax advantage. For example, in New Zealand, the same tax regime applies to occupational pension plans and to “KiwiSaver” plans (contributions and returns on investment are taxed, but at a lower rate than for a traditional savings account, and withdrawals are tax-free). Adding the government matching contribution for KiwiSaver plans boosts the overall tax advantage from 0% to 10% of the present value of contributions.

In some countries, the overall tax advantage is larger for mandatory pension savings than for voluntary pension savings. This is the case in Australia, where the amount of taxes saved by the average earner represents 25% of the present value of contributions when making mandatory contributions, but only 11% when making voluntary contributions. This trend is also found in Iceland (30% for occupational plans as opposed to 4% for personal plans), Mexico (51% for mandatory contributions as opposed to 39% for long-term voluntary contributions), Norway (29% for occupational DC plans as opposed to 18% for personal plans), the Slovak Republic (36% for pillar 2 plans as opposed to 12% for pillar 3 plans), Croatia (40% for mandatory contributions as opposed to 31% for closed pension funds) and Romania (19% for the mandatory scheme as opposed to 17% for the voluntary scheme).

By contrast, some other countries encourage more voluntary savings. This is the case in Chile (the amount of tax saved represents 21% of the present value of contributions for “type A” voluntary contributions as opposed to 12% for mandatory contributions), Estonia (37% for voluntary contributions as opposed to 26% for mandatory contributions), Latvia (26% for the voluntary scheme as opposed to 20% for the mandatory scheme), and Switzerland (31% for personal plans as opposed to 26% for mandatory occupational plans).

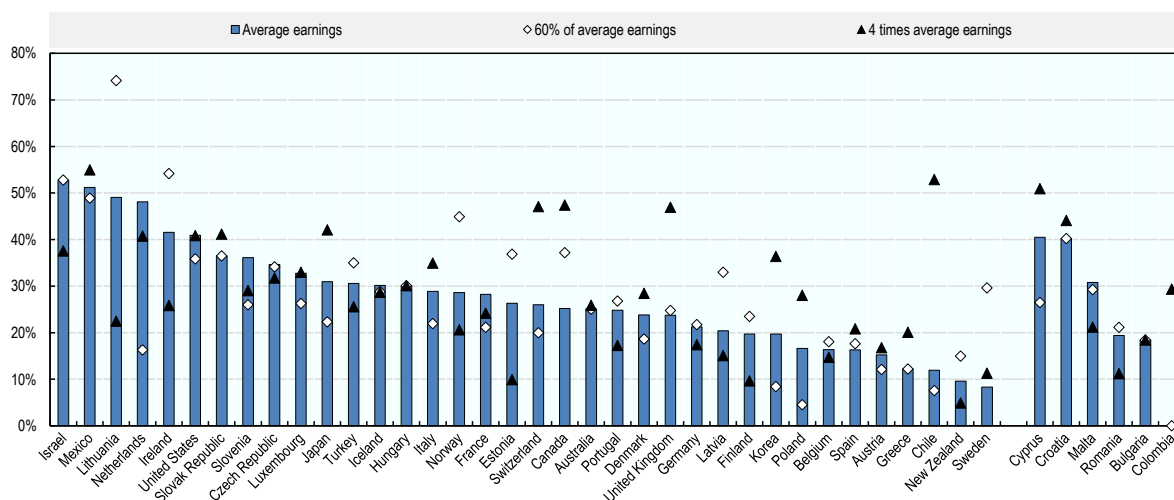
The value of the overall tax advantage varies with the income level of the individual (Figure 3.9). Only countries with fixed personal income tax rates treating all retirement savings equally, independently of the income level, offer the same overall tax advantage across the income scale, as for instance in Bulgaria. In the other countries, the variation of the overall tax advantage with income is the result of the different tax regimes, the plan-specific limits on the amount of contributions attracting tax relief and the characteristics of the personal income tax system in each country. In 18 of the 42 countries analysed, high-income earners (earning four times average earnings) benefit from a higher overall tax advantage than average earners and low-income earners (earning 60% of average earnings). This is the case for example in Canada, Chile, Denmark, Italy, Japan, Poland, Switzerland and the United Kingdom (black triangles are on top).

Low-income earners receive higher financial incentives in 15 of the countries analysed (white diamonds are on top). These include countries offering fixed nominal subsidies (e.g. Lithuania, Turkey) or matching contributions with a low maximum entitlement (e.g. New Zealand). This type of incentive is found to be more valuable to low-income earners as the government payment represents a larger share of their income. This group also includes countries applying the “EET” tax regime to retirement savings but where low-income earners actually receive a total pension income lower than the threshold above which income becomes taxable, basically benefitting from an “EEE” tax regime (e.g. Ireland, Norway).

Finally, seven countries provide the largest tax advantage to average earners, like France, Iceland, the Netherlands and Slovenia (blue bars are higher than the other symbols).

Figure 3.9. Overall tax advantage provided to individuals, by income level

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



Note: Calculations based on the 2018 tax treatment of the main pension plan in each country.

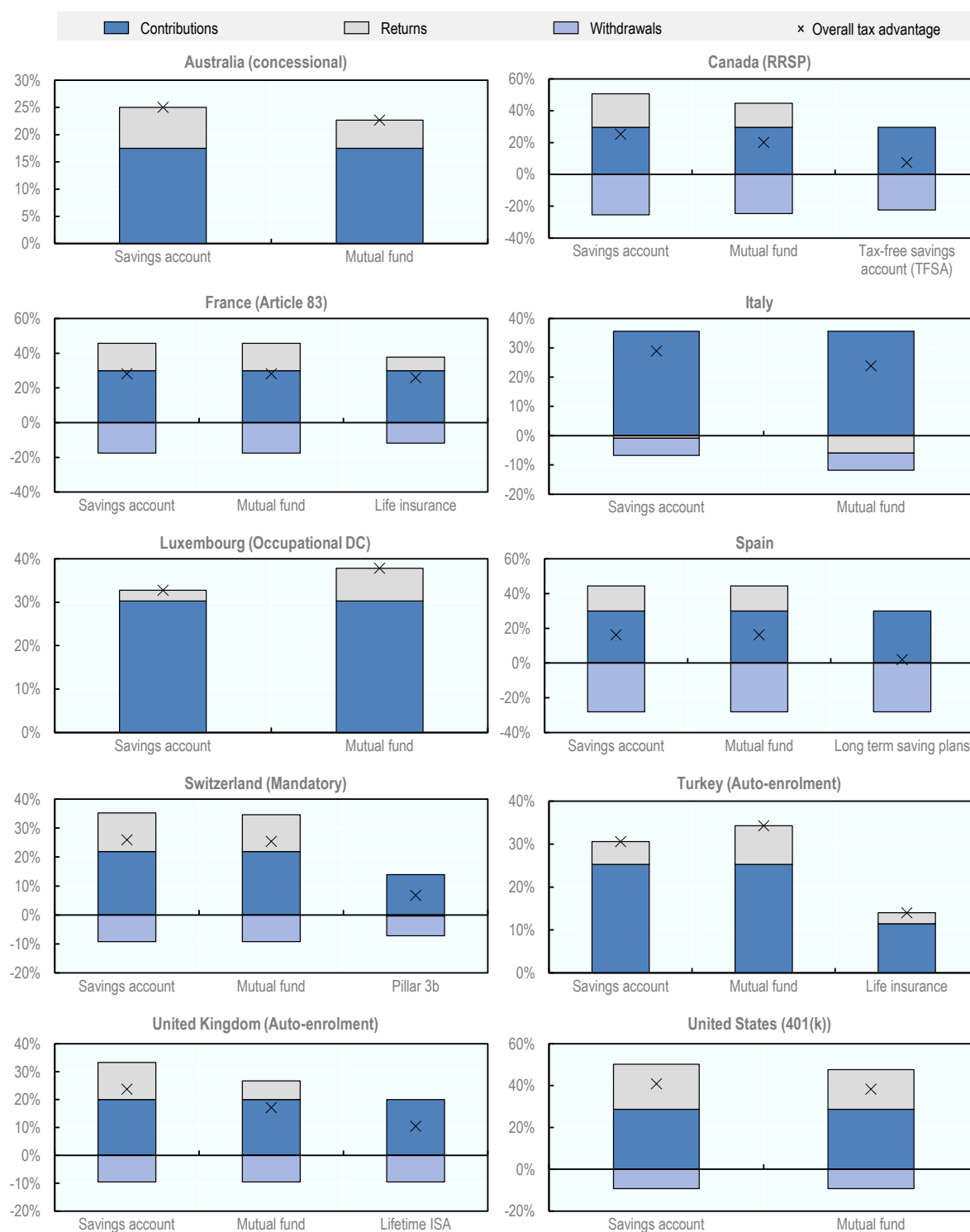
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Figure 3.10 shows that the choice of the benchmark savings vehicle is also important. Out of the 42 countries analysed, in 27 countries, the overall tax advantage that individuals receive when contributing to a private pension plan changes when the benchmark changes. In most cases, the overall tax advantage is lower when the benchmark is a mutual fund rather than a traditional savings account. This stems from the fact that some forms of investment income attract a more favourable tax treatment in a mutual fund than in a traditional savings account, thus lowering the tax advantage on returns derived from the non-taxation or lower taxation of returns in private pension plans. For example, in Canada, returns on investment are taxed at the individual's marginal rate of income tax in traditional savings accounts. For mutual funds, only 50% of capital gains from shares and bonds are included in income for taxation purposes. By contrast, the overall tax advantage is larger in the case of a mutual fund benchmark in Belgium, Korea, Luxembourg, Slovenia, Turkey, Colombia and Malta. Again, the taxation of returns on investment is the cause for the change.

Finally, in some countries, there exists other commonly used savings vehicles with attractive tax treatments that may lower the overall tax advantage of saving for retirement in private pension plans. This is the case in Canada with Tax-Free Savings Accounts (TFsAs), in France with life insurance contracts, in Spain with long-term savings plans, in Switzerland with pillar 3b plans, in Turkey with life insurance contracts and in the United Kingdom with Lifetime Individual Savings Accounts (LISAs). In these countries, the overall tax advantage when saving in a private pension plan is lower when choosing those special savings accounts as comparators. In Canada, Spain and the United Kingdom, a "TEE" tax regime applies to TFsAs, long-term savings plans and LISAs respectively. Contributing to a private pension plan as compared to one of those savings vehicles therefore does not bring any tax advantage on returns on investment. In the case of Switzerland, an "EET" tax regime applies to pillar 3b plans, just as for private pension plans, the tax relief on contributions is however more limited for pillar 3b plans. Regarding life insurance contracts, a "Ttt" tax regime applies in France and a "tte" tax regime applies in Turkey.

Figure 3.10. Overall tax advantage in selected OECD countries by type of benchmark savings vehicle, average earner

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



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3.3. Conclusions

This chapter has assessed whether the design of financial incentives in different countries provides an advantage when people save for retirement. The analysis has calculated the overall tax advantage resulting from the design of financial incentives for different types of pension plan as compared to a benchmark savings vehicle. This indicator represents the amount saved in taxes paid by an individual over their lifetime when contributing the same pre-tax amount to a private pension plan instead of to a benchmark savings vehicle. It includes the effect of non-tax financial incentives, such as fixed nominal subsidies and matching contributions, which are treated as tax credits paid into the pension account of eligible individuals.

In most OECD countries, the design of financial incentives provides a tax advantage when people save for retirement instead of saving in other traditional savings vehicles. The value of the overall tax advantage, however, varies and depends on the tax regime applied to pension plans and savings vehicles, as well as on the characteristics of the personal income tax system (i.e. the tax brackets and the tax rates), the income level, the amount saved, the length of the contribution period, the type of post-retirement product, the benchmark savings vehicle chosen as a comparator and other financial and economic parameters.

The amount of taxes saved by an average earner when contributing to a private pension plan rather than to a traditional savings account varies greatly across countries. Usually, the positive overall tax advantage derives from a preferential tax treatment for private pension contributions and returns on investment which is not offset by the potential taxation of benefits.

While many countries offer the largest overall tax advantage to high-income earners, there are ways to target tax advantages at low-income earners. Fixed nominal subsidies for example significantly increase the overall tax advantage for low-income earners, as the value of the subsidy is higher for them in relative terms.

Tax advantages can encourage people to save for longer periods, but not necessarily to save more in private pension plans. Indeed, individuals contributing longer can expect a larger overall tax advantage under tax treatments that exempt returns on investment. This is due to the effect of compound interest. The longer the contribution period, the longer the investment income can accumulate tax free and the larger the tax advantage on returns on investment is. On the other hand, higher contribution rates may translate into lower tax advantages because they lead to higher pension benefits that are taxed at a higher rate. Moreover, introducing ceilings on tax-deductible contributions may reduce the contribution level of high-income earners.

Straightforward and simple tax rules applying to the private pension system as a whole may increase people's trust and help to increase participation in and contributions to private pension plans. In a majority of countries, different tax regimes apply to different types of pension plan and savings vehicle at the national level. In addition, the progressivity of income tax systems and the limits that apply to certain forms of tax relief modify the tax advantage by income level. This may create confusion for people who may not have the ability to understand the differences, assess the different options and choose the best one for them.

Notes

¹ Contributions to private pension plans and savings vehicles, as well as benefits paid by these plans, can be subject to social contributions. These social contributions are usually levied on gross income to finance, among others, health care insurance, unemployment insurance, public pensions and disability pensions. They are not taken into account for the calculation of the overall tax advantage.

² Annex 3.A provides the full description of the framework and assumptions to calculate the overall tax advantage.

³ This implies that the individual's wage remains in the same income tax bracket over time.

⁴ Annuity payments are calculated according to the life expectancy at retirement given by the 2015 French life table for both sexes from the Human Mortality Database.

⁵ With an annuity certain, individuals receive a fixed number of payments, determined according to a fixed and equal for all life expectancy defined at the age of retirement. This is different from a life-long annuity, with which individuals receive payments until death.

⁶ The analysis assumes that personal income can fall into five different tax brackets with tax rates of 0%, 14%, 30%, 41% and 45% respectively. This structure is inspired from the French tax system.

⁷ With an annuity certain, individuals receive a fixed number of payments, defined according to life expectancy at the age of retirement. This is different from a life-long annuity, with which individuals receive payments until death. With programmed withdrawals, assets remain invested during retirement and the analysis assumes that individuals receive a fixed number of payments, defined according to life expectancy at the age of retirement.

⁸ The analysis however still considers a fixed time horizon for the calculations, corresponding to the remaining life expectancy at the age of retirement.

⁹ In Denmark, the negative overall tax advantage for age savings plans is due to the means-testing rules of public pensions. Assets in savings vehicles are usually included in the asset test, except for age savings plans. The individual therefore receives a larger taxable public pension in the case of the age savings plan, and pays more taxes on total taxable income. In Colombia, the average formal worker does not pay personal income tax. There is therefore no tax advantage when contributing to a private pension plan rather than to a traditional savings account.

¹⁰ Numbers are not directly comparable to those published in Chapter 2 of the *OECD Pensions Outlook 2016*. Beyond updating the tax rules from 2015 to 2018, several assumptions have been changed. In particular, the assumed contribution rate for voluntary pension schemes has been reduced from 10% to 5% because in some countries, a 10% voluntary contribution rate over a full career is likely to be rare and produces quite large pension benefits. Everything else equal, this reduced contribution rate may increase the overall tax advantage provided by "EET" tax regimes because lower contributions translate into lower assets accumulated at retirement and lower pension benefits, which in turn may fall into a lower tax bracket.

¹¹ In Canada, tax rates vary according to the province or territory. The calculations assume that the individual lives in Ontario.

¹² The calculations assume a common contribution rate across countries with voluntary funded pension systems to be able to compare. This means that the assumed contribution rate does not always represent the actual average contribution rate observed in some countries.

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Annex 3.A. Framework and assumptions

This annex describes the framework and assumptions used to calculate the overall tax advantage provided to individuals saving in a funded private pension plan in different countries. The approach used consists in comparing the tax treatment of a retirement savings plan to that of a benchmark savings vehicle, i.e. comparing how contributions, returns on investment and withdrawals are taxed in each savings vehicle. This includes the effect of government non-tax incentives, such as fixed nominal subsidies and matching contributions, which are considered as refundable tax credits paid into the pension accounts of entitled individuals.

Definition of the indicator

The overall tax advantage is defined as the difference in the present value of tax paid on contributions, returns on investment and withdrawals between a benchmark savings vehicle and a private pension plan. It represents the amount saved in taxes paid by an individual over their working and retirement years when contributing to a private pension plan instead of to a benchmark savings vehicle. This indicator is calculated for a flow of contributions made yearly over the career between an initial age, e.g. 20, and the age at which the individual retires, e.g. 65, given a constant contribution rate. It is expressed as a percentage of the present value of contributions.

The overall tax advantage allows assessing the tax advantage over the entire career of an individual by summing-up the effects of the tax treatment of private pension plans induced by a yearly flow of contributions. In addition, it can be calculated for all types of pension plan, including DB plans, and can appropriately account for caps or limits on the amount of contributions attracting tax relief and ceilings on the lifetime value of pension assets, when relevant.

The indicator is calculated for individuals on different levels of income. The level of income is expressed as a multiple of the annual average wage, from 0.2 to 16 times. The annual average wage is taken from the OECD Average annual wages database for each country. During the contribution period, wages are assumed to grow in line with inflation and productivity. The analysis assumes constant values for inflation, the growth rate of productivity, the real rate of return on assets and the real discount rate for the entire simulation (Annex Table 3.A.1).

Annex Table 3.A.1. Baseline values of parameters

Parameter	Value
Age of entry in the labour market	20
Age of retirement	Official age in each country
Inflation	2.0%
Productivity growth	1.25%
Real rate of return	3.0%
Real discount rate	3.0%

Benchmark savings vehicles

Each type of private pension plan in a given country is compared against different benchmark savings vehicles. The analysis considers at least two benchmark savings vehicles for each country: a traditional savings account and a mutual fund (or collective investment scheme). When other savings vehicles are commonly used in a given country (e.g. special savings accounts, life insurance contracts), they are also considered.

For comparability purposes, the portfolio of the benchmark savings vehicle is assumed to be the same as the one for the private pension plan. Funds are assumed to be invested in only two asset classes: fixed income and shares. Other asset classes, such as real estate or cash and deposits, are not considered.

In addition, the same post-retirement product as for the private pension plan is also assumed for the benchmark. All post-retirement products available in a country are considered. These are usually lump sum payments, life annuities (inflation-indexed or not) and programmed withdrawals.¹ Payments from annuities and programmed withdrawals are calculated according to the life expectancy at retirement given by the most recent life tables for both sexes in the Human Mortality Database (the expected age of death is therefore assumed to be fixed).²

Personal income tax system

The analysis uses the tax schedule and tax brackets in place in each country in 2018 to calculate income tax and derive marginal tax rates. Both national (respectively federal) and local (respectively state) personal income tax systems are taken into account. Personal allowances and tax credits are also taken into account when they are available to all taxpayers. The income limits for all tax brackets, the allowances and the credit amounts are assumed to be indexed to wage growth going forward, unless country-specific rules indicate otherwise.³

The calculation of contributions and their taxation

The analysis assumes the same amount of pre-tax contributions for both the private pension plan and the benchmark savings vehicle. The amount of money saved in a private pension plan can comprise employee, employer and government contributions, while the amount saved in a benchmark savings vehicle generally only comprises individual contributions. Assuming different levels of contributions to both plans would prevent distinguishing between the impact of different contribution levels and the impact of the tax treatment of private pension plans on the overall tax advantage. The analysis therefore assumes that the individual pays the full equivalent total employee and employer contribution in the benchmark savings vehicle.⁴

Government contributions only accumulate in the relevant plan for eligible individuals. Government matching contributions and subsidies are increasingly common ways to promote savings for retirement in private pension plans. These amounts are deposited in the pension account of eligible individuals. As this type of contribution is not part of the wage bill, there is no reason to count them as well for the benchmark savings vehicle. In addition, the analysis considers government contributions as a negative tax on contributions to private pension plans, which allows identifying their impact on the overall tax advantage.

Funded private pension plans based on accumulated rights (occupational DB plans)

Contribution rates in occupational DB pension plans at the national level are not easily available. In a DB plan pension, benefits are defined according to a formula based on an accrual rate, the salary and the length of employment. The level of benefits obtained for a given contribution is not known. However, the analysis calculates the contribution rate that would be needed in a plan based on assets accumulated (e.g. DC plans) to reach the same level of benefits than the DB pension plan. To that end, the analysis proceeds with the following steps:

1. Calculate the pension income received from a DB plan according to the country-specific formula;⁵
2. Calculate the equivalent amount of assets accumulated at retirement to get this annual payment by reversing the annuity formula;
3. Calculate the after-tax contribution rate needed to provide the same amount of assets at retirement with a plan based on assets accumulated (e.g. DC plan) by dividing the amount of assets calculated under step 2 by the amount of assets that would have been accumulated in a plan based on assets accumulated had the whole salary been invested over the career;
4. Taking into account the tax treatment of contributions for the DB pension plan, calculate back the tax due on contributions to the DB pension plan and the pre-tax contribution rate;
5. Use this pre-tax contribution rate for the benchmark savings vehicle. The benchmark savings vehicle and the private pension plan therefore receive the same pre-tax contribution.⁶

Even though actual contributions made to the DB pension plan are not known for certain (because there is no direct link in DB plans between contributions and benefits), step 4 uses the contribution rate calculated under step 3 to estimate how much may have been contributed to the DB plan and to approximate the tax due on these contributions, when relevant.

Funded private pension plans based on assets accumulated (DC, hybrid and personal plans)

The analysis assumes a constant contribution rate during the career for occupational DC plans, personal pension plans and occupational hybrid DB plans (in which benefits depend on a rate of return credited to contributions). A 5% contribution rate is assumed, except for private pension plans in which mandatory contribution rates or minimum contributions rates apply.⁷ Caps on contributions are applied when relevant.

Taxation of contributions

The analysis applies the specific tax treatment in place in each country for contributions to the private pension plan and the benchmark savings vehicle, respectively. When contributions are made from income that has already been taxed, as is usually the case for savings vehicles, the analysis multiplies the pre-tax contribution by the appropriate tax rate to calculate the tax already paid. The appropriate tax rate can be the individual's marginal rate of income tax (which varies depending on the level of income) or any fixed tax rate defined by regulation. When contributions are tax exempt up to a limit (expressed

either as a percentage of the salary or as an absolute amount), the analysis assumes that the individual does not make excess contributions.⁸

Tax credits, matching contributions and fixed nominal subsidies are considered as a negative tax on contributions. Tax credits and matching contributions are calculated as a proportion of after-tax contributions.

The taxation of returns on investment

The amount of assets accumulated at the end of each year is the sum of the amount of assets accumulated at the beginning of that year, the new after-tax contributions and the investment income earned. This amount is reduced by the tax due on returns on investment when these are taxed.

The tax treatment of returns on investment may depend on the portfolio composition. The analysis assumes a portfolio composed of 60% government bonds and 40% equities. When capital gains and dividends attract a different tax treatment, the analysis assumes that investment income derives one-third from dividends and two-thirds from capital gains. The analysis assumes a holding period of securities of 6.7 years when this criteria matters for the tax treatment of investment income.⁹

The calculation of withdrawals and their taxation

For DB plans, only life annuities are considered, as such plans usually promise a regular payment for life. The life annuity payment is calculated according to the country-specific formula when available. Otherwise, expected benefits from the DB pension plan are calculated as the product between the career length, a 1.5% accrual rate and the final salary.

For DC plans, personal plans and savings vehicles, the analysis calculates the annuity payment by transforming the estimated assets accumulated at retirement into a stream of annual payments. It calculates the benefit payment of an annuity certain priced using the annuity formula, based on the life expectancy at the age of retirement and a constant discount rate. The annuity payments can either be fixed in nominal terms or inflation-indexed.¹⁰

In the case of programmed withdrawals, the expected age of death is assumed to be fixed and is defined by adding the remaining life expectancy at retirement to the age of retirement. The rate of return on investment remains constant, at the same level as during the accumulation phase. The same tax treatment as the one applied during the accumulation phase is assumed to continue applying during the post-retirement phase, unless country-specific rules indicate otherwise.

After-tax withdrawals are calculated as before-tax withdrawals minus the tax due on withdrawals, calculated by applying the appropriate tax rate. The analysis takes into account the impact of public provision when calculating the tax due on withdrawals. This means that it accounts for the fact that retired individuals may also receive a taxable public pension. To that end, the analysis first estimates the level of the public pension that the individual may receive, according to the level of income while working. The OECD pension models provide the gross replacement rates from mandatory public pension schemes, taking into account potential coverage by private schemes (cf. Table 4.5 in the *OECD Pensions at a Glance 2017* for three income levels). The analysis applies the different replacement rates to final earnings depending on the individual's level of

income. Public pension payments are indexed according to country-specific rules. The derived public pension income is added to withdrawals from the private pension plan and from the benchmark savings vehicle. The total taxable income is then run through the personal income tax brackets to determine the tax due on that income.

The taxation of funds accumulated

Some countries also tax the total amount of funds accumulated in private pension plans. This tax can take several forms. In some countries (e.g. Belgium), funds accumulated (returns on investment and past contributions) are taxed at a given age. In some other countries (e.g. the United Kingdom), the total amount of funds accumulated at retirement is taxed upon withdrawal when it exceeds a certain limit. In all cases, the analysis adds this tax to any tax due on withdrawals.

Notes

¹ The model does not consider lump sum payments and programmed withdrawals for DB pension plans.

² More information on the Human Mortality Database can be found at www.mortality.org/.

³ In Chapter 2 of the *OECD Pensions Outlook 2016*, the analysis assumes that tax brackets, allowances and credit amounts are indexed to inflation.

⁴ In addition, the lowest cap on contribution (if any) applies to both plans.

⁵ When the formula is not available, expected benefits from the DB pension plan are calculated as the product between the career length, a 1.5% accrual rate and the final salary.

⁶ The resulting benefit at retirement may however differ as the tax treatment of the benchmark savings vehicle most likely varies from the one of the DB pension plan.

⁷ In Chapter 2 of the *OECD Pensions Outlook 2016*, the analysis assumes a 10% contribution rate for voluntary pension plans.

⁸ In Chapter 2 of the *OECD Pensions Outlook 2016*, the analysis assumes that all individuals contribute at the same fixed rate and may therefore contribute beyond tax-deductibility limits.

⁹ This is equivalent to assuming that 15% of the securities held in the portfolio are sold every year. Admittedly, this is based exclusively on US observations for shares. See Burman, L. and P. Ricoy (1997), "Capital gains and the people who realize them", *National Tax Journal* Vol. 50, No. 3.

¹⁰ The annuity formula is given by $P = \text{Total assets at retirement} \times \frac{1 - \frac{1 + \text{indexation}}{1 + dr}}{1 - (\frac{1 + \text{indexation}}{1 + dr})^{LE}}$ where P is the periodic payment, *indexation* is equal to 0 in the case of fixed nominal payments and is equal to inflation in the case of inflation-indexed payments, *dr* is the discount rate and *LE* is the life expectancy at retirement.

Chapter 4. Are financial incentives effective tools to increase participation in and contributions to retirement savings plans?

This chapter examines whether financial incentives are effective tools to promote retirement savings. It reviews the empirical and non-empirical literature analysing the impact of tax and non-tax financial incentives on the way individuals save for retirement. In particular, it assesses whether individuals increase their participation in, and contributions to, retirement savings plans as a response to financial incentives, and whether this is achieved through an increase in savings or a reallocation of savings.

As discussed in previous chapters, most countries encourage people to save for retirement through financial incentives. The most popular practice is to provide a tax incentive where retirement savings are taxed only upon withdrawal (“Exempt-Exempt-Taxed” or “EET” tax regime). Financial incentives for retirement savings translate into an overall tax advantage for individuals when contributing to a retirement plan rather than to another savings vehicle, in the form of a reduction in total tax paid over their lifetime. Thus, they also mean a cost to the government. It is therefore important to assess whether individuals actually respond to financial incentives by increasing their participation in and contributions to retirement savings plans.

This chapter reviews the empirical and non-empirical literature analysing the impact of financial incentives on retirement savings. The review focuses on papers that empirically assess the impact of financial incentives on the way individuals save for retirement. It covers studies in 11 OECD countries, identified through a search of peer-reviewed papers in EconLit and papers included in previous literature reviews.¹ It is important to analyse studies from a variety of countries, as general conclusions can only emerge if similar behaviours are observed in different settings.

Several conclusions can be drawn from this literature review. The effectiveness of financial incentives needs to be measured against the intended policy objective. These policy objectives are mainly increasing national savings, reallocating savings into retirement products, or developing the supplementary role of private pensions in the provision of retirement income. Tax incentives, especially the tax deductibility of contributions, encourage participation in, and contributions to, retirement savings plans for middle-to-high income earners because individuals respond to the upfront tax relief on contributions that reduces their tax liability. Low-income earners are, however, less sensitive to tax incentives, because they may lack sufficient resources to afford contributions, they may not have enough tax liability to fully enjoy tax relief, and they are more likely to have a low level of understanding of tax-related issues. Because of a number of constraints and methodological issues, it is a complex task to measure empirically whether these retirement savings are the result of people increasing their overall savings or of people reallocating savings. Studies estimate that between 9% and 100% of retirement savings represent new savings. Low-to-middle income earners are more likely to respond to tax incentives by increasing their overall savings, while high-income earners tend to reallocate their savings. Non-tax financial incentives have proved effective in raising retirement savings too, especially among low-income earners.

The chapter is structured as follows. Section 4.1 presents the main policy objectives that financial incentives are trying to reach. In light of those objectives, the following sections focus on different aspects of the impact of financial incentives on retirement savings. Section 4.2 reviews studies analysing the impact of tax incentives on individuals’ participation in and contributions to retirement savings plans. Section 4.3 focuses on studies looking at whether tax incentives for retirement savings lead to an increase in national savings or to a reallocation of savings. It also includes a discussion of the main constraints and difficulties in conducting such analyses, explaining the disparity in the results found in the literature. Section 4.4 presents empirical evidence on the effect of non-tax incentives, matching contributions and fixed nominal subsidies, on participation, contribution levels and national savings. Section 4.5 concludes.

4.1. Policy objectives when introducing financial incentives to promote savings for retirement

The best way to measure the effectiveness of financial incentives is to analyse their effect with respect to the intended policy objective.² Some countries may want to increase overall savings because they have low national savings relative to their investment needs. National savings are a source of funds for domestic investment, which is a key driver of labour productivity growth and higher future living standards. Even a country that has large overall savings may still want to reallocate savings into retirement savings plans. Increasing saving for retirement could increase long-term investment and bring higher long-term growth. Furthermore, behavioural economics teaches that people tend to save too little for retirement because of procrastination, inertia and short-sightedness. Encouraging a reallocation of savings would not increase overall national savings (combined public and private) but would earmark a greater share for retirement. In addition, recent reforms to pay-as-you go public pension systems have increased the need to develop the supplementary role of private pensions in the provision of retirement income in some countries (OECD, 2017^[1]). Providing financial incentives is intended to increase participation in and contributions to retirement savings plans in order to complement public provision, increase overall pensions and thus improve pension adequacy. They can also help to prevent people relying on the public safety net, which would otherwise increase budgetary expenditures.

The effectiveness of financial incentives also depends on the design and generosity of the public pension system. In countries where the public pension system already offers high replacement rates, the need for extra savings is low. However, one needs to bear in mind potential financial sustainability issues. In the same way, if contributions to the public pension system are already large, individuals may not be willing to part with additional pension contributions. In both cases, financial incentives would need to be larger to overcome any reservations about putting money aside for retirement.

In light of those broad objectives, Sections 4.2 to 4.4 assess the impact of financial incentives on participation in and contributions to retirement savings plans, as well as whether financial incentives lead to an increase in national savings or to a reallocation of savings.

4.2. The impact of tax incentives on participation in and contributions to retirement savings plans

This section looks at the international evidence on how individuals respond to tax incentives through participation in, and contributions to, retirement savings plans. Tax incentives for retirement savings come from a differential tax treatment as compared to other savings vehicles (for which contributions are made from taxed earnings, returns on investment are subject to income tax and withdrawals are tax exempt) and can take the form of tax exemptions, tax deductions, tax credits or tax rate reliefs (cf. Chapter 2).

Tax exemptions and tax deductions reduce an individual's taxable income. The reduction in tax liability associated with the deduction or exemption depends on an individual's marginal tax rate. For example, in many countries, contributions to retirement savings plans are deducted from income (fully or partially) before calculating the tax due, while investment earnings are excluded from the tax base. By contrast, tax credits directly reduce tax liability. A tax credit may be calculated as a proportion of the contributions paid into a retirement savings plan for instance. Tax credits are classified as "non-

refundable” when the value of the credit cannot exceed the tax liability. Finally, tax rate reliefs reduce the tax rate applied on the income flow. For all these tax treatments, caps can be introduced to limit tax relief.

A first group of studies examines the effect of personal income tax rates and tax brackets on participation in and contributions to retirement savings plans when contributions to such plans are either deductible from income or taxed at a reduced fixed rate. Some studies exploit the fact that deductible contributions are capped and look at the impact of a change in the cap. The last studies considered in this section look at the impact of tax credits on retirement savings.

Effect of personal income tax rates and tax brackets

The empirical evidence reviewed here indicates that the design of the personal income tax system, in terms of tax rates and tax brackets, can encourage participation in and contributions to retirement savings plans for which contributions are deductible from taxable income. The evidence is less conclusive when contributions are taxed at a reduced fixed rate. In most countries, the personal income tax system is progressive, meaning that marginal tax rates increase with taxable income. Therefore, tax relief on contributions increases when taxable income jumps from one tax bracket to the next. The following studies examine how the design of the personal income tax system and reforms affecting tax rates influence participation in and contribution levels to such tax-favoured plans. In all these studies, the authors include controls for the level of income, so that the tax effect is not distorted by the effect of income.

Milligan (2002_[2]) finds that marginal tax rates affect moderately the decision to contribute to Registered Retirement Savings Accounts (RRSPs) in **Canada**. RRSPs are personal pension plans for which contributions are deductible from income, investment earnings are exempt from taxation and withdrawals are taxed as income (“EET”). Using repeated cross-sections of the Family Expenditure Survey between 1982 and 1996, the author determines the effect of marginal tax rates, which vary over time and across provinces, on RRSP participation. He finds that marginal tax rates influence households’ decisions to participate in an RRSP, but this influence is relatively small. A 10 percentage point increase in the marginal tax rate is estimated to increase the probability of participation by 8%. This tax effect only explains 5.1% of the trend in RRSP participation between 1982 and 1996.

Focusing on self-employed individuals in **the United States**, Power and Rider (2002_[3]) argue that taxes have a substantial effect on both the decision to contribute and the amount contributed to tax-favoured retirement savings plans. Self-employed individuals in the United States have access to Keogh plans and Simplified Employee Pension (SEP) plans. Under such plans, the self-employed person is treated as an employee of himself and can make tax-deductible contributions, up to certain limits. Using a panel of sole proprietors constructed from the Statistics of Income individual income tax files for 1985, 1989 and 1993 the authors determine the effect of changes in tax rates due to several tax reforms on participation in and contributions to Keogh and SEP plans. They distinguish the effect on low- and high-income earners, who were affected differently by the reforms. They calculate the tax price of contributions as $(1-\mu_C)/(1-\mu_W)$, where μ_C and μ_W represent respectively the marginal tax rate on contributions and the marginal tax rate on withdrawals, so that the tax price increases when the tax incentive is reduced. They find that the tax price of contributions has a substantial effect on both the decision to contribute and the amount contributed to Keogh and SEP plans by the self-employed. The

estimates suggest that a 1% increase in the tax price results in a 0.25 percentage point decrease in the probability of contributing and in a 2% decrease in contributions.

Crawford, Disney and Emmerson (2012^[4]) provide empirical evidence that individuals facing higher marginal tax rates respond to tax incentives by increasing their participation in tax-favoured retirement savings plans. The authors examine whether participation in and contributions to private pension plans in *the United Kingdom* increase at the higher rate threshold for income tax. Since tax relief is given at the marginal tax rate through tax-deductible contributions, participating in a private pension plan should be more attractive to individuals just above the higher rate threshold than to those just below it in terms of immediate tax relief on contributions. The test is not simply to assess whether higher-income earners are more likely to participate in a pension plan but whether there is a discontinuity in participation at the higher rate threshold. Using repeated cross-sections of the Family Resources Survey between 2000-01 and 2008-09, the authors find evidence that individuals above the higher rate threshold of income tax are more likely to be members of a pension scheme. The authors however warn that this result should be interpreted with caution, as this could be either because the tax relief on contributions increase at that point or because, more generally, becoming a higher rate taxpayer has an effect on the individual's perception of the need for tax planning. In addition, they find no evidence of an increase in the contribution rate at the higher rate threshold.

Carbonnier, Direr and Slimani Houti (2014^[5]) find that high-income earners in *France* respond to the presence of tax incentives by contributing more to retirement savings accounts that mandate annuitisation at retirement (e.g. PERP plans). The authors use a large micro-file tax return dataset that includes incomes earned between 2006 and 2009. They first calculate the distance between the taxable income (i.e. household's income net of all contributions in tax-deferred savings accounts) and the income tax thresholds so as to check whether individuals save in tax-favoured pension plans in order to declare a taxable income that would fall into a lower tax bracket. They then compare the contribution level to retirement savings accounts of two groups of individuals: i) those whose taxable income is higher than but close to a given tax threshold; and ii) those whose taxable income is just below the same threshold. They conduct this comparison at different tax thresholds and for different age groups.³ The authors find no evidence of individuals saving in order to reduce taxable income and fall into a lower tax bracket. However, they find that the tax incentive is effective in increasing contributions to PERP plans for high-income earners whose marginal tax rate is the highest, especially for those aged 45 and above.

Unfortunately, among low-income earners, the combination of a progressive tax system and tax-deductible contributions may not be effective in encouraging savings for retirement. Carbonnier, Direr and Slimani Houti (2014^[5]) find that low-income earners aged 45 to 55 do not increase their contribution level when their marginal tax rate increases. This suggests that the structure of the income tax system is not the main factor for low-income earners in deciding what their contribution level should be.

Harju (2013^[6]) shows that the 2005 tax reform in *Finland* affected individuals' participation in and contributions to voluntary personal pension plans. Before the reform, contributions to personal pension plans were deducted from labour income, returns on investment were exempt from taxation and retirement benefits were taxed as labour income. Since the reform, contributions are deducted from capital income and benefits are taxed as capital income (returns are still tax exempt). The tax schedule of personal pension plans therefore changed from progressive to proportional, as capital income is

taxed at a fixed rate. In other words, tax relief on contributions increased for low-income earners (their contributions are deducted at a higher rate since the reform) and decreased for high-income earners (their contributions are deducted at a lower rate since the reform). The author compares the change in personal pension participation and contributions of individuals affected by the 2005 reform and individuals not affected. He uses panel data covering the period from 2000 to 2007. The reform altered saving behaviour by reducing personal pension plan participation among high-income earners by 4 percentage points and increasing it among low-income earners by 1 to 2 percentage points. The reform also reduced annual contributions among high-income earners by over 20%. The estimated effects result entirely from the changed savings behaviour of men.

Finally, Feng (2014^[7]) fails to demonstrate a positive impact of a reduced tax rate on contributions on participation in salary sacrifice arrangements in *Australia*. A salary sacrifice arrangement is where employees agree contractually and voluntarily to give up part of the remuneration that they would otherwise receive as salary or wages, in return for their employer providing contributions to a superannuation fund of the same amount. Salary sacrifice contributions attract a favourable tax treatment, being taxed at a fixed rate of 15% (same as for mandatory employer contributions), rather than at the marginal income tax rate. Using data from wave 10 of the Household Income and Labour Dynamic in Australia survey, the author determines the effect of higher tax relief on contributions on the participation in salary sacrifice arrangements at two marginal tax rate jump points of the personal income tax system, from 15% to 30% and from 30% to 38%. The results indicate that tax rate relief leads to a small but insignificant increase in participation in salary sacrifice arrangements. The author explains that this result is likely due to the complexity of the incentive schemes and competing demands for long-term savings in Australia.

Effect of changes in caps on tax-relieved contributions

Another group of studies provides evidence that individuals react to changes in caps on tax-relieved contributions. When contributions to tax-favoured retirement savings plans are deductible from income, there is usually a cap on the amount of contributions that attract tax relief. Reducing or increasing this cap influences the level of contributions, and also potentially the participation in tax-favoured retirement savings plans.

Milligan (2003^[8]) finds that future changes in contribution limits have an impact on current contributions to RRSPs in *Canada*. Contribution limits for RRSPs underwent reform in 1990 and 1991. Using panel data of tax filers between 1987 and 1991, the author looks at the effect of a future change in the contribution limit on the change in current contributions for individuals who were affected differently by the reforms. He finds a negative relationship between future contribution limits and current contributions. The intuition behind this result is the following. When future contributions to the tax-preferred savings account are constrained by a contribution limit, current contributions increase in order to make use of the contribution room while it is available. The author calls it the “use-it-or-lose-it” motivation to contribute. By contrast, when the limit increases, a larger contribution may be made in the future. This diminishes the need of the taxpayer to contribute today.

Disney, Emmerson and Wakefield (2007^[9]) show that the change in the tax regime in 2001 in *the United Kingdom* affected participation in and contributions to personal pension accounts. Together with the introduction of Stakeholder Pensions in April 2001, the government changed the structure of tax relief which implied a significant increase in

contribution limits to private pensions for low-income earners, especially for younger age groups. Using repeated cross-sections from the Family Resources Survey between 1999–2000 and 2002–03, the authors compare private pension participation before and after the change in the tax regime for those who were potentially affected by the contribution limit increase and for those who were not. They find that the change in the contribution limits affected both participation rates and contributions to private pensions among low-income earners, especially women and people living in couples. Private pension participation increased by around three percentage points more among individuals who were affected by the reform than among those who were not affected. Evidence also suggests an increase in contributions to private pensions among those affected by the reform: around GBP 0.8 per week for singles and GBP 4.3 per week per individual in couples.

Finally, Rutledge, Wu and Vitagliano (2014^[10]) argue that the “catch-up” provision is effective in increasing contributions to 401(k) pension plans in *the United States*. The catch-up provision was enacted in 2001 and extends the 401(k) contribution limit for workers older than 50. In particular, the higher limit provides an incentive for workers previously constrained by the limit to increase their contributions, but does not change the incentive for workers unconstrained by the limit. The authors use longitudinal U.S. Social Security Administration data on tax-deferred earnings linked to the Survey of Income and Program Participation for the period from 1999 to 2005. They compare the change in 401(k) contributions for maximum contributors just after the age of 50 to similar participants just under 50, in the years around the policy change. The study finds that, compared with similar workers under 50, contributions increased by USD 540 more among individuals aged 50 and older who had approached the 401(k) contribution limits prior to turning 50. This suggests that older workers previously constrained by the contribution limit respond to the expanded contribution limit. The authors estimate that a one-dollar increase in the contribution limit leads to a 49-cent increase in 401(k) contributions.

Effect of tax credits

Tax incentives can also take the form of tax credits. The only available studies on tax credits refer to the Saver’s Credit in *the United States*, which supplements “EET” tax incentives for low and middle-income earners. The Saver’s Credit is a tax credit introduced in 2002 and designed to encourage retirement savings among low and middle income households. These individuals can claim a non-refundable tax credit on retirement contributions of up to USD 2 000 made to private pension plans, with credit rates equal to 10%, 20% or 50% at different income thresholds.

The take-up rate for this programme is very low. According to the Internal Revenue Service, in 2015, only 5.4% of all tax filers received a tax credit and the average credit was USD 178, far below the maximum USD 1 000. This low participation number is partially explained by the fact that the statistics consider all tax filers while only low and middle-income earners are eligible for the credit. Brown and John (2017^[11]) provide several potential explanations for the limited impact of the programme. First, many low and middle-income earners do not contribute to private pension plans, mostly because they do not have access to occupational plans at their job.⁴ Second, many do not apply for the credit because of a general lack of awareness of the credit and the complexity of the claim form. Third, low-income earners may not have sufficient tax liability to receive the tax credit because it is non-refundable.

In addition, there are no studies showing that a higher credit rate increases contributions to private pensions. Ramnath (2013^[12]) examines whether taxpayers underreport their income in order to receive a higher credit rate and analyses whether households that receive a higher credit rate contribute more. She uses Public Use Tax Files between 2001 and 2006 from the Internal Revenue Service and finds that taxpayers had a reported income just below the thresholds created by the Saver's Credit more often after than before the introduction of the Saver's Credit. However, when looking at the impact of changes in the credit rate on changes in average retirement contributions among taxpayers claiming the credit and having a reported income around the income thresholds, she finds no statistically significant evidence that receiving a higher credit rate increases individual contributions to private pensions.

4.3. Do tax incentives lead to an increase in national savings or to a reallocation of savings?

There is a debate on whether tax incentives for retirement savings plans increase retirement savings as a result of people actually increasing their overall savings (new savings) or as a result of people reallocating savings from other traditional savings vehicles. This question is important, as policies that create tax-favoured savings accounts are costly for the government in terms of forgone tax revenues. To (partially) offset this cost, tax incentives should therefore increase national savings. However, even if they fail to do so, tax incentives may still be a valuable mechanism to encourage people to earmark savings for retirement, in order to make sure that they have enough resources to finance retirement and do not fall into the public safety net once retired (Börsch-Supan, 2005^[13]).

Tax incentives may increase national (public plus private) savings depending on the source of the contributions. Contributions to tax-favoured retirement savings plans may come from three different sources: money that would have otherwise been consumed, savings transferred from previously existing assets or that would have been done anyway (in the absence of tax incentives), and savings associated with higher disposable income resulting from the tax break (Antón, Muñoz De Bustillo and Fernández-Macias, 2014^[14]). Pension contributions represent a net addition to national savings only in the first case. Private savings rise if contributions come from a higher level of disposable income because of the tax relief, but the net effect on national savings is null because the increase in private savings is offset by a reduction in public saving, because of the forgone tax revenues.

Hubbard and Skinner (1996^[15]) summarise the two extreme positions in the debate that started in the late 1990s in *the United States*. On the one hand, Poterba, Venti and Wise (1996^[16]) argue that, thanks to the tax incentives, the assets accumulated in IRAs and 401(k) plans are mostly net additions to savings. On the other hand, Engen, Gale and Scholz (1996^[17]) consider that tax incentives for retirement savings have little to no effect on the level of savings. They find that most of the reported increase in financial assets in IRAs between 1984 and 1991 can be attributed to stock market booms, higher real interest rates, and shifts in non-financial assets, debt, pensions and Social Security wealth. They conclude that tax incentives have a strong effect on the allocation of savings and wealth, but not on the level. Hubbard and Skinner (1996^[15]) argue that probably “the truth lies somewhere between the two extremes of no new saving and all new saving”. For them, IRAs and 401(k) plans appear to stimulate moderate amounts of new savings. A conservative estimate of the effect of IRAs on personal savings would be about 26 cents

per dollar of IRA contribution. As for 401(k) plans, they argue that these plans should largely represent new savings for low-income and younger 401(k) contributors, as these individuals hold little in the form of other financial assets or home equity.

The remainder of the section focuses on the literature since 2000 and splits the studies between those finding evidence supporting the claim that tax incentives lead to an increase in national savings, those finding evidence supporting the claim that tax incentives mainly lead to a reallocation of savings and finally, those finding evidence that the effect of tax incentives differs across income groups. The various studies and their results are summarised in Table 4.1. The section also includes a discussion that reviews some of the main constraints and difficulties that make the empirical measurement of the impact of tax incentives on national savings a complex task.

Table 4.1. Studies on the impact of tax incentives for retirement savings on national savings

	Title	Country	Period covered	Main results
Tax incentives lead to an increase in national savings				
(Benjamin, 2003 ^[18])	Does 401(k) eligibility increase saving? Evidence from propensity score subclassification	United States	1991	On average, about one half of 401(k) balances represent new private savings, and about one quarter of 401(k) balances represent new national savings.
(Ayuso, Jimeno and Villanueva, 2007 ^[19])	The effects of the introduction of tax incentives on retirement savings	Spain	1985-1991	The overall amount of new saving estimated is at most 25 cents per euro contributed on average.
(Guariglia and Markose, 2000 ^[20])	Voluntary Contributions to Personal Pension Plans: Evidence from the British Household Panel Survey	United Kingdom	1992-1998	Voluntary contributions to personal pension plans are made essentially for retirement purposes, whereas conventional saving is undertaken for precautionary motives. There is no evidence of a negative relationship between the two types of savings, therefore they are unlikely to offset each other completely.
(Rossi, 2009 ^[21])	Examining the interaction between saving and contributions to personal pension plans: Evidence from the BHPS	United Kingdom	1994-2003	Additional contribution put aside in a personal pension plan would have no detrimental effect on ordinary savings, but would actually increase them. The two savings products are therefore complementary and not substitutes.
(Gelber, 2011 ^[22])	How do 401(k)s affect saving? Evidence from changes in 401(k) eligibility	United States	1996	In response to 401(k) eligibility, IRA assets increase and the value of individuals' cars decreases, suggesting an increase in national savings.
(Beshears et al., 2017 ^[23])	Does Front-Loading Taxation Increase Savings? Evidence From Roth 401(K) Introductions	United States	2006-2010	There is no evidence that total 401(k) contribution rates differ between employees hired before versus after Roth introduction, which implies that take-home pay declines and the amount of retirement consumption being purchased by 401(k) contributions increases after Roth introduction.
Tax incentives lead to a reallocation of savings				
(Attanasio and DeLeire, 2002 ^[24])	The effect of individual retirement accounts on household consumption and national saving	United States	1982-1990	Households mostly financed their IRA contributions from existing savings or from saving that would have been done anyway. At most, 9% of IRA contributions represented net additions to national saving.

	Title	Country	Period covered	Main results
(Attanasio, Banks and Wakefield, 2004 ^[25])	Effectiveness of tax incentives to boost (retirement) saving: Theoretical motivation and empirical evidence	United Kingdom and United States	1998-2002 and 1982-1990	Only relatively small fractions of funds in tax advantaged accounts (IRAs in the US, TESSAs and ISAs in the UK) can be considered to be new saving.
(Pence, 2002 ^[26])	401(k)s and household saving: New evidence from the Survey of Consumer Finances	United States	1989-1998	The 401(k) programme had a small, if any, effect on saving over the 1989-1998 period. The wealth of eligible households did not grow relative to the wealth of ineligible households between 1989 and 1998, either in the aggregate or within income categories, even when non-401(k) retirement assets are added to the wealth measure.
(Antón, Muñoz De Bustillo and Fernández-Macias, 2014 ^[14])	Supplementary private pensions and saving: evidence from Spain	Spain	2002-2005	Tax-favoured contributions to a pension fund are not associated with a lower consumption level, which implies that this policy does not increase national saving. However, there is no clear evidence that pension fund contributions come from reshuffling other household assets or saving that would have been done anyway. Therefore, at most, it seems that this tax relief would increase private household saving but not national saving, as the additional saving would come from the higher disposable income allowed by the existence of the tax relief.
(Chetty et al., 2014 ^[27])	Active vs. passive decisions and crowding out in retirement savings accounts: Evidence from Denmark	Denmark	1995-2009	Approximately 15% of individuals are “active savers” who respond to tax subsidies primarily by shifting assets across accounts. 85% of individuals are “passive savers” who are unresponsive to subsidies but are instead heavily influenced by automatic contributions made on their behalf.
(Paiella and Tiseno, 2014 ^[28])	Evaluating the impact on saving of tax-favoured retirement plans	Italy	1989-2006	The pension fund legislation in Italy had a strong effect on the allocation of saving and triggered substantial substitution of non-tax-favoured non-retirement wealth for tax-favoured pension funds. In contrast, it had little, if any effect on household saving flows.
The effect of tax incentives on national savings depends on the income level				
(Engelhardt, 2000 ^[28])	Have 401(k)s raised household saving? Evidence from the Health and Retirement Study	United States	1992	Even though very little of the average dollar of 401(k) wealth appears to be new household saving, 401(k)s may have stimulated saving significantly for lower-to middle income households.
(Engen and Gale, 2000 ^[29])	The effects of 401(k) plans on household wealth: Differences across earnings groups	United States	1987-1991	The effects of 401(k)s on household wealth vary significantly by earnings level. 401(k)s held by groups with low earnings, who hold a small portion of 401(k) balances, are more likely to represent additions to net wealth than 401(k)s held by high-earnings groups, who hold the bulk of 401(k) assets. Overall, between 0 and 30% of 401(k) balances represent net additions to private saving in the sample period.
(Chernozhukov and Hansen, 2004 ^[30])	The effect of 401(k) participation on the wealth distribution: An instrumental quantile regression analysis	United States	1991	The effects of 401(k) participation on net financial assets are positive and significant over the entire range of the asset distribution, and the increase in the low tail of the assets distribution appears to translate completely into an increase in wealth. However, there is

	Title	Country	Period covered	Main results
				significant evidence of substitution from other forms of wealth in the upper tail of the distribution.
(Engelhardt and Kumar, 2011 ^[31])	Pensions and household wealth accumulation	United States	1992	Each dollar of pension wealth is associated with a 53 to 67 cent decline in non-pension wealth, meaning that pension wealth also raises total household wealth. In addition, most of the crowding-out effect is concentrated in higher-wealth households, with a decline in non-pension wealth of 30 to 75 cents per dollar of pension wealth.

Evidence for an increase in national savings

A first group of studies, mostly in *the United States*, concurs with Poterba, Venti and Wise (1996^[16]) that, on aggregate, tax incentives increase retirement savings through an increase, at least moderate, in national savings.

Benjamin (2003^[18]) estimates that, on average, about half of 401(k) balances represent new private savings and about one quarter represents new national savings. Using cross-section data from the 1990 Survey of Income and Program Participation, the author compares the wealth of 401(k) eligible and ineligible households within subgroups constructed according to a method that ensures that households in the same subgroup are comparable on many characteristics.⁵ The author estimates that, on average, about one quarter of aggregate 401(k) assets represents new national savings, one quarter represents savings done due to the tax break on contributions (i.e. forgone tax revenues), and one quarter results from conversions from pre-existing defined contribution (DC) plans or reduced defined benefit (DB) promises. The last quarter presumably represents reallocation from other asset classes, in particular home equity. In addition, he finds that responses to eligibility vary considerably across households, with households who normally save the most (homeowners, IRA participants, the better educated) largely reallocating other savings into 401(k) plans and not increasing their overall savings.

Ayuso, Jimeno and Villanueva (2007^[19]) find a small but significant impact of tax incentives on savings, especially for high-income earners aged 46 to 55. The authors examine the impact of the introduction of tax-favoured private pension funds in *Spain* in 1988 on contributions to pension funds and on savings. Using a panel of income tax returns, the authors first observe that individuals in the top income quartile contribute more to private pension plans. The second part of their analysis therefore focuses on these individuals. Using the 1985-1991 waves of the Household Expenditure Survey they compare the consumption growth of individuals aged 36 to 65 to that of individuals younger than 35, before and after the introduction of private pensions. They find small consumption drops among individuals close to retirement age (aged 56 to 65 years old), the group that most actively contributed to the plan. They find a larger decrease in consumption expenditures for individuals aged 46 to 55. One way to interpret the results could be that households close to retirement consider pension funds and other savings forms as strong substitutes, and tend to contribute up to the tax-deductibility limit by reallocating their savings. By contrast, younger households, with plausibly less accumulated wealth and for whom contribution limits are less likely to be binding, need to increase their savings to take advantage of the tax incentives. They estimate that the overall amount of new savings is at most 25 cents per euro contributed on average.

Guariglia and Markose (2000^[20]) and Rossi (2009^[21]) find that contributions to personal pension schemes do not reduce ordinary savings in *the United Kingdom*. Both studies use several waves of the British Household Panel Survey (between 1992-1998 and 1994-2003, respectively) to analyse the displacement effect on savings due to the introduction of personal pension plans. Guariglia and Markose (2000^[20]) examine the determinants of savings in personal pension plans and compare with those for conventional savings. They conclude that the two types of savings are accumulated for different purposes: voluntary contributions to personal pension plans are made essentially for retirement purposes, while conventional saving is undertaken for precautionary motives. In addition, they find no evidence of a negative relationship between the two types of savings, concluding that they are unlikely to offset each other completely. Rossi (2009^[21]) determines the effect of private pension contributions on ordinary savings and models simultaneously the two decisions of saving, in ordinary forms and in personal pensions. She concludes that an additional contribution put aside in a personal pension plan would have no detrimental effect on ordinary savings, but would actually increase them. The two savings products are therefore complementary and not substitutes, as those respondents who save in pension forms also have higher savings.

Gelber (2011^[22]) compares two groups of individuals eligible for 401(k) plans and shows that becoming eligible increases 401(k) balances, without reducing savings in other financial assets. Using longitudinal data on households' savings from the 1996 Survey of Income and Program Participation, the author uses the fact that some employers impose a vesting period in their 401(k) plan to identify employees who change eligibility status. The author therefore compares the change in household savings of individuals who become eligible for a 401(k) plan in their second year in a job and individuals who remain eligible over the same period. Unsurprisingly, he finds that 401(k) eligibility raises 401(k) balances. The author did not find statistically significant evidence that 401(k) eligibility impacts savings in other financial assets, although the confidence intervals are so large that the author cannot completely rule out a negative impact. He also finds that, in response to 401(k) eligibility, IRA assets increase and the value of individuals' cars decreases (the car value could be considered as a proxy for consumer durables as a whole), suggesting an increase in national savings.

Finally, using the introduction of a Roth option on 401(k) contributions in 2006, Beshears et al. (2017^[23]) argue that upfront taxation increases savings. Since 1 January 2006, employers have had the option to include a Roth contribution alternative in their 401(k) retirement savings plan. Roth 401(k) contributions are not tax-deductible in the contribution year, but investment earnings and withdrawals in retirement are tax free (upfront taxation, "TEE"). This contrasts with traditional 401(k) accounts, for which contributions are tax-deductible in the contribution year, investment earnings are tax free and withdrawals are taxed ("EET"). With a Roth 401(k) option, individuals have the possibility of reducing their contributions to their 401(k) plan to keep the level of future, after-tax, retirement income constant. Using administrative data from 11 companies that added a Roth contribution option to their existing 401(k) plan between 2006 and 2010, the authors find no evidence that total 401(k) contribution rates differ between employees hired before and after introducing a Roth option, after controlling for differences in the socio-economic characteristics of the two cohorts of employees. In order to explain this result, the authors ran an online survey experiment on 7 000 DC plan participants. Respondents were asked to make a recommendation about a 401(k) contribution rate for an imaginary couple. Consistent with the previous findings, the authors find evidence that individuals are confused about and neglect the tax properties of traditional and Roth

401(k) accounts. The experimental results also suggest that “partition dependence” helps keep total contribution rates constant when a Roth option is introduced. Partition dependence results from a bias towards allocating an equal amount to every discrete option available in a choice set and predicts an increase in total savings when the choice set is larger, for example {current consumption, traditional 401(k) savings, Roth savings} instead of {current consumption, traditional 401(k) savings}.

Evidence for savings reallocation

Another body of the literature tends to argue that the increase in retirement savings following the introduction of tax incentives is mostly the result of savings reallocation, rather than new savings.

Attanasio and DeLeire (2002^[24]) and Attanasio, Banks and Wakefield (2004^[25]), argue that both in the United Kingdom and the United States, only relatively small fractions of assets in tax-favoured accounts can be considered to be new savings. For *the United States*, the authors compare changes in consumption, saving rates and non-IRA financial assets between two groups of individuals: “new IRA contributors” (households that just opened an IRA account) and “continuing IRA contributors” (households that previously had made IRA contributions). They use panel data from the Consumer Expenditure Survey between 1982 and 1990. The authors find no evidence that households financed their IRA contributions from reductions in consumption, at least in the first nine months following their initial participation in an IRA plan. They find evidence that households financed their IRA contributions from existing savings or from savings that would have been done anyway. Their results indicate that, at most, 9% of IRA contributions represented net additions to national savings.

For *the United Kingdom*, Attanasio, Banks and Wakefield (2004^[25]) look at some descriptive statistics following the introduction of two specific savings vehicles with upfront taxation: Tax Exempt Special Savings Accounts (TESSAs) and Individual Savings Accounts (ISAs). TESSAs were introduced in 1991 and were subsequently replaced by ISAs in 1999. For both accounts, contributions are paid from net income and there is no subsequent tax on returns and withdrawals (“TEE”). The total amount that can be contributed to both accounts each year is limited. Looking at the average size of TESSA balances between 1991 and 1999, the authors observe a regular pattern of large contributions at the beginning of the year, followed by no further contributions for the rest of the fiscal year. They claim that this pattern would not typically be associated with reduced consumption patterns, but would rather signal a reallocation of assets. Using data from the Family Resources Survey between 1998 and 2002, the authors also show that the increase in participation rates of tax-favoured savings products following the introduction of ISAs was not concurrent with an increase in ownership of assets more generally, suggesting that ISAs did not encourage new savings.

Pence (2002^[26]) finds that eligibility for 401(k) plans has a small but not significant effect on savings in *the United States*. The author compares changes in wealth of 401(k) eligible and ineligible workers between 1989 and 1998, using repeated cross-sections of the Survey of Consumer Finances. Although real median 401(k) balances grew substantially, from USD 4 000 in 1989 to USD 11 000 in 1998, the wealth of eligible households did not grow relative to the wealth of ineligible households. This result holds across income groups and when non-401(k) retirement assets are added to the wealth measure. The author concludes that differences in saving taste and initial wealth are likely

to better explain the large account balances that eligible households accumulated over the 1990s, than the tax incentives embedded in 401(k) plans.

Contrary to Ayuso, Jimeno and Villanueva (2007^[19]), Antón, Muñoz De Bustillo and Fernández-Macías (2014^[14]) argue that tax incentives for retirement savings in *Spain* do not increase national savings. The authors assess the effect of participation (enrolment and contributions) to a pension plan on three different dependent variables: consumption, non-pension assets and total wealth. They use longitudinal data from the Spanish Survey of Household Finances of 2002 and 2005. The results suggest that contributions to pension funds do not increase national savings since they are not associated with a reduction in consumption. However, the evidence is inconclusive on the link between pension fund contributions and households' non-pension assets and total wealth, meaning that these contributions may not come from a reallocation of other household assets or saving that would have been done anyway. In that case, the tax incentive would lead to an increase in private household savings but not in national savings, as the additional savings would come from the higher disposable income allowed by the existence of the tax relief.

Using panel data on savings covering the population of *Denmark*, Chetty et al. (2014^[27]) show that tax incentives primarily induce individuals to reallocate assets from taxable accounts to tax-favoured retirement savings plans. The authors use a panel dataset that registers the wealth and savings of over 4 million individuals from 1994 to 2009. They assess the effect of tax incentives on total household savings by examining how individuals responded to a tax reform in 1999. That year, the government reduced the deduction that high-income earners could make for contributions to “capital” pension accounts, which are accounts that provide lump-sum payments at retirement. That reform, however, left unchanged the tax treatment of contributions to accounts that provide annuity payments.⁶ The authors compare the change in pension and non-pension savings for individuals with incomes above and below the income threshold for the top tax bracket. Individuals in the top income tax bracket significantly reduced their contributions to capital pensions following the reform. However, this reduction was driven by only 19% of the high-income earners affected by the reform, who changed their saving behaviour by reducing or stopping contributions to capital pensions. These “active savers” redirected nearly all that saving to annuity pension plans and other savings accounts, leaving their overall savings mostly unchanged. The vast majority of the workers affected by the reform were “passive savers” who continued to contribute the same amounts to both types of retirement plan and to other savings accounts. The authors conclude that the entire increase in retirement savings attributable to the previous level of the tax incentive had come from money that would have been saved, and was now being saved, in taxable savings accounts.

Finally, Paiella and Tiseno (2014^[32]) find that the pension fund legislation passed in *Italy* in 1993-1995 had a negligible effect on saving rates. This reform was issued with the explicit goal of raising private long-term savings to offset the reduction in public pension benefits. It encouraged the creation of a proper private pension system to supplement public pensions by establishing pension funds as separate legal entities subject to a set of specific rules. It was aimed at increasing participation rates and ensured a favourable tax treatment for contributions (tax-deductible up to a limit) and withdrawals (taxed at favourable rates). To assess whether tax incentives of pension fund contributions have a positive effect on household savings, the authors compare changes in saving rates of pension fund contributors and non-contributors before and after the reform, using repeated cross-sections of the Survey on Household Income and Wealth between 1989 and 2006. The results show that the reform had a negligible effect on saving rates but led

to a significant reduction in liquid financial assets (bank accounts and government bonds), suggesting a reallocation of savings.

Why is there such a disparity of results?

This section discusses the reasons behind such a disparity of results. It summarises some of the constraints and difficulties making the empirical measurement of whether tax incentives for retirement savings plans lead to an increase in national savings a complex task. There are a number of methodological issues that the different studies try to address in different ways. Without getting into sophisticated econometric and statistical explanations, some of the main issues are described below.

The first issue is that the effect of tax-favoured retirement plans on savings is difficult to measure accurately with the data at hand. Ideally, one would need to run an experiment where individuals would be split randomly into two groups. The individuals in the two groups would share the same characteristics overall and would be treated exactly in the same way, except that one group would be allowed to participate in a tax-favoured plan (“treatment group”), while withholding this possibility from the other group (“control group”). In this way, access to the tax-favoured plan is independent from individuals’ characteristics (and in particular their preferences to save) and this ensures that, when comparing total savings in the two groups, any difference can be attributed to the effect of the tax incentive only. Unfortunately, such random experiments are not easy to run and econometricians need to mimic the ideal experiment using data at hand.

In the case of private pension plans in general, what is observable in the data is the participation in these plans rather than the access to them. However, private pension contributors usually consist of households with stronger preferences to save, which means that they also save in other vehicles. The comparison of savings between contributors and non-contributors therefore combines effects of both the preference to save and the tax incentive.

In the case of the United States, it is possible to observe individuals’ eligibility for 401(k) pension plans. Some authors see this eligibility status as independent from the preferences to save, as only individuals whose employer establishes a 401(k) plan are eligible to contribute to such a plan (Benjamin, 2003^[18]; Poterba, Venti and Wise, 1996^[16]). They consider that, as eligibility is determined by employers, eligible and ineligible households are likely to have comparable preferences to save. However, other authors (Bernheim, 2002^[33]; Engen, Gale and Scholz, 1996^[17]) criticize this, claiming that employees with strong preferences to save probably tend to choose jobs that provide access to 401(k) pension plan, and that employers may consider employees’ preferences when deciding to set up a 401(k) plan. To address the possibility that eligibility correlates across individuals with their unobserved preferences to save, Gelber (2011^[22]) examines a change in eligibility status, using the fact that some employers impose a vesting period in their 401(k) plan. He therefore compares two groups of eligible workers who plausibly have comparable preferences to save.

Another issue is that there is a trade-off between controlling for many variables that may interact with households’ preferences to save and the precision of the estimates. It is necessary to control for factors that can influence savings decisions in order to isolate the effect of tax incentives in the models. However, savings (and consumption) can be influenced by many factors. For example, age, gender, marital status, education, income and the number of children are some of the demographic and socioeconomic characteristics that influence savings decisions. Reforms affecting the generosity of

public pensions also interact with savings decisions. Many studies document the effect of public pension wealth on savings and report a decline in savings for each unit of increase in public pension wealth (Alessie, Angelini and Van Santen, 2013^[34]; Disney, 2006^[35]; Hurd, Michaud and Rohwedder, 2012^[36]; Lachowska and Myck, 2015^[37]). There is therefore a trade-off between adding control variables and the precision of the estimates. Benjamin (2003^[18]) overcomes this problem by classifying 401(k) eligible and ineligible households within subgroups defined according to the propensity score method. This method allows for controlling for a large number of household characteristics without reducing the precision of the estimates.

The choice of the dependent variable is important to determine whether tax incentives may have an impact on private savings only or more broadly on national savings.⁷ While most studies analyse the effect of tax-favoured retirement savings plans on households' savings or wealth (Engelhardt, 2000^[28]; Pence, 2002^[26]), some studies analyse the effect of these plans on households' consumption (Ayuso, Jimeno and Villanueva, 2007^[19]) and other studies look at the effect on both consumption and savings (Antón, Muñoz De Bustillo and Fernández-Macías, 2014^[14]; Attanasio, Banks and Wakefield, 2004^[25]). As explained before, an increase in private savings does not necessarily translate into an increase in national savings, in the case when individuals' contributions come from the higher disposable income allowed by the existence of the tax relief. Therefore, studies looking at the impact of tax incentives on consumption are more appropriate to conclude on the effect on national savings.⁸ In addition, looking at the impact of tax-favoured plans on different components of wealth can help our understanding of from which accounts households may reallocate their assets into tax-favoured ones.

Studies differ in their definition of household wealth and this may have implications for whether or not tax incentives may be found effective in raising savings. These definitions may be constrained by the data used. For example, Rossi (2009^[21]) only considers ordinary savings, i.e. amounts saved in a bank, building society, or Post Office account. In Poterba, Venti and Wise (1996^[16]) the wealth measure includes all financial assets. They argue that financial assets are the closest substitute for pension assets. Other studies consider that a broader definition of wealth should be used. For example, in Benjamin (2003^[18]) total wealth equals net financial assets, including IRA and 401(k) assets, plus housing equity plus the value of business, property, and motor vehicles. Including housing wealth is motivated by several considerations. First, private pensions and housing are both illiquid, tax-favoured assets that are often held for long periods. Second, there are many ways to substitute between private pensions and housing equity, for example, by not accelerating mortgage payments or by not buying a bigger house. Engelhardt (2000^[28]) has an even broader definition of wealth, which includes 401(k) assets, other pension assets, social security wealth, and financial and housing wealth. His view is that it is important to consider all assets that finance retirement consumption. In particular, individuals who are not eligible to join a 401(k) plan may have access to other types of pension plan (i.e. DB and non-401(k) DC plans). Not accounting for these assets in other pension plans may bias the estimated effect of tax incentives on household wealth.

Measurement errors in survey data can weaken the precision of estimates of the effect of tax incentives on household savings. Most studies use survey data to examine the effectiveness of tax incentives. These studies give access to rich information about households' demographic and socioeconomic characteristics, which are necessary to control for factors that may influence saving decisions. However, individuals may not give precise answers regarding their eligibility for private pension plans, their income and the amount of assets and wealth that they hold in various products. For example, by

comparing self- and firm-reported pension data, Engelhardt (2000_[28]) finds significant measurement error in 401(k) eligibility in the self-reported data, and the error varies with household income. Low-to-middle income households understate eligibility, while high-income households overstate eligibility. In addition, the measurement error is highly correlated with saving behaviour. This leads to an upward bias of the effect of 401(k) eligibility on savings. Combining survey data with administrative registers (to have accurate measures of income, wealth and pension plan characteristics) can reduce measurement errors and improve the precision of estimates.

Longitudinal studies are better suited than cross-sectional ones to assess the impact of tax incentives for retirement savings plans, as it is necessary to observe the same individual or household over long periods of time. These long-term and repeated observations allow the analysis of the correlation between savings and participation in tax-favoured plans. Repeated cross-sections are imperfect substitutes for panel studies as they do not guarantee that households surveyed in different years are similar on all their characteristics (observable and non-observable). The study by Chetty et al. (2014_[27]) is striking in this respect in the sense that the authors use administrative data (with a higher quality level and lower measurement error than self-reported information) for a large panel of individuals. They merge data from several administrative registers (the income tax register, the population register, and the Danish Integrated Database for Labour Market Research) to obtain annual information for the Danish population from 1995 to 2009. Their analysis relies on a panel of approximately 41 million observations for 4 million individuals and therefore leads to very robust results.

Finally, it may be difficult to generalise results when the effect is measured over a short period of time and/or for a specific population subgroup. For example, Attanasio and DeLeire (2002_[24]) examine the consumption and saving behaviour in the first nine months after a household starts making contributions to an IRA. If the change in behaviour happens after nine months, their model would miss it. In the same vein, Engelhardt and Kumar (2011_[31]) analyse the extent to which pension wealth crowds out non-pension wealth, but their sample is limited to older households from the Health and Retirement Study (i.e. individuals aged 51 to 61 year olds and their spouses). The authors acknowledge that their results may not fully characterize the saving response of younger workers to changes in pension wealth.

Low-income households are more likely to respond to tax incentives by increasing overall savings

The last group of studies analysed in this section distinguishes the effect of tax incentives by earnings level and shows that low-to-middle income earners are more likely to respond to tax incentives by increasing their overall savings, while high-income earners tend to reallocate their savings. All these empirical studies refer to *the United States*. They argue that, as low-income earners have little wealth, when they decide to contribute to a tax-favoured retirement savings plan, their contributions essentially represent new savings, as they have few other assets to reallocate. By contrast, high-income earners are more likely to finance contributions to tax-favoured accounts by shifting assets from other taxable accounts, rather than reducing their consumption.

Engelhardt (2000_[28]) shows that 401(k) eligibility significantly increases household savings for low-to-middle income households, but that the overall impact on savings is not significant. The author combines self-reported and firm-reported pension information in order to account for measurement errors in both types of data. He uses a broad

definition of household savings and uses detailed data on 401(k) pension plans, other pensions, Social Security, and private wealth from the 1992 Health and Retirement Study. The study shows that 401(k) eligibility significantly increases household savings for low-to-middle income households. This effect decreases with income and is not statistically different from zero for middle-to-upper income households. When all households are considered in aggregate, the study shows that 401(k) eligibility does not have a significant impact on household savings. In addition, as 401(k) eligibility does not seem to induce a substitution within financial assets and is inversely correlated with other pension assets, the results imply significant firm-level substitution of 401(k) for other pension assets.

Engen and Gale (2000^[29]) find that the impact of 401(k) eligibility on households' wealth varies significantly by earnings level. The authors use repeated cross-sections of the Survey of Income and Program Participation in 1987 and 1991. They compare the growth of households' wealth within six different earnings groups for eligible and ineligible households. On the one hand, they find that for groups with low earnings, the impact of 401(k) eligibility on savings is significant and as large as the increase in 401(k) balances for eligible households in this group, suggesting that they finance all of their 401(k) contributions by increasing their savings. On the other hand, 401(k) eligibility has no significant impact on wealth accumulation for groups with high earnings. Overall, because high-earnings groups hold most of 401(k) assets, the authors estimate that only between 0% and 30% of 401(k) balances represented net additions to private savings between 1987 and 1991.

Chernozhukov and Hansen (2004^[30]) examine the distributional effect of participation in 401(k) pension plans on wealth. Conditional on eligibility for a 401(k) plan, the authors determine the effect of 401(k) participation (defined as having a positive 401(k) balance) on net non-401(k) financial assets, net financial assets and total wealth. They use data from a sample of households from the 1991 Survey of Income and Program Participation and run a quantile regression which decomposes the effects for people in different deciles of the wealth distribution. They find that the effects of 401(k) participation on net financial assets and on total wealth are positive and significant over the entire range of the asset distribution, while the effect on non-401(k) financial assets is not significantly different from 0. For low-wealth households, the increase in net financial assets seems to translate entirely into an increase in total wealth. However, for high-wealth households, there is significant evidence of substitution from other (non-financial) forms of wealth, as the increase in total wealth due to 401(k) participation is much smaller than the increase in net financial assets.

Finally, Engelhardt and Kumar (2011^[31]) show that pension wealth raises total household wealth and that most of the reallocation effect is concentrated in higher-wealth households. The authors aim at identifying the extent to which an increase in pension wealth is associated with a decline in non-pension wealth (so-called "crowding-out" effect). Rather than focusing on the effect of one particular type of plan, such as 401(k) plans, the authors include all types of occupational pension plan plus social security pensions to determine the effect of pension wealth on non-pension wealth at different points in the non-pension wealth distribution.⁹ They use both detailed administrative datasets and survey information from the 1992 wave of the Health and Retirement Study to get accurate data on pensions and lifetime earnings for older workers. They find that each dollar of pension wealth is associated with a 53 to 67 cent decline in non-pension wealth, meaning that pension wealth also raises total household wealth. In addition, most of the crowding-out effect is concentrated in higher-wealth households, with a decline in

non-pension wealth of 30 to 75 cents per dollar of pension wealth. By contrast, the authors argue that policies targeted at increasing pension wealth for lower-wealth households will raise overall household wealth accumulation essentially dollar-for-dollar (no crowding-out effect).

To sum up, a reasonable estimate for the share of new savings in total retirement savings in tax-favoured plans would be between a quarter and a third. The studies presented earlier estimate that between 9% and 100% of retirement savings represent new savings. As suggested by Hubbard and Skinner (1996^[15]), the actual impact of tax incentives probably lies between those two extremes. Low-to-middle income earners are more likely to respond to tax incentives by increasing their overall savings, but they hold disproportionately less of private pension assets. By contrast, high-income earners hold a large share of total private pension assets but tend to reallocate their savings. The overall share of new savings is therefore likely to be well under 50%. Following Ayuso, Jimeno and Villanueva (2007^[19]), Benjamin (2003^[18]), Engelhardt and Kumar (2011^[31]), Engen and Gale (2000^[29]) and Hubbard and Skinner (1996^[15]), a reasonable estimate could be that new savings represent between a quarter and a third of retirement savings in tax-favoured plans.

4.4. The impact of non-tax incentives on participation, contributions and savings

Policy makers are also using non-tax financial incentives to promote savings for retirement. As presented previously, low-income earners are less likely to save in private pension plans, but when they do, they usually increase overall savings. In addition, low-income earners may lack understanding around tax relief and tend to neglect tax incentives. Research indeed shows that understanding around the tax treatment of pensions is low (Sandler, 2002^[38]; Clery, Humphrey and Bourne, 2010^[39]) and that, for lower income groups, tax relief is not an important determinant in households' decision to save (Kempson, McKay and Collard, 2003^[40]). Policy makers have therefore tried other types of financial incentive to encourage low-to-middle income earners to save for retirement. Recent initiatives used to promote retirement savings include matching contributions and fixed nominal subsidies.

This section presents empirical evidence on the effect of non-tax financial incentives on participation in and contributions to retirement savings plans. Studies looking at the impact on national savings are also included when available.

Impact of matching contributions on participation in and contributions to retirement savings plans

Evidence gathered from the United States and Australia suggests that matching contributions increase participation in retirement savings plans. When combined with automatic enrolment, the additional effect of an employer match is modest. The evidence is mixed regarding the impact of matching on total contributions. None of the studies reviewed assess the impact of matching contributions on national savings.

Empirical evidence from a large body of the literature in *the United States* suggests that employer matching contributions increase participation in occupational pension plans. Choi (2015^[41]) and Madrian (2013^[42]) review the rich literature in the United States regarding the effect of matching contributions on participation in and contributions to private pension plans. Both conclude that the presence of a matching contribution increases participation and that the higher the match rate, the higher the impact on

participation. As occupational pension plans already benefit from a favourable tax treatment (“EET”), employer matching contributions improve on the effect of tax incentives on pension plan participation.

Madrian (2013^[42]) however qualifies the link between the match rate and the participation rate as modest. This statement relies on a study by Engelhardt and Kumar (2007^[43]). Using a nationally representative random sample of individuals aged 51 to 61 and their spouses from the Health and Retirement Survey, they find that increasing the match rate by 25 percentage points (for example, from 25 cents per dollar of employee contribution to 50 cents) raises 401(k) participation by 5 percentage points. Choi (2015^[41]) reports that an increase of 10 percentage points in the match rate increases the participation rate in a range from 2.5 percentage points to 6.3 percentage points, depending on the study.

By contrast, evidence in *Australia* suggests that low-to-middle income earners may be sensitive to the match rate and maximum entitlement. The government encourages low-to-middle income earners to make voluntary savings through the super co-contribution programme.¹⁰ In July 2012, the government reduced by half both the match rate (to 50%) and the maximum entitlement (to AUD 500).¹¹ Between 2011-12 and 2012-13 the number of beneficiaries dropped by 40% and the payments dropped by 60%. Clearly, many people felt that the incentive was not high enough to continue making voluntary contributions to the superannuation system.¹²

Beshears et al. (2007^[44]) look at the impact of matching contributions on participation in the context of automatic enrolment and find a limited effect. Many companies in the United States combine both automatic enrolment and employer matching contributions. The authors analyse the additional effect of an employer matching contribution on participation in automatic enrolment plans. A priori, the effect is not obvious. On the one hand, the opt-out rate could be much higher without a match, since the incentives to participate are reduced. On the other hand, if employee inertia drives the automatic enrolment participation effect, high participation rates would still be expected even without a matching contribution. The authors use the variation in the employer match structure and generosity within and across nine firms with automatic enrolment between 2002 and 2005 to assess the effect of the maximum employer match on plan participation. They find that a decrease in the maximum employer match by 1% of pay reduces the plan participation rate at six months of eligibility by 1.8 to 3.8 percentage points. Therefore, the success of automatic enrolment at increasing participation in occupational pension plans does not appear to rely much on having an employer match.

The impact of matching on total contributions to retirement savings plans is not clear. Choi (2015^[41]) and Madrian (2013^[42]) both show that the empirical evidence in the United States is mixed. Some studies find a positive relationship between the match rate and contribution levels, others find no relationship and yet other studies find a negative relationship.

Choi et al. (2002^[45]) show, however, that the rate of employee contribution up to which the employer offers the match (i.e. the match threshold) has an impact on employee contributions. They 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%.

In addition, in Australia, government matching contributions may be effective at raising contribution rates for low-income earners. OECD (2012^[46]) shows that, despite the co-contribution programme, low-income earners are less likely to make voluntary contributions to the superannuation system than other income groups. However, those who do contribute voluntarily tend to have much higher contribution rates than other income groups, as they need to make a larger contribution effort to get the maximum entitlement.

Impact of fixed nominal subsidies on participation and on national savings

Fixed nominal subsidies paid by the government into pension accounts can be found in Chile (bonus per child), Germany (Riester plans), Lithuania (second pillar pensions), Mexico (social quota) and Turkey (automatic enrolment scheme).¹³ They are designed to attract low-income individuals, as the subsidy represents a higher share of their income.

Evidence related to the introduction of the Riester pension scheme in **Germany** shows that subsidies are effective in attracting families with children and low-income earners.¹⁴ Indeed, despite the fact that participation rates of Riester pensions increase with income, Riester pensions are more equally distributed by income than occupational pensions and unsubsidised private pension plans. The different studies also suggest that Riester pensions have a positive impact on overall savings, although the evidence is mixed for low-income earners.

Börsch-Supan, Coppola and Reil-Held (2012^[47]) show that Riester pensions achieve higher coverage rates among low-income households than other private pension plans. Using data from the SAVE survey between 2001 and 2010, the authors show that the proportion of households holding any type of private pension plans (Riester plans, occupational plans and other private pension plans) increases with disposable household income. In 2009, only around 19% of households in the lowest income bracket had taken up Riester pension plans, while almost a half of those in the two upper income brackets participated in the scheme. However, the distribution of participation is even more skewed towards high-income earners for occupational pension plans and other private pension plans, which cover only around 5% of households in the lowest income bracket. Therefore, among low-income households, Riester pensions are much more common than any other form of private pension provision. As a result, Riester pensions are more equally distributed by income than occupational pensions or unsubsidised private pension schemes. In addition, in contrast with occupational pensions, the uptake of Riester plans has been quite dynamic for all income groups between 2003 and 2010, including in the bottom income quintile. The authors therefore conclude that the Riester scheme has not completely failed in attracting low-income earners.

Börsch-Supan, Coppola and Reil-Held (2012^[47]) also find no evidence that Riester pensions have reduced savings in other savings vehicles. Using individuals' declaration about changes in their saving behaviour analysed by Coppola and Reil-Held (2010^[48]), they show that only a minority of households say that they saved less in total since starting to be enrolled in a Riester pension plan, while most households respond that they have saved more. This trend holds across all income groups. In addition, at a macro level, the increase of participation in Riester pensions was not accompanied by a decline in participation in other types of private pension plans.

The other studies described below do not measure participation in Riester pensions but look at the impact of the introduction of Riester plans on households' savings, in particular for low-income households. Their results suggest that low-income households

reallocate existing savings from non-subsidised contracts to subsidised savings contracts, somehow contradicting individuals' declarations as reported in Coppola and Reil-Held (2010_[48]). However, this may be because very low earners only need to contribute EUR 60 to get the full subsidy. This amount would be easy to reallocate from other savings accounts.

Corneo, Keese and Schröder (2008_[49]) argue that the introduction of the Riester pension scheme had no impact on the probability to save or on the saving rate of low-income households. The authors use data from the German Socio-Economic Panel between 2000 and 2006 to assess the impact of the Riester scheme on households' saving propensities. They use income to distinguish between people with different incentives to save in a Riester plan, as they do not observe which individuals actually participate in a Riester plan in each year in the data. They calculate the "subsidy ratio" as the public subsidy (in the form of fixed nominal subsidies or tax deductions) divided by the total savings amount for additional old-age provision. They observe that the subsidy ratio is the lowest for middle-income households, as the fixed nominal subsidies represent a larger share of income for low-income households, while high-income households benefit from tax deductions. Therefore, the authors compare the probability to save and the saving rates before and after the introduction of Riester plans for low-income households (with high subsidy ratio) and middle-income households (with low subsidy ratio). The findings suggest that the probability to save and the saving rates of low-income households did not increase more after the introduction of the Riester scheme despite them having higher incentives to save in such a plan. The authors therefore conclude that, rather than generating new savings, Riester plans seem to induce people to reallocate existing savings from non-subsidised contracts to subsidised savings contracts.

Using the same database, Kolerus, Koske and Hüfner (2012_[50]) find that the introduction of the Riester pension scheme in 2002 was associated with a general increase in the household savings rate, except for low-income households, thus confirming the findings of Corneo, Keese and Schröder (2008_[49]). The authors analyse the driving factors of changes in the German household savings rate over the period 1991 to 2008 and in particular the impact of the introduction of the Riester scheme in 2002 on households' savings rate. They find that the introduction of the Riester pension scheme in 2002 had a positive effect on the household savings rate, both for households that signed up for a Riester plan and for those that did not (suggesting that the intensive debate about the importance of private retirement savings that was triggered by the reform also had an impact). However, the interaction term between being a low-income household and having a Riester plan is significant and negative, suggesting that low-income households do not save more after signing up for a Riester plan but rather reduce other forms of savings in exchange for subsidised savings under the Riester scheme.

Pfarr and Schneider (2013_[51]) concur with the two previous studies that low-income earners do not increase their old-age provision because of the Riester scheme. They find however a positive effect of the child subsidy on participation. Using panel data from the SAVE survey between 2005 and 2009, the authors examine simultaneously the determinants of participation in Riester plans and in private pension insurance. They find that the decisions to participate in a Riester plan and in private pension insurance are related. The impact of the number of children is positive and significant on Riester participation, while it is insignificant or even negative on private pension insurance participation. This shows that child subsidies have an impact on the take up of Riester plans. However, low-income earners are less likely to participate in a Riester plan and in private pension insurance, suggesting that the incentives in the Riester scheme are not leading to higher old-age

provisions for the low-income earners. In addition, alternative investments (building loan contracts, cash-value life insurance contracts, accumulation plans, stocks and investment bonds) positively affect the uptake of both forms of provisions, suggesting that individuals use various forms of assets to make provisions for old age.

Finally, it is interesting to note that the design of the subsidies does not encourage individuals to contribute above the 4% threshold. OECD (2012^[46]) shows that average contribution rates are similar across all income groups, around the 4% minimum required by legislation to obtain the full subsidy. This threshold may act as an anchor in people's mind and does not provide any incentive to go beyond it.

Impact of a mix of policies on national savings

KiwiSaver is a voluntary retirement savings scheme introduced in 2007 in *New Zealand* with the aim of increasing the retirement wealth of the population. It offers an interesting case study as it uses automatic enrolment and offers both matching contributions and fixed nominal subsidies (up to 2015). Its launch was also accompanied by effective communication and education campaigns (OECD, 2014^[52]). In terms of participation, KiwiSaver is a real success with over 2.6 million people enrolled as at June 2016. In addition, KiwiSaver members' distribution by income is similar to the one of the eligible population, meaning that low-income earners are not disproportionately left out of the scheme (Inland Revenue, 2015^[53]).

Two studies assess the impact of the KiwiSaver scheme on national savings and find little to no effect. However, they only cover the first 3.5 years of the scheme, which may not be sufficient to reach any final conclusion. The two papers assess the KiwiSaver scheme as a whole and do not disaggregate the effect by policy. Non-tax incentives are however an important factor as most members of the scheme to date have joined the plan voluntarily, not through automatic enrolment.

Law, Meehan and Scobie (2011^[54]) assess individuals' saving behaviour after the introduction of the KiwiSaver scheme and find little to no effect on national savings. The authors use a national survey conducted in 2010 that asked respondents how the contributions they were making at the time to KiwiSaver would have been used in the absence of the scheme. On average, KiwiSaver members reported that they would have used 64% of the money to save in other vehicles or to reduce their debt had they not joined KiwiSaver. In other words, only 36% of their KiwiSaver contributions represent additional savings over and above those that would have been made anyway. This share is reduced to 29% after accounting for the fact that high-income earners contribute a disproportionate share of total savings. This share of new private savings may not be enough to offset the state contributions (through borrowing), such that, in the long run, KiwiSaver's effect on national saving is found to be negligible.

The analysis in Law and Scobie (2014^[55]) provides consistent results. The authors use linked data from the Survey of Family, Income and Employment and from Inland Revenue Department administrative data on KiwiSaver membership, covering the period 2002 to 2010. They analyse the extent to which membership of KiwiSaver is associated with greater accumulations of net wealth. Their results show that KiwiSaver membership has no significant positive effect on net wealth accumulation, suggesting that KiwiSaver contributions come primarily from a reallocation of other savings.

There is an important caveat for the two previous papers though, as they assess the impact of KiwiSaver up to 2010. This means that the analysis only considers the first 3.5 years of

the scheme. In addition, the impact of the global financial crisis was still large in 2010. As the analysis in Law and Scobie (2014^[55]) does not distinguish the changes in net wealth due to financial asset price movements from those due to individuals modifying their saving behaviour, the New Zealand Institute of Economic Research (2015^[56]) argues that the above results should not be generalised to the future.

4.5. Conclusions

This document has reviewed the literature on the impact of tax and non-tax financial incentives on retirement savings across several OECD countries.

Tax incentives for retirement savings come from a differential tax treatment as compared to other savings vehicles and can take the form of tax exemptions, tax deductions, tax credits and tax rate reliefs. Tax incentives are effective tools to promote savings for retirement, in particular:

- Allowing individuals to deduct pension contributions from taxable income encourages participation in and contributions to 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 they may lack sufficient resources to afford contributions, they may not have enough tax liability to fully enjoy tax reliefs, and they are more likely to have a low level of understanding of tax-related issues.
- There is a debate on whether tax incentives for retirement savings plans increase retirement savings as a result of people actually increasing their overall savings (new savings) or as a result of people reallocating savings. Studies estimate that between 9% and 100% of retirement savings represent new savings. The empirical measurement of whether tax incentives for retirement savings lead to an increase in national savings is inconclusive because of a number of constraints and methodological issues. A reasonable estimate would be that new savings represent between a quarter and a third of retirement savings in tax-favoured plans.
- Low-to-middle income individuals are more likely to respond to tax incentives by increasing their overall savings, while high-income individuals tend to reallocate their savings.

Non-tax financial incentives have proved effective in raising retirement savings too, especially:

- The presence of a matching contribution increases participation in retirement savings plans and the higher the match rate, the higher the impact on participation. In particular, employer matching contributions improve on the effect of tax incentives on occupational pension plan participation. When combined with automatic enrolment, the additional effect of an employer match on participation is modest. The impact of matching contributions on contribution levels is less clear.
- Fixed nominal subsidies have proved successful in Germany at encouraging families with children and low-income households to participate in the Riester pension scheme. Riester pensions have a positive impact on overall savings, although the evidence is mixed for low-income individuals.
- KiwiSaver is a success in terms of participation and reaching all income groups equally, however the impact on national savings may be limited.

Notes

¹ EconLit is a major source of references to economic literature worldwide. The database contains more than 1.1 million records from 1886 to present. EconLit covers virtually every economics related area.

² See Chapter 1 for a further description of the different policy objectives.

³ The French personal income tax system has four tax thresholds. The authors test the impact of the three highest thresholds on contribution levels.

⁴ In 2015, about 90% of tax filers who received the Saver's Credit had contributed to an occupational pension plan. Being a member of an occupational plan is therefore an important factor explaining the take-up of the Saver's Credit.

⁵ Only individuals whose employer establishes a 401(k) plan are eligible to contribute to such a plan.

⁶ Before 1999, contributions to both accounts were fully tax deductible, with income in the top tax bracket taxed at 59% and income in the next tax bracket at 45%. Starting in 1999, the deduction for capital pension contributions for individuals in the top income tax bracket was reduced from 59 cents to 45 cents per krone of contribution.

⁷ In addition, one of the main variables influencing saving decisions, income, is highly correlated with dependent variables, potentially affecting the precision of the estimates.

⁸ Benjamin (2003^[18]) examines the impact of 401(k) eligibility on household wealth, but adjusts for the fact that 401(k) and IRA assets are pre-tax balances in order to drive conclusions for both private and national savings.

⁹ Surprisingly, non-pension household wealth includes IRAs. It is defined as the sum of cash, checking and saving accounts, certificates of deposit, IRAs, stocks, bonds, owner-occupied housing, business, other real estate, vehicle net equity, and other assets less other debts.

¹⁰ The eligibility criteria to get a super co-contribution are: making a voluntary pension contribution; being younger than 71; having a total income lower than the higher income threshold; having at least 10% of total income coming from employment-related activities; having a total superannuation balance below the transfer balance cap; and not having contributed above the non-concessional contributions cap.

¹¹ Every dollar that the individual earns above the lower income threshold reduces the maximum entitlement by 3.333 cents.

¹² Part of the drop in the number of beneficiaries may also be driven by the decrease in the maximum entitlement, with more people being income-tested out, while part of the decrease in payments may be due to the lower match rate.

¹³ In New Zealand, the kick start payment has been removed for KiwiSaver contracts opened after 21 May 2015.

¹⁴ There are three types of subsidy in Riester: a basic subsidy of EUR 175 per year and per person, a child subsidy of EUR 300 per year and per child, and a young worker subsidy of EUR 200 granted once at the age of 25. In order to receive the maximum subsidy, the sum of the member's contributions and subsidies must be at least equal to 4% of previous year's annual income. Only very low-income households can get the full subsidy without investing 4% of their income if they contribute at least EUR 60 annually.

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Chapter 5. The long-term fiscal cost of financial incentives to promote savings for retirement

This chapter provides an assessment of the cost of promoting savings for retirement via tax and non-tax financial incentives from the point of view of fiscal policy and the budget. It first defines the concept of tax expenditure and presents how countries report the cost related to financial incentives for retirement savings. It then introduces a measure that allows for cross-country comparisons and calculates that measure for a selection of countries.

Financial incentives to promote savings for retirement represent a cost for governments. Tax incentives translate into lower personal income taxes paid by individuals and thus create a fiscal cost for the government. By contrast, non-tax financial incentives come directly from the general budget. The total cost of those tax and non-tax incentives depends on the generosity of the incentives and the amount contributed into retirement savings plans in each year. In an era of budget stringency, this type of cost has come under scrutiny.

This chapter provides an assessment of the cost of promoting savings for retirement via tax and non-tax financial incentives from the point of view of fiscal policy and the budget. Its main objective is to examine the fiscal cost of tax and non-tax financial incentives for retirement savings plans and its evolution over the next 45 years in selected OECD countries. This chapter first looks at national tax expenditure reports, focusing on the tax expenditures related to private pensions. After identifying the limitations of the measures used in these tax expenditure reports, this chapter estimates the current and future profile of the net tax expenditure related to private pensions in Australia, Canada, Chile, Denmark, Iceland, Latvia, Mexico, New Zealand, the Slovak Republic and the United States. The net tax expenditure in a given year is measured as the net amount of personal income tax revenues forgone on contributions, revenues forgone on accrued income and revenues collected on withdrawals that arise when comparing with the tax treatment of traditional savings accounts (“Taxed-Taxed-Exempt” or “TTE” tax regime benchmark). It adds to direct spending associated with non-tax incentives, when relevant, in order to estimate a total fiscal cost.

The analysis shows that the total fiscal cost of financial incentives varies greatly across countries, but remains in the low single digits of GDP. The time profile of the fiscal cost depends on the level of maturity of the pension systems and the countries’ age profile. In some countries, direct spending in the form of matching contributions or fixed nominal subsidies represents an important component of the total fiscal cost related to the promotion of savings for retirement. Accounting for corporate income tax revenues and the potential effects of new savings would reduce the cost of financial incentives.

The chapter proceeds as follows. Section 5.1 defines the concept of tax expenditure and provides the tax expenditures related to private pensions and their distribution by income for selected countries, as reported nationally. Considering the limited comparability of the measures used in tax expenditure reports across countries, this chapter looks at an additional indicator, the net tax expenditure, which is comparable across countries and measures the current and future cost of tax incentives for private pension plans. Before calculating the indicator for selected countries, Section 5.2 explores the relationship between the net tax expenditure and different economic variables, the maturing of pension systems, and demographic trends. Section 5.3 provides the results of estimating the net tax expenditure between 2015 and 2060 for selected OECD countries. Direct spending associated with government non-tax incentives is added to estimate a total fiscal cost. Section 5.4 discusses the potential impact of incorporating corporate income tax and new savings effects into the calculation of the net tax expenditure. Section 5.5 concludes. Annex 5.A presents the approach used to project the future profile of the cost of tax incentives for retirement savings, as well as country-specific assumptions used in the calculations.

5.1. Tax expenditures: Definitions, country reporting and limitations to comparability

Definition and calculation methods

The budgetary cost of a particular tax policy measure is generally referred to in the literature as a “tax expenditure”. A tax expenditure can be seen as a public expenditure carried out through the tax system via a special tax concession that results in reduced tax liability for certain subsets of taxpayers. In practice, tax expenditures are defined as “deviations from a tax norm or a benchmark that result in a reduced tax liability for the beneficiaries, who are generally a particular group of taxpayers or an economic activity” (OECD, 2010^[1]). According to OECD (1996^[2]), tax expenditures may take a number of different forms: exemptions (income excluded from the tax base), allowances (amounts deducted from gross income to arrive at taxable income), credits (amounts deducted from tax liability), rate relief (a reduced rate of tax applied to a class of taxpayers or activities) and tax deferrals (a relief which takes the form of a delay in paying tax).

The main challenge in any analysis of tax expenditures is to identify the benchmark tax system against which to establish the nature and extent of any tax concession (OECD, 2010^[1]). In general, the benchmark tax system is the regular tax arrangements that apply to similar classes of taxpayers or types of activity within countries. This may involve an element of judgment on what the regular tax arrangements are. Benchmarks may therefore vary across countries and also within countries over time.

There are three principal methods for estimating tax expenditures. First, the revenue forgone method measures the amount by which tax revenues are reduced by a particular tax concession, under the assumption of unchanged behaviour from the taxpayer.¹ Second, the outlay equivalent method measures the cost of providing the same monetary benefit through direct spending, assuming also that behaviour is unchanged as a result of the tax concession. Third, in contrast with the previous two methods, the revenue gain method takes potential behavioural responses into account and provides an ex ante measure of the expected increase in revenues if the concessions were repealed.

For each method, the cash-flow or present-value approaches can be used in the calculation. The cash-flow approach estimates the effect on government cash flow in a given year. The present-value approach estimates the effect on the tax liability accruing to government in a particular period. The cash-flow approach allows assessing the evolution over time of government revenue cash flows.

Country reporting of the cost related to financial incentives to promote savings for retirement

Tax expenditure reporting began in Germany and the United States in the late 1960s, with other countries introducing it in the late 1970s or later. In some countries, the authorities are legally obliged to produce a tax expenditure report (e.g. Austria, Belgium, France, Germany and the United States). The reports usually cover tax expenditures in the personal income tax as well as the corporate income tax. However, the actual definition and practice for estimating tax expenditures vary across countries, in particular for the choice of a tax benchmark. In the case of tax-favoured private pension plans, traditional savings accounts represent natural benchmarks. These usually follow a “TTE” tax regime. However, some countries have several types of savings account with different tax treatments, so the identification of the benchmark is not always straightforward.

Table 5.1 provides tax expenditures related to the tax treatment of private pension plans in selected OECD countries for 2017 or the latest year with available information. For most countries, the information comes from official tax expenditure reports published on the relevant authorities' websites. Table 5.1 shows that the number of items included in the reports related to the tax treatment of private pension plans varies greatly across countries. The significance of the tax expenditure items as a percentage of GDP varies from negligible (e.g. Mexico and the Slovak Republic) to around 1% of GDP (e.g. Australia, Canada, the United Kingdom).

Table 5.1. Reporting of tax expenditures related to the tax treatment of private pension plans in selected OECD countries

Country	Source	Item	Millions of national currency	% of GDP	Year	Tax benchmark	Methodology
Australia	Tax Expenditure Statement 2017	Concessional taxation of capital gains for superannuation funds	1 350	0.07	2017-18	TTE	Revenue forgone; cash-flow
		Concessional taxation of employer superannuation contributions	16 900	0.91			
		Concessional taxation of personal superannuation contributions	750	0.04			
		Concessional taxation of superannuation entity earnings	19 250	1.04			
		Concessional taxation of unfunded superannuation	590	0.03			
		Deductibility of life and total permanent disability insurance premiums provided inside of superannuation	2 370	0.13			
		Small business capital gains retirement exemption	550	0.03			
		Superannuation measures for low-income earners (1)	210	0.01			
		Tax on funded superannuation income streams	-320	-0.02			
		Tax on funded superannuation lump sums	-530	-0.03			
		Exemption for small business assets held for more than 15 years	320	0.02			
		Concessional taxation of superannuation entity earnings	18 300	0.99	2017-18	TTE	Revenue gain; cash-flow
		Concessional taxation of employer superannuation contributions	16 300	0.88			
Austria	Subsidy Report 2016	State-sponsored retirement provision plans (2)	5	0.00	2016	No subsidy	Direct spending
Belgium	Inventory of federal fiscal expenditures 2016	Pension savings	534.34	0.13	2015	No tax credit	Revenue forgone; cash-flow
		Individual contributions to group life insurance and pension funds	104.95	0.03			
Canada	Report on Federal Tax Expenditures 2018	Registered Pension Plans (RPP) - Deduction for contributions	15 915	0.74	2017 (p)	TTE	Revenue forgone; cash-flow
		RPP - Non-taxation of investment income	22 845	1.06			
		RPP - Taxation of withdrawals	-11 285	-0.53			
		RPP - Total	27 475	1.28			
		Registered Retirement Savings Plans (RRSP) - Deduction for contributions	8 605	0.40			
		RRSP - Non-taxation of investment income	15 010	0.70			
		RRSP - Taxation of withdrawals	-6 800	-0.32			
		RRSP - Total	16 815	0.78			

Country	Source	Item	Millions of national currency	% of GDP	Year	Tax benchmark	Methodology
France	Tax Expenditures 2018	Deduction of contributions to RMC	37	0.00	2017	No deduction	Revenue forgone; cash-flow
		10% tax deduction on pension benefits	4 060	0.18		No deduction	
		Tax exemption or reduced taxation of returns for bonds, funded arrangements and life insurance contracts	1 475	0.06		Taxed as income	
		Tax exemption of investment income in PERP	184	0.01		Taxed as income	
		Deduction of contributions for individual and voluntary savings (PERP and equivalent)	725	0.03		No deduction	
		Deduction of voluntary complementary pension contributions for self-employed	1 530	0.07		No deduction	
Germany	26 th Subsidy Report of the Federal Government	Support for private pensions through subsidies (subsidy amount) (3)	970	0.03	2017	No deduction; no subsidy	Revenue forgone; cash-flow + Direct spending
Ireland	Costs of Tax Expenditures	Employees' contributions to approved superannuation schemes	580.6	0.22	2015	TTE	Revenue forgone; cash-flow
		Employers' contributions to approved superannuation schemes	147	0.06	2015		
		Exemption of investment income and gains of approved superannuation funds	865	0.48	2013		
		Tax relief on "tax free" lump sums	134	0.07	2013		
		Pension contribution (Retirement Annuity and PRSA)	215	0.08	2015		
Italy	Final report from the working group on tax erosion, 2011	Deduction for contributions paid to supplementary pension funds pursuant to Legislative Decree 252 of 2005 and other supplementary pension schemes established in the European Union member states and in the states participating in the agreement on the European Economic Area	456	0.03	2009	No deduction	Revenue forgone; cash-flow
		Deduction for contributions paid to supplementary pension funds pursuant to Legislative Decree 252 of 2005 in the interests of dependents	11	0.00			
Mexico	Tax Expenditure Budget 2018	Deduction of contributions in special savings for retirement accounts, as well as premiums for pension insurance contracts and shares of investment companies, up to MXN 152 000 per year	1 941	0.01	2018	No deduction	Revenue forgone; cash-flow
		Deductions of complementary retirement contributions, contributions to personal pension plans, voluntary contributions	655	0.00			
New Zealand	2018 Tax Expenditure Statement	KiwiSaver tax credit (4)	743	0.26	2016-17	No spending	Direct spending
Slovak Republic	Tax register	Pillar II: Additional employee voluntary contributions	0	0.00	2015	No deduction	Revenue forgone; cash-flow
		Pillar III: Contributions of employees are tax-deductible up to 180 euro per year	1	0.00			

Country	Source	Item	Millions of national currency	% of GDP	Year	Tax benchmark	Methodology
Sweden	Recognition of Tax Expenditures in 2018	Reduced tax on returns of pension funds	2 330	0.05	2017	Full tax	Revenue forgone; cash-flow
Switzerland	Federal Department of Finance, 2011	Tax deduction of employer and employee contributions to pillar 2	3 500	0.61	2007	TTE	Revenue forgone; cash-flow
		Tax exemption of employer contributions into pillar 2 for redemption	165	0.03			
		Tax exemption of return on investment into pillar 2	1 450	0.25			
		Taxation of annuities from pillar 2	-1 500	-0.26			
		Taxation of income from pillar 2 (lower tax rate for lump sums)	-160	-0.03			
		Tax deduction of contributions into pillar 3a	830	0.14			
		Tax exemption of return on investment into pillar 3a	50	0.01			
United Kingdom	Registered pension schemes: cost of tax relief	Income tax relief on occupational scheme contributions by employees	4 600	0.23	2016-17	TTE	Revenue forgone; cash-flow
		Income tax relief on occupational scheme contributions by employers	18 000	0.88			
		Income tax relief on personal pension scheme contributions by employees	2 400	0.12			
		Income tax relief on personal pension scheme contributions by employers	5 100	0.25			
		Contribution to personal pensions and retirement annuity contracts by self employed	700	0.03			
		Investment income of pension funds	7 900	0.39			
		Pension payments	-13 500	-0.66			
		Total	25 200	1.24			
United States (5)	Analytical perspectives - Budget of the US Government - FY 2018	Net exclusion of pension contributions and earnings - DB employer plans	70 400	0.38	2016	TTE	Revenue forgone; cash-flow
		Net exclusion of pension contributions and earnings - DC employer plans	61 770	0.33			
		Net exclusion of pension contributions and earnings - Individual Retirement Accounts	16 410	0.09			
		Net exclusion of pension contributions and earnings - Low and moderate income savers credit	1 270	0.01			
		Net exclusion of pension contributions and earnings - Self-Employed plans	28 050	0.15			
		Defined benefit employer plans	30 510	0.16			
		Defined contribution employer plans	72 100	0.39	2016	TTE	Revenue forgone; present-value
		Exclusion of IRA contributions and earnings	1 390	0.01			
		Exclusion of Roth earnings and distributions	4 540	0.02			
		Exclusion of non-deductible IRA earnings	450	0.00			
		Exclusion of contributions and earnings for Self-Employed plans	5 120	0.03			

Country	Source	Item	Millions of national currency	% of GDP	Year	Tax benchmark	Methodology
United States (5)	Estimates of Federal Tax Expenditures for Fiscal Years 2017-2021	Credit for certain individuals for elective deferrals and IRA contributions	1 400	0.01	2017	TTE	Revenue forgone; cash-flow
		Net exclusion of pension contributions and earnings: Plans covering partners and sole proprietors (sometimes referred to as "Keogh plans")	7 700	0.04			
		Net exclusion of pension contributions and earnings - Defined benefit plans	77 400	0.40			
		Net exclusion of pension contributions and earnings - Defined contribution plans	117 000	0.60			
		Individual retirement arrangements – Traditional IRAs	18 000	0.09			
		Individual retirement arrangements - Roth IRAs	7 500	0.04			

Note: "TTE" means a comprehensive income tax benchmark, in which contributions are funded from after-tax income, investment income is taxed as income and benefits are tax free. "p" means projection.

1. The Superannuation Co-contribution and the Low Income Superannuation Tax Offset are government payments that increase the retirement savings of eligible low-income taxpayers. The payments are expenses payments and are not included in the Tax Expenditure Statement. The amounts indicated represent the impact of these payments not being taxed. In addition, a tax offset is available for post-tax contributions to the superannuation account of a low-income spouse.

2. For contributions to certain pension funds, income tax is reimbursed (i.e. tax credit) in the form of a state matching contribution paid in the pension account.

3. This item includes the deduction of contributions up to EUR 2 100 and the direct subsidies.

4. The KiwiSaver tax credit reflects the combined expenditure on Member Tax Credit and interest payments made by Inland Revenue relating to the period when contributions to members' scheme providers are held by Inland Revenue.

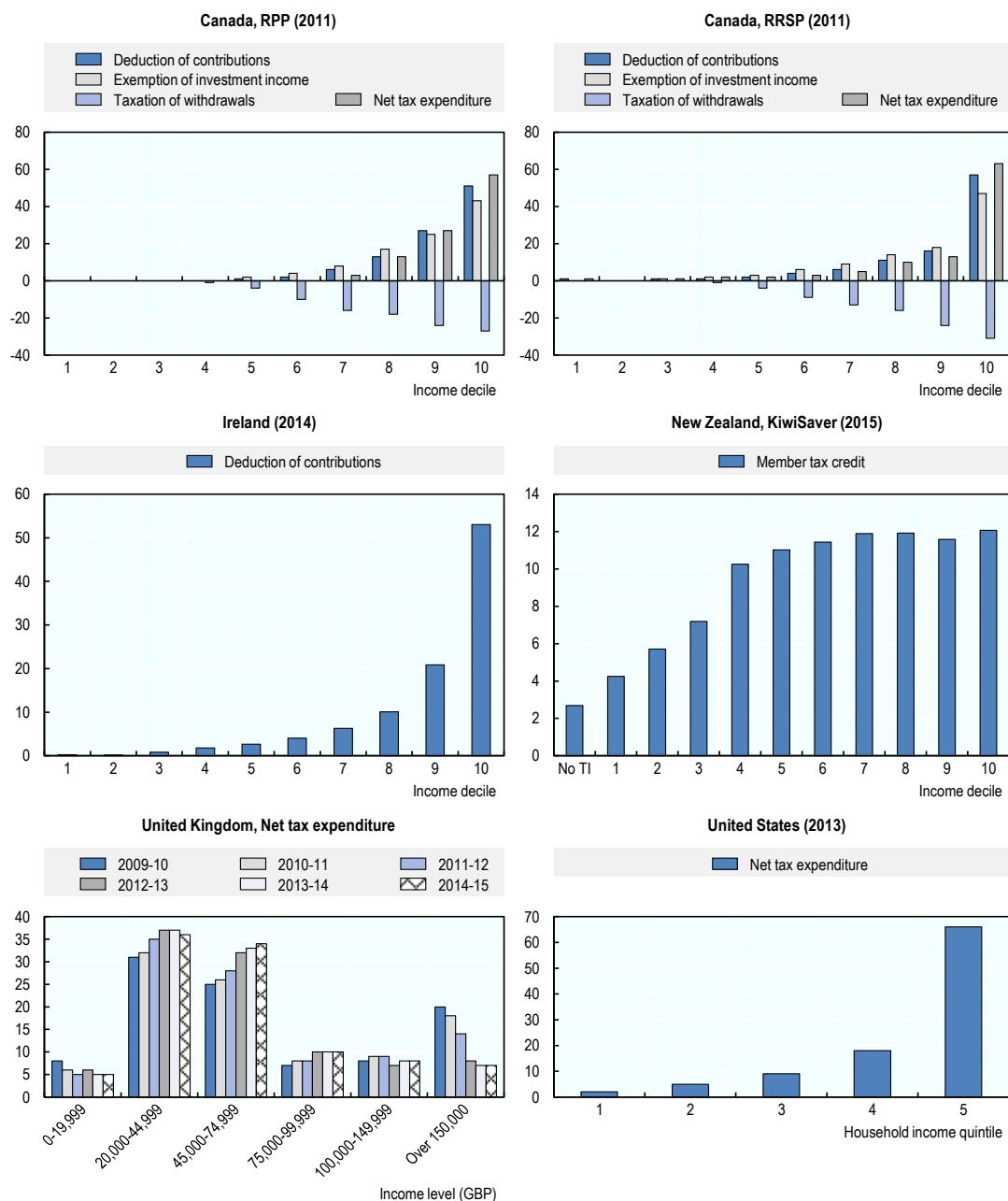
5. There are two main tax expenditure reports in the United States, prepared respectively by the Office of Management and Budget (U.S. Treasury) and the Joint Committee on Taxation. Joint Committee on Taxation (2018₍₃₎) lists some of the differences between the two reports.

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Some countries also report the distribution of tax expenditure across income groups. These tend to show that the tax expenditures are concentrated within high-income households. As shown in Figure 5.1, individuals in the top 20-25% of the income distribution receive around 80% of the tax expenditure related to retirement savings in Canada, 71% in Ireland and 66% in the United States.² In voluntary pension systems, high-income earners are more likely to participate in private pension plans than other income groups, reflecting their higher propensity and capacity to save. Moreover, their higher income results in a greater value of the tax relief per household, even when the tax rate is same rate for everyone. Finally, in progressive tax systems where tax rates increase with taxable income, high-income earners typically face the highest marginal tax rates, thereby benefiting more on every unit of the flows that attract tax relief.

Figure 5.1. Distribution by income of tax expenditures and direct government spending related to private pensions

As a percentage of the total tax expenditures / spending related to private pensions



Note: “No TI” means no taxable income in the case of New Zealand. The distributions are on an individual basis, except for the United States (household basis).

Source: Macdonald (2016^[4]) for Canada, Collins and Hughes (2017^[5]) for Ireland, Inland Revenue data for New Zealand, Pensions Policy Institute (2016^[6]) for the United Kingdom, and Congressional Budget Office (2013^[7]) for the United States.

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In the United Kingdom, 70% of tax expenditures related to the tax treatment of private pensions goes to individuals earning between GBP 20 000 and GBP 75 000 and the part received by very high-income earners has declined over the period 2009-10 to 2014-15. The share of the tax expenditures paid to individuals earning above GBP 150 000 has declined from 20% to 7% over the period. This is due to the recent reforms that limited tax relief on pensions and affected more high-income individuals. Indeed, the maximum amount of pension contributions that an individual can get tax relief on in each tax year (the annual allowance) has been reduced from GBP 255 000 in 2010-11, to GBP 50 000 between 2011-12 and 2013-14, and is now GBP 40 000 since 2014-15. The lifetime allowance also limits the total amount that individuals can accumulate in a private pension plan. It was introduced in 2006-07 at a level of GBP 1.5 million. It then increased each year to 2010-11, when it reached a level of GBP 1.8 million. Since 2012-13, the lifetime allowance has been reduced and its level since April 2018 is GBP 1.03 million.

The KiwiSaver system in New Zealand illustrates the fact that matching contributions can reach a more equal treatment of government spending across income groups. The government makes an annual contribution towards KiwiSaver accounts (called member tax credit) of 50 cents for every dollar of member contribution annually, up to a maximum payment of NZD 521.43. Figure 5.1 shows that member tax credit payments are evenly distributed for individuals in the top 60% of the income distribution (i.e. fourth decile and up). This is due to the cap on the state contribution. However, individuals at the bottom of the income distribution get proportionately less.

Finally, fixed nominal subsidies also help rebalancing the distribution of government spending with income when combined with tax incentives. In Germany, the government encourages people to contribute to a Riester plan through two types of incentive: tax exemptions and fixed nominal subsidies. There are three types of subsidy: a basic subsidy of EUR 175 per year and per person, a child subsidy of EUR 300 per year and per child and a young worker subsidy of EUR 200 granted once at the age of 25. In addition, all Riester savings up to EUR 2 100 (including subsidies) can be claimed as a special expense deduction in the annual income tax return. Corneo, Schröder and König (2015^[8]) assess the distributional impact of the Riester pension scheme using survey data from 2012. They find that the average subsidy (in the form of fixed nominal subsidies or tax deductions) increases with income, from EUR 23.56 in the bottom decile, to EUR 56.83 at the 6th decile and to EUR 156 for the top decile. Around 38% of the total subsidy paid by the government (tax expenditure and direct spending) goes to the 20% richest individuals, while only 7.3% accrues to the 20% poorest ones. The fact that high-income earners participate more to the Riester pension scheme explains this result. Although the total subsidy is still skewed towards high-income households, the share going to low-income households is much higher than in countries having only tax incentives (the 20-25% poorest individuals receive less than 1% of the tax expenditure related to private pensions in Canada, 0.4% in Ireland, and 2% in the United States).

Limitations of national tax expenditure reports for cross-country comparisons

Although all the countries listed in Table 5.1 calculate tax expenditures using similar methodologies (revenue-forgone method with the cash-flow approach), tax expenditures related to the tax treatment of retirement schemes are difficult to compare across countries.

The items reported as tax expenditures vary across countries. For example, some countries include the tax collected on pension withdrawals, reporting it as a negative tax

expenditure, (e.g. Australia, Canada, Switzerland and the United Kingdom), while other countries only communicate tax revenues forgone (e.g. Belgium, France and Ireland). In the United States, both tax expenditure reports account for the net result of summing up revenues forgone on contributions, revenues forgone on investment returns and revenues collected on withdrawals, but individual flows are not reported (there is only a breakdown by type of plan). In Austria, Germany and New Zealand, tax expenditure reports account for subsidies or matching contributions paid into the pension accounts of entitled individuals. These are direct spending, not tax expenditures. Finally, in Sweden, the tax exemption of contributions to occupational pension plans is not considered as a tax expenditure. The tax expenditure report only accounts for revenues forgone due to the reduced tax on returns.

Some countries clearly warn that different tax expenditure items cannot be summed up, while other countries include net aggregate numbers (revenues forgone on contributions plus revenues forgone on accrued income minus revenues collected on withdrawals) in their report. For example, the Australian Treasury mentions in its *Tax Expenditure Statement* that it is not appropriate to aggregate revenue-forgone estimates because they do not take into account potential changes in taxpayer behaviour following the hypothetical removal of a tax concession. In addition, the tax expenditure resulting from the assumption that all the tax concessions were cancelled at the same time (e.g. changing simultaneously the tax treatment of pension plans for contributions, investment returns and withdrawals) is different from the sum of the tax expenditures of each tax concession. For instance, if only the tax concession on contributions was removed (i.e. contributions would no longer be deductible from income), individuals would save less through these plans, implying a reduction in tax revenues forgone on investment returns.

Finally, the revenue-forgone calculation of the tax exemption of investment returns accruing in pension funds is likely to be overestimated in a number of cases. Indeed, the investment income achieved by pension funds is likely to be larger than the one that would be achieved in the tax benchmark. Usually, the tax benchmark is some version of the comprehensive income tax regime (“TTE”), and so after-tax contributions accumulating in the benchmark are lower than those accumulating in a pension fund for which contributions are tax-deductible. In the United States, the cash-flow calculations do not take this into account and assume that all of the money contributed to a pension plan is, instead, contributed to a benchmark taxable account. This therefore overestimates tax revenues forgone on investment returns. The present-value calculations, however, assume that only after-tax contributions accumulate in the tax benchmark.

This chapter estimates subsequently the net tax expenditure associated with the tax treatment of retirement savings, today and into the future, based on the revenue-forgone method and using the cash-flow approach. Tax expenditure reports are not suited to compare the burden related to the tax treatment of retirement savings on the government budget across countries. There is therefore a need for another measure. The net tax expenditure in a given year is calculated as the net amount of revenues forgone on contributions, revenues forgone on accrued income and revenues collected on withdrawals. Revenues forgone on accrued income are calculated taking into account the reduction coming from taxed contributions in the benchmark.³ This methodology is well suited to capture the influence of demographic changes as it looks at the profile of the net tax expenditure at different points in time. Section 5.2 demonstrates the convenience of this measure with the use of simple and straightforward examples and Section 5.3 presents the results for ten selected OECD countries.⁴ Annex 5.A provides the full methodology.

5.2. Simple and straightforward models of the net tax expenditure

This section explores the relationship between the net tax expenditure and economic variables, the maturity of pension systems, and demographic trends with the help of simple and straightforward models. These models can assist in better understanding the mechanisms behind the net tax expenditure and thus understand the different factors behind the country-specific results (Section 5.3).

For retirement savings plans where both contributions and returns on investments are exempted from taxation while benefits are treated as taxable income upon withdrawal (“Exempt-Exempt-Taxed” or “EET” tax regime), the cash-flow net tax expenditure for year t , NTE_t , with respect to a “TTE” benchmark, may be expressed as

$$NTE_t = \mu_C C_t + \mu_A i A'_{t-1} - \mu_B B_t \quad \text{Equation 1}$$

C_t and B_t are contributions to and benefits paid out of private pension plans in year t , A_{t-1} is the level of assets in the plans at the end of the previous year, i is the nominal pre-tax rate of return on plan assets in the year and μ_C , μ_A and μ_B are the average marginal personal income tax rates applicable to contributions, investment income and benefits respectively.⁵ The parameters i , μ_C , μ_A and μ_B are assumed constant over time.

When only taking into account personal income tax revenues, the net tax expenditure incurred by an “EET” arrangement as compared to a “TTE” benchmark has three components. Private pension contributions are tax-deductible, unlike savings under the benchmark tax system (e.g. a traditional savings account). The first term of Equation 1, $\mu_C C_t$, therefore represents tax revenues forgone on contributions, i.e. the amount of tax that would have been collected by the Treasury had the contributions been invested in a benchmark savings vehicle.

Investment income accrues tax free in a private pension plan but is taxed in the benchmark savings vehicle. The second term of Equation 1, $\mu_A i A'_{t-1}$, therefore represents tax revenues forgone on accrued income. The relevant stock of assets to calculate the revenue forgone on accrued income is not the total assets invested in the pension scheme (A_{t-1}) but those accumulated from diverted savings (A'_{t-1}). The reason for including only a subcomponent of total assets is that some of the contributions would not have generated investment income in the absence of the tax-favoured scheme. Contributions can be decomposed between the tax break (forgone tax revenues on contributions), $\mu_C C_t$, and personal savings, $(1 - \mu_C)C_t$. Personal savings can in turn be split between diverted savings, $(1 - \alpha)(1 - \mu_C)C_t$, and new savings, $\alpha(1 - \mu_C)C_t$, where α is the share of personal savings stemming from a decline in consumption (new savings). Since neither the new savings nor the tax break would have generated investment income in the absence of the tax-favoured scheme, they have to be excluded from the calculation of forgone tax revenues on accrued income, which requires a second asset accumulation based on diverted savings alone. The two asset accumulation equations may be expressed as

$$A_t = (1 + i)A_{t-1} + C_t - B_t \quad \text{Equation 2}$$

$$A'_t = (1 + i)A'_{t-1} + (1 - \alpha)(1 - \mu_C)C_t - B'_t \quad \text{Equation 3}$$

Finally, the third term of Equation 1, $\mu_B B_t$, represents tax revenues collected on withdrawals from the private pension system (withdrawals are tax-free in the benchmark).

Changes in the level of the net tax expenditure over time depend primarily on differences in the growth patterns of contributions, assets and benefits. To produce a negative value

of the net tax expenditure, having a higher level of benefits than contributions is not sufficient. The tax collected on benefits must exceed the forgone tax on both contributions and accrued income.

Making the simplifying assumptions of a single marginal tax rate, $\mu_C = \mu_A = \mu_B = \mu$, and that all contributions come from diverted savings (i.e. no new savings, $\alpha=0$), the net tax expenditure may be written as

$$NTE_t = \mu[A_t - A_{t-1}(1 + \mu i)] \quad \text{Equation 4}$$

This shows that the net tax expenditure is positive as long as the year-over-year rate of increase in assets is larger than μi .

Steady state

Assessing the steady state can help to better understand the mechanisms behind the net tax expenditure. In steady state, the pension system is mature (i.e. the contribution and benefit levels as a percentage of earnings are constant), there are no demographic shifts (i.e. the population at each age group is equal and grows at a constant rate over time), the rate of return on assets is constant, and earnings (and GDP) grow at a constant rate. In this case, contributions, assets, benefits and the net tax expenditure will all be constant fractions of GDP. Let Y_t be GDP, k the constant share of assets over GDP, so that $A_t = kY_t$, and g the growth rate of GDP, so that $Y_t = (1+g)Y_{t-1}$.⁶

In steady state, the net tax expenditure will be positive as long as the growth of GDP (determined by population growth, real wage growth and inflation) is greater than the product of the marginal tax rate and the nominal pre-tax rate of return on plan assets. The latter is a tax wedge on returns on investment that measures the rate of loss in returns due to taxation. Rearranging Equation 4 and using the steady state assumptions above, the net tax expenditure can be expressed as a fraction of GDP as

$$\frac{NTE_t}{Y_t} = \mu k \left(\frac{g - \mu i}{1 + g} \right) \quad \text{Equation 5}$$

Another interesting steady-state result concerns the relationship between contributions and benefits. By rearranging Equation 2 and using the previous assumptions, the excess of benefits over contributions can be expressed as a fraction of GDP, as

$$\frac{B_t - C_t}{Y_t} = k \frac{(i - g)}{(1 + g)} \quad \text{Equation 6}$$

This shows that benefits, funded out of both contributions and investment income, can exceed contributions on a permanent basis as long as the nominal pre-tax rate of return is greater than the GDP growth rate. The size of the excess depends on the asset level and the difference between the rate of return on assets and GDP growth. For example, assuming $\mu = 0.30$, $k = 1.3$, $g = 0.0328$ (1.25% real growth and 2% inflation) and $i = 0.0506$ (a 3% real rate of return and 2% inflation), the net tax expenditure equals 0.66% of GDP and the excess of benefits over contributions equals 2.2% of GDP. With a contribution level of 3.0% of GDP for example, benefits are permanently 75% higher than contributions (5.2% vs. 3.0% of GDP).

Even where benefits well exceed contributions, the net tax expenditure remains positive in the steady state if nominal GDP growth is above “ μi ”. Equation 2 and Equation 4 can be rearranged to show that the net tax expenditure will be positive as long as the amount

of investment income generated in the year by personal savings is greater than the excess of benefits over contributions. This point is relevant to non-steady-state cases as well. In most situations where benefits substantially exceed contributions, they will be accompanied by high levels of assets and investment income.

The steady-state net tax expenditure is larger when the average tax rate is lower during retirement than while working. Individuals may have lower income during retirement than while working, thereby reducing their average tax rate on withdrawals and thus increasing the net tax expenditure. For example, assuming $\mu_B=0.20$ instead of $\mu_B=0.30$ (while keeping $\mu_C=\mu_A=0.30$), increases the net tax expenditure from 0.66% of GDP to 1.19% of GDP. This stems from the fact that tax revenues collected on pension withdrawals are lower, while tax revenues forgone on contributions and accrued income are still the same.

Steady-state results provide a reference point to be able to assess future tax expenditure levels. Changes in economic variables, such as investment returns and the rate of wage growth, the level of maturity of the pension system and demographics (different sizes of age cohorts, e.g. baby-boom cohorts, immigration) will provide results that deviate from the steady state. Notwithstanding, the steady state provides an indication of the magnitude of the deviations.

The maturing of the pension system

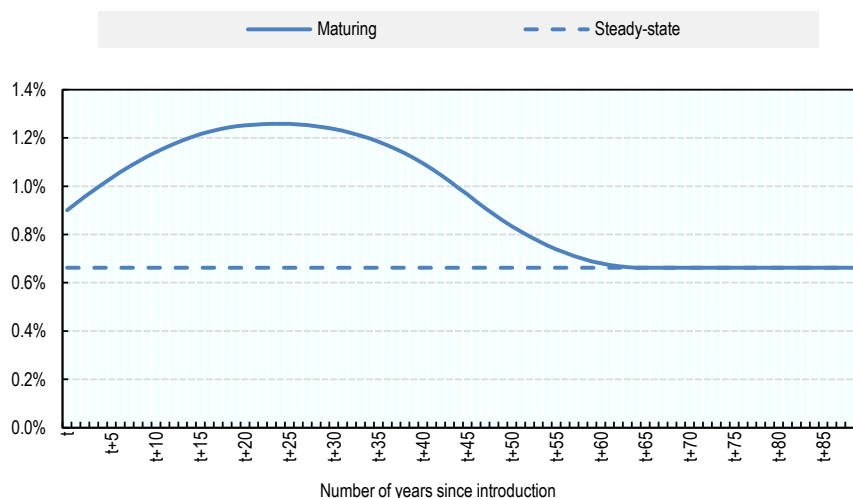
A mature pension system is one in which current retirees draw their pension based on a full career and constant contribution rules. Individuals who were already in the labour market when a new pension system was introduced will draw a pension which accumulated for part of their career only. Similarly, if the contribution rate to the system changes, it will take some time before retirees start drawing a pension which accumulated at the new contribution rate for their entire career. While the system is still maturing, aggregated asset and benefit levels increase over time until they reach a stable level (steady state).

A simple, straightforward model of the retirement saving process can help in understanding the effect of introducing a new private pension system on the net tax expenditure over time.⁷ In this model, individuals save from age 20 to 64 and draw pension benefits from age 65 to 84. The pension of each individual is drawn according to a certain annuity with fixed nominal payments that, by age 84 (when the individual passes away), exhausts the assets accumulated at age 64. The number of people in each single-year age cohort is assumed to be equal.

The net tax expenditure rises sharply when the contributions to the new pension system begin and converges to the steady state over time. Figure 5.2 presents projections of net tax expenditure levels for two cases. In the steady state, contribution levels are constant across (pre-retirement) age groups and constant over time. As above, the return on assets is 5.06% and the rate of wage growth is 3.28%. With an aggregate contribution level of 3% of GDP and a constant marginal tax rate of 30% on contributions, investment income and benefits, the resulting net tax expenditure is constant at 0.66% of GDP. In the second case of a pension system that is maturing, the model assumes that the pension system was introduced in year t and that contributions started in that same year. The pension of someone reaching age 65 in year $t+10$, for example, is based on only 10 years of contributions. The net tax expenditure first rises well above its steady-state level before declining back to it. The year when the pension system is introduced, $NTET = \mu_C t$ (30% of 3% of GDP = 0.90% of GDP).⁸ The system attains full maturity and reaches its steady-state level of 0.66% of GDP only in year $t+64$, the first year in which all of the retirees (up to the 84-year-olds, who were aged 20 in year t) have contributed for their full careers.⁹

Figure 5.2. Net tax expenditure: Steady-state and maturing system models

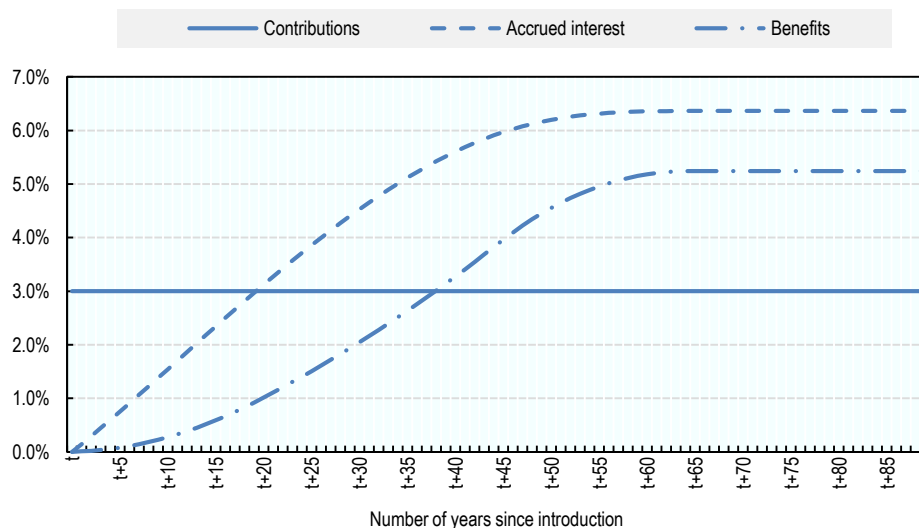
As a percentage of GDP

StatLink  <http://dx.doi.org/10.1787/888933850811>

The lag in the growth of benefits behind that of assets and investment income is what creates the temporary increase in the net tax expenditure above its steady-state level. Figure 5.3 helps to explain the drivers of the previous result by displaying how the three components of the net tax expenditure (i.e. C_t , iA_{t-1} and B_t) evolve over time. As the density of contributions progresses, asset and investment income levels grow and so, with a lag, do benefit levels.

Figure 5.3. Net tax expenditure components: Maturing system model

As a percentage of GDP

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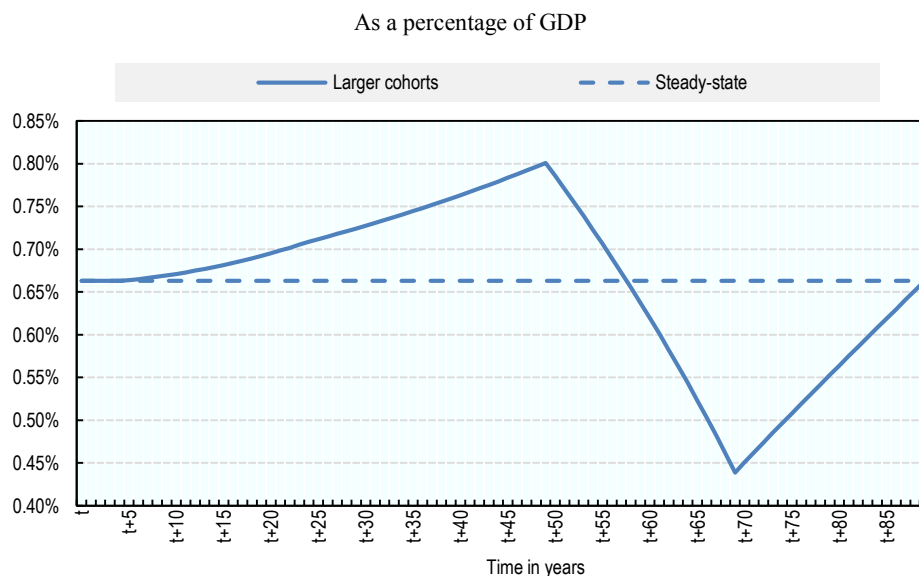
A maturing pension system can create a fairly long period of declining tax expenditures (from $t+42$ to $t+64$ in this straightforward model) but only from a level that is temporarily above its steady-state value.

Assessing a pension system's development as it matures provides a cautionary tale to policy makers. Introducing a pension system with "EET" tax advantages for retirement savings creates a larger upfront net tax expenditure. It is only several decades later that the new pension system and its tax expenditure reach a stationary situation. Therefore, unless this is fully disclosed and accounted for when introducing reforms, the potential upfront fiscal cost may create a political backlash, especially in times of economic crises. This problem may be compounded if, at the time when the new system with "EET" tax advantages is being introduced, the cohorts entering the labour market are larger than those about to retire.

Impact of the ageing of population cohorts that are larger than the previous ones

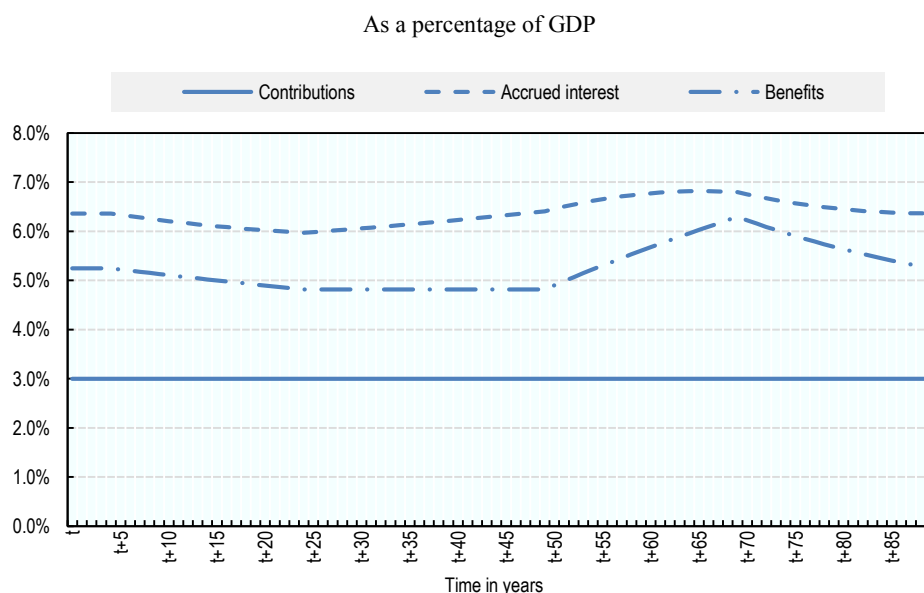
Larger cohorts entering the labour market than those retiring translates into higher contributions and higher assets until they retire, bringing the net tax expenditure above the steady state for a while and below it afterwards, until the larger cohorts pass away and the steady state is reached again. To investigate the effects of a population bulge on pension flows and the net tax expenditure, the steady-state model is adjusted by increasing the sizes of the cohorts entering the labour market between $t+5$ and $t+24$ by 20% (compared to previous and following cohorts). These individuals reach age 65 between $t+50$ and $t+69$, and by year $t+89$ they have disappeared from the model. The results are shown in Figure 5.4 and Figure 5.5.

Figure 5.4. Net tax expenditure: Steady-state and larger cohorts models



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The net tax expenditure for the larger-cohorts case rises above that of the steady state to a peak in year $t+49$ and then declines sharply to reach a minimum value in year $t+69$, the only year in which all of the retired population is composed of individuals in the larger cohorts. After year $t+69$, the net tax expenditure rises, reaching its steady-state level again in year $t+89$.

Figure 5.5. Net tax expenditure components: Larger cohorts' model

StatLink  <http://dx.doi.org/10.1787/888933850868>

Asset and benefit levels are slightly lower as percentages of GDP up to year t+54 than with no population bulge. After that point they rise to higher levels. This is because the first effect of the larger cohorts is to raise the aggregate levels of earnings, GDP and contributions. Asset and benefit levels increase only with a lag. It is also noteworthy that the kinks in the net tax expenditure and benefits lines in Figure 5.4 and Figure 5.5 result from the simplifying assumption that benefits commence abruptly at age 65 for everyone in the population.

In summary, these simple and straightforward models of the net tax expenditure and the retirement saving process show that both a maturing pension system and the ageing of larger cohorts can create substantial declines in the net tax expenditure level. These declines may even bring the net tax expenditure below the steady-state level.¹⁰ However, as long as the economy continues to grow in nominal terms above a rate at least equal to the product between the marginal tax rate and the rate of return (that measures the rate of loss on returns due to taxation), it may not be sufficient to reduce the net tax expenditure to zero or below zero.

5.3. Fiscal cost of tax and non-tax financial incentives for private pensions in selected OECD countries

This section presents the results of projecting the net tax expenditure between 2015 and 2060 arising from the tax treatment of private pension schemes in 10 OECD countries. The net tax expenditure in a given year is measured as the net amount of revenues forgone on contributions, revenues forgone on accrued income and revenues collected on withdrawals, relative to a “TTE” benchmark.¹¹ It adds to direct spending associated with government financial incentives, when relevant, in order to estimate a total fiscal cost.

The amount of information necessary to make these calculations is quite substantial. Generating estimates of the future profile of the net tax expenditure requires projecting

forward a number of key variables including the number of contributors, total contributions, total assets, accrued income from assets, number of beneficiaries and withdrawals, all of which will be strongly influenced by future demographic developments. First, in order to calculate the net tax expenditure in the first year (i.e. 2015) it is necessary to have information on the amounts of contributions, accrued income and withdrawals in that year and to have these amounts broken down by age groups. Indeed, individuals of different ages have different income sources and face different tax rates. Applying the same tax rate independently of age as done in the models of Section 5.2 would not reflect the actual dynamics of tax expenditures and receipts. Second, in order to calculate the future value of contributions, accrued income and withdrawals, it is important to have information on the number of people contributing, holding assets and withdrawing benefits in the first year, broken down by age groups. This information is used to build ratios of contributors, asset holders and beneficiaries with respect to the total population or to the total employed population. Keeping these ratios constant in the future and using population projections (e.g. from the United Nations) enables projections of the future number of contributors and beneficiaries, and in turn the future value of contributions, accrued income and withdrawals. In general, therefore, the estimation of the future profile of the net tax expenditure requires a breakdown by age in 2015 of the number of contributors, total contributions, total assets, the number of beneficiaries and total withdrawals.

The country coverage has been primarily conditioned by the amount of available information. The analysis herein focuses therefore on 10 OECD countries for which the OECD Secretariat was able to get appropriate data and that provide a range of different characteristics. The countries examined are Australia, Canada, Chile, Denmark, Iceland, Latvia, Mexico, New Zealand, the Slovak Republic and the United States. As shown in Table 5.2, the private pension plans in these countries have different tax treatments and in the case of Australia, Chile, Mexico and New Zealand, government non-tax financial incentives (matching contributions and/or subsidies) also apply. In addition, the systems covered have a different nature (i.e. mandatory vs voluntary, occupational vs personal) and various levels of maturity.

Table 5.2. Country characteristics

Country	System	Tax regime	Non-tax financial incentives	Full maturity
Australia	Mandatory occupational and personal	ttE	Matching contributions	2057-2090
Australia	Voluntary personal	TtE	Matching contributions	2057
Canada	Voluntary occupational and personal	EET		2022
Chile	Mandatory personal	EET	Subsidies and matching contributions	2056
Denmark	Quasi-mandatory occupational	EtT		2055-2070
Iceland	Mandatory occupational	EET		2045-2083
Latvia	Mandatory personal	EET		2066-2081
Mexico	Mandatory personal	EEE	Subsidies and matching contributions	2062-2072
New Zealand	Voluntary with automatic enrolment (KiwiSaver)	ttE	Matching contributions	2072
Slovak Republic	Mandatory personal	EEE		2070-2089
Slovak Republic	Voluntary personal	tTE		2061
United States	Voluntary occupational and personal	EET		2025-2043

The maturity of a private pension system is not easy to assess, as systems continue to develop over time. In terms of existence, the private pension systems have been in place for more than 50 years in Canada, Denmark, Iceland and the United States, 35 years in Chile, 25 years in Australia, 20 years in the Slovak Republic and Mexico, 15 years in Latvia and 10 years for the KiwiSaver system in New Zealand.

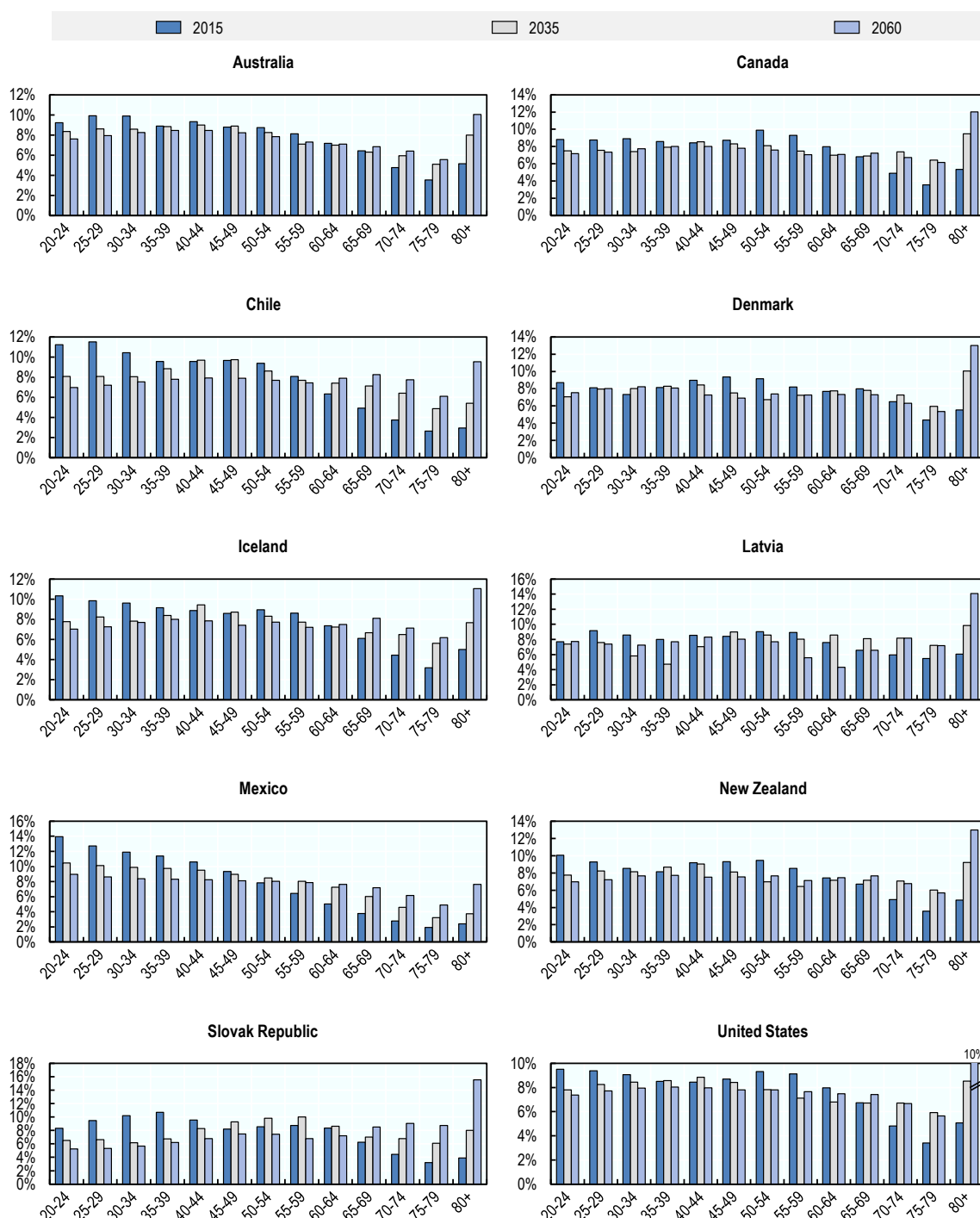
In addition, changes to the systems may affect their maturity:

- Australia: The mandatory contribution rate to the superannuation system, which was created in 1992, will continue to gradually increase up to 12% in 2025 (from 9% in 2014).
- Denmark: Occupational pension plans have been in place since the 1950s for certain groups of workers (e.g. civil servants, teachers, nurses). In the 1990s, coverage of occupational plans was greatly increased through collective agreements. However, the contribution rates were initially set at very low levels and gradually increased to reach the full contribution rate of around 15% only in the mid-2000s. Therefore, in 2035 all new retirees will be able to get private pension benefits based on a full career, but only in 2050 will these benefits be based on a full career and a full contribution rate.
- Iceland: Occupational pension funds have existed since 1921 but became available to the general public in 1969, with mandatory membership from 1974 for wage earners and from 1980 for the self-employed. Full maturity will therefore be reached in 2045. In addition, contribution rates have been raised over time, from 10% of basic salary initially to 10% of total salary in 1989, 12% in 2007 and 15.5% from 2018 onwards.
- Latvia: The mandatory funded pension system was created in 2001 and has seen several revisions of the contribution rate (6% from 2016 onwards).
- Mexico: The funded private pension system was created in 1997 for private sector workers and in 2007 for public sector workers.
- Slovak Republic: The mandatory contribution rate to the individual retirement accounts system, which was created in 2005, is being gradually increased between 2016 and 2024 from 4% to 6%.
- United States: The share of workers participating in a private pension plan at any point in time has been broadly constant since 1960. However, new types of plan have been introduced over time (e.g. 401(k) plans in 1978, Roth IRAs in the late 1990s, and Roth 401(k) in 2006), leading to a shift from defined benefit to defined contribution plans that may affect contribution levels, and therefore the maturity of the system.¹²

The structure of the population is expected to change over the next 45 years, with individuals aged 65 and older representing an increasing share of the population aged 20 and older. Figure 5.6 shows the structure of the population aged 20 and older in the 10 countries for 2015, 2035 and 2060. Between 2015 and 2060, the share of individuals aged 65 and older in the population aged 20 and older will increase from around 20% to 30-33% in the developed countries (Australia, Canada, Denmark, Iceland, Latvia, New Zealand and the United States). The increase is steeper for developing countries: from 14% to 32% in Chile, from 11% to 26% in Mexico and from 18% to 42% in the Slovak Republic. Except for Mexico and the Slovak Republic, the largest increase will happen between 2015 and 2035 (by 5 percentage points in Australia, 7 pp in Denmark and Iceland, 8 pp in the United States, 9 pp in Canada, Latvia and New Zealand, and 10 pp in Chile).

Figure 5.6. Structure of the population aged 20 and older in 2015, 2035 and 2060

As a percentage of the population aged 20 and older



Source: OECD Population and Labour Force Projections Database.

StatLink  <http://dx.doi.org/10.1787/888933850887>

The total fiscal cost of financial incentives to promote savings for retirement varies greatly across countries, but remains in the low single digits of GDP. Figure 5.7 shows the total fiscal cost of financial incentives, including the net tax expenditure of tax incentives and its components, and the direct cost of non-tax incentives when they exist, for the 10 selected countries between 2015 and 2060. The fiscal cost varies from 2%-3% of GDP in Australia and Iceland to 0.1%-0.3% of GDP in Chile, Mexico, New Zealand and the Slovak Republic, and it even turns negative in Denmark, indicating an overall positive fiscal effect in the future.

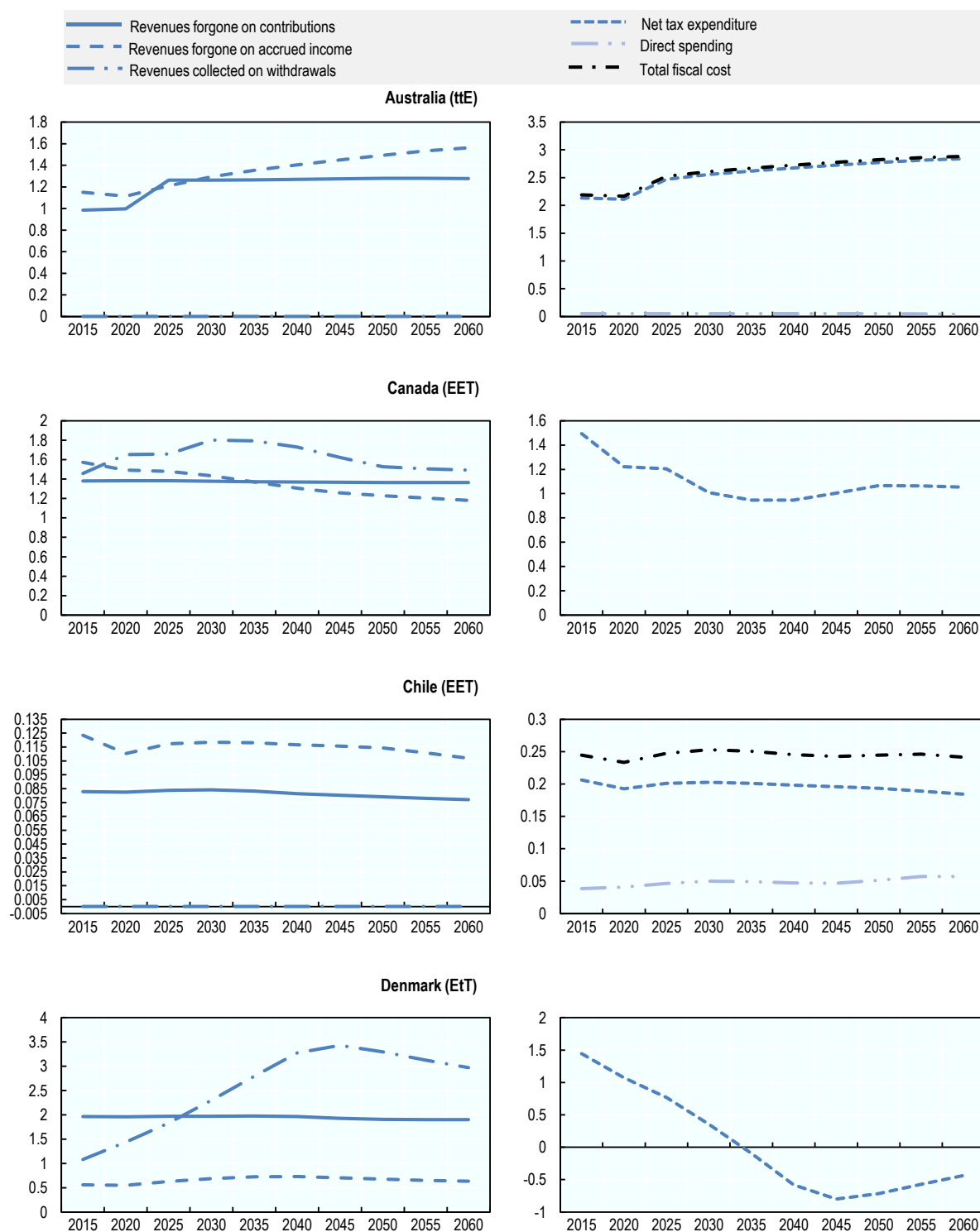
The increase in the total fiscal cost of private pensions in Australia projected for the next 45 years is mainly driven by the rise in the mandatory employer contribution rate.¹³ The mandatory employer contribution rate is 9.5% of ordinary earnings for financial years up to 30 June 2021, after this, the rate will increase by 0.5 percentage points per year until it reaches 12% from 1 July 2025. The maturing of the Australian private pension system, as more individuals receive the full contribution rate for an increasing portion of their career, creates a rise in the amount of investment income, which is taxed favourably as compared to traditional savings accounts. Figure 5.7 shows that tax revenues forgone on contributions increase until the contribution rate stabilises at 12% in 2025, while tax revenues forgone on accrued income keep increasing between 2020 and 2060. There is no tax collected on withdrawals when assuming that individuals retire at age 60 or older. The net tax expenditure is therefore expected to increase from 2.1% of GDP in 2015 to 2.8% of GDP in 2060. The total fiscal cost of private pensions also includes direct public spending in the form of matching contributions (the super co-contribution and the low income superannuation tax offset).¹⁴ This cost is modest and constant over the projected period, at around 0.05% of GDP.

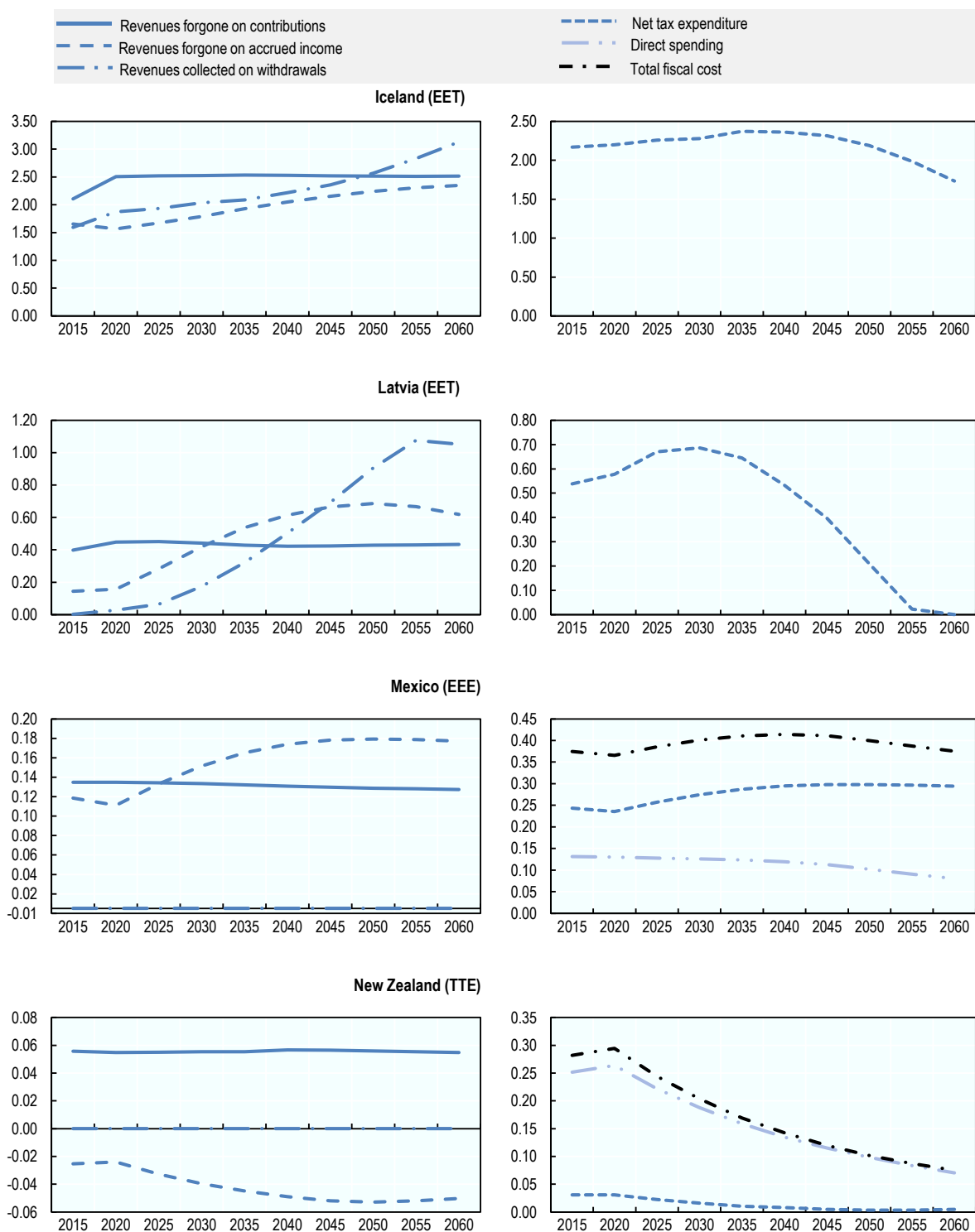
As the Canadian private pension system is already close to maturity, the remaining factor explaining the evolution of the net tax expenditure over time is future demographic developments. The main trend driving the U-shape of the net tax expenditure is the ageing of the baby-boom cohorts. As shown in Figure 5.6, individuals aged between 50 and 59 represent a large share of the population aged 20 and older today. These individuals will start retiring and withdrawing their pension benefits by 2025. Figure 5.7 indicates that tax revenues collected on withdrawals will reach a peak between 2030 and 2035, years during which all of the baby-boomers will be receiving pension benefits and paying personal income tax on them. As a result, the net tax expenditure is expected to decline from 1.5% of GDP in 2015 to 0.9% of GDP in 2035-2040 and to remain stable at around 1.1% of GDP thereafter.

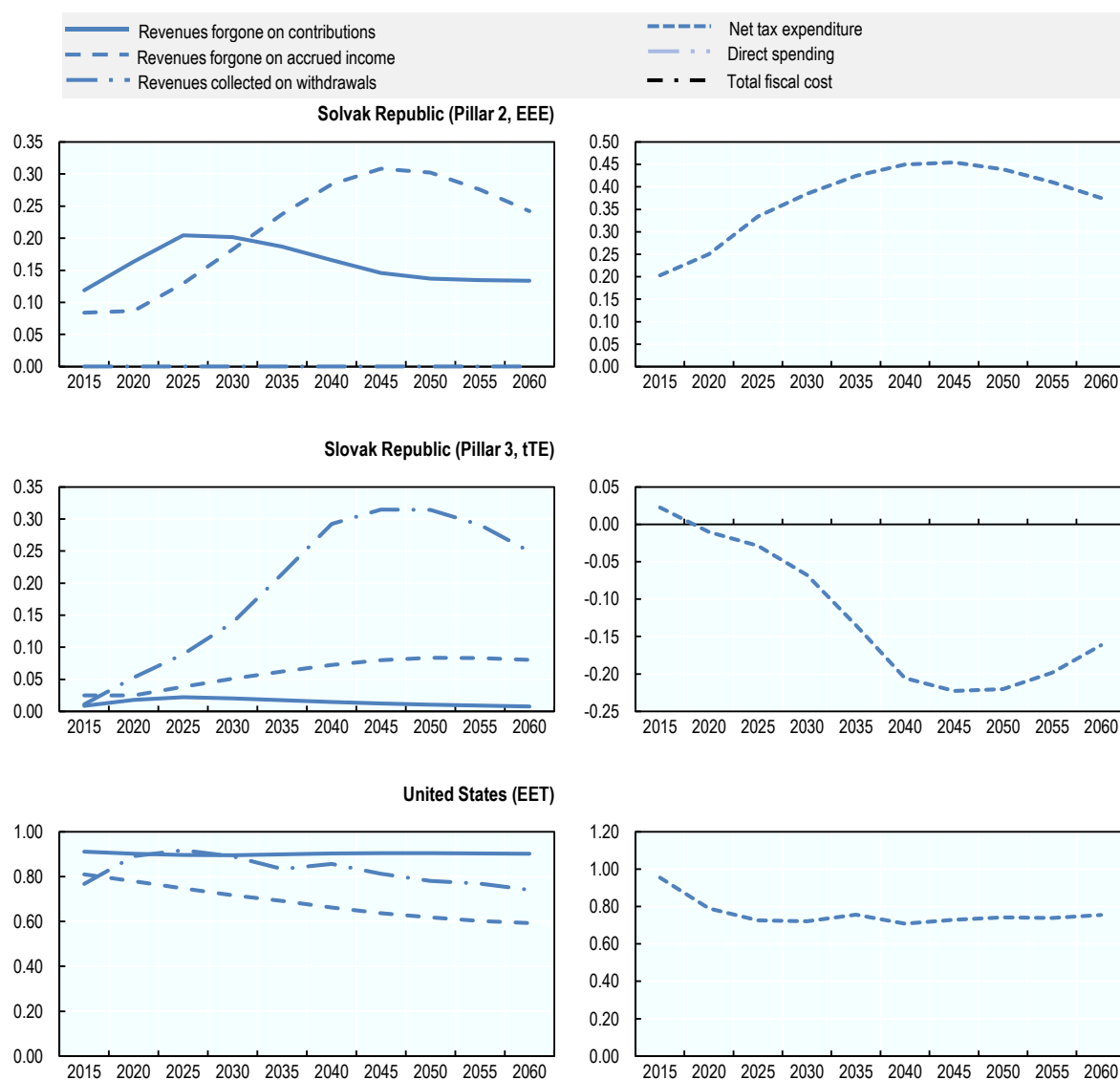
The total fiscal cost of private pensions in Chile is modest. As shown in Figure 5.7, between 2015 and 2060, the net tax expenditure will be around 0.2% of GDP. Indeed, wages are low in Chile, so that most individuals either do not pay income tax or pay tax at the marginal rate of 4%.¹⁵ Tax revenues forgone on contributions and accrued income are therefore small. In addition, as most pensioners do not pay taxes because their pensions are below the exempt limit, tax revenues collected on withdrawals are negligible. Direct public spending in the form of matching contributions (for young workers) and fixed nominal subsidies (for mothers) is also modest, at around 0.05% of GDP over the entire period. The total fiscal cost will remain constant between 2015 and 2060 at about 0.24% of GDP.

Figure 5.7. Projected net tax expenditure and total fiscal cost in selected OECD countries, 2015-2060

As a percentage of GDP







StatLink  <http://dx.doi.org/10.1787/888933850906>

In Denmark, the net tax expenditure is expected to decrease and turn negative in 2035. The main driver of this trend is the maturing of the system, as more and more people build a pension based on a full career and a full contribution rate. Consequently, tax revenues collected on withdrawals are expected to increase from 1.1% of GDP in 2015 to 3.4% of GDP in 2045. The decline observed in tax revenues collected on withdrawals after 2045 is due to demographic trends, as cohorts entering retirement after 2045 will be smaller than the previous ones. On the other hand, tax revenues forgone on contributions and on accrued income will remain broadly constant over the period 2015-2060, at around 1.9% of GDP and 0.6% of GDP respectively.¹⁶ The net tax expenditure will therefore decrease from 1.4% of GDP in 2015 to -0.8% of GDP in 2045, and increase afterwards up to -0.4% of GDP in 2060.

In Iceland, the increase in the contribution rate will create a transition period during which the system will be maturing, so that the net tax expenditure will first increase and then decrease. Between 2016 and 2018 the contribution rate to the mandatory occupational pension system for private sector workers is being raised gradually from 12% to 15.5%.¹⁷ The system will therefore be maturing until future retirees draw their pension based on a full career and the full contribution rate. As described in Section 5.2, in a maturing system the net tax expenditure first increases because there is a lag in the growth of benefits behind that of assets and investment income. It then declines when individuals start withdrawing benefits based on a full contribution rate. The net tax expenditure related to mandatory occupational pensions in Iceland is therefore expected to rise from 2.2% of GDP in 2015 to 2.4% of GDP in 2035, before declining to 1.7% of GDP in 2060.

The Latvian system is still maturing, leading to a temporary increase in the net tax expenditure, before declining. The net tax expenditure will peak around 2030, at 0.69% of GDP and will decline thereafter to become negligible in 2060. As the system matures, the assets in the system grow and so do tax revenues forgone on accrued income (from 0.14% of GDP in 2015 to 0.69% of GDP in 2050). In addition, as more individuals receive a pension income based on their full career over time, tax revenues collected on withdrawal increase from close to 0% of GDP in 2015 to just above 1% of GDP in 2055.

In Mexico, the total fiscal cost of mandatory individual retirement accounts is expected to remain stable at around 0.37% of GDP over 2015-2060, with a peak at 0.41% of GDP between 2035 and 2045. This is the result of opposite trends for the net tax expenditure and direct public spending. As the system was created in 1997 for private sector workers and in 2007 for public sector workers, the system is still maturing. As assets continue to grow, tax revenues forgone on accrued income increase from 0.11% of GDP in 2015, until they reach a plateau at around 0.17% of GDP in 2040. As the analysis assumes that pension benefits remain below the tax-exemption limit of 15 times the annual minimum wage, tax revenues collected on withdrawals remain null over the whole period. Overall, the net tax expenditure will therefore increase, from 0.24% of GDP in 2015 to 0.29% of GDP in 2060. In addition, the government makes two types of contribution into individual accounts, one expressed as a percentage of salary (0.225% for private sector workers) and one based on a fixed amount that depends on the number of days worked and the salary level (social quota). The social quota is the most expensive of the two. As the analysis assumes that the maximum level of the social quota increases in line with inflation, the amount spent by the government on that subsidy decreases relative to GDP.¹⁸

The declining trend in the total fiscal cost of KiwiSaver schemes in New Zealand is driven by the decrease in direct public spending. The government makes an annual contribution towards KiwiSaver accounts equivalent to 50 cents for every dollar of member contribution annually, up to a maximum payment of NZD 521.43.¹⁹ As the maximum amount for the government matching contribution has been divided by two in 2011 and has remained at the same level since then, the analysis assumes that it will stay at NZD 521.43 for the next 45 years. As a percentage of GDP, the expenses linked to the payment of the government matching contribution will therefore decline over time.²⁰ Moreover, the net tax expenditure related to the tax treatment of KiwiSaver schemes is negligible. Indeed, contributions are taxed, but for employees in some income bands, the rate applied to employer contributions is lower than the personal income tax rate, creating tax revenues forgone equivalent to 0.06% of GDP. This is reduced by revenues collected on accrued income, as accrued income is taxed and higher than in the absence of the scheme (because the benchmark tax system would not receive the government matching contribution).

The individual retirement accounts system in the Slovak Republic (pillar 2) is still maturing, leading to a temporary increase in the net tax expenditure. This trend will be reversed due to a drop in the population combined with a change in the age structure of plan participants. As the system was introduced in 2005, the assets have not reached their long-term level yet (cf. Section 5.2). In addition, the mandatory contribution rate is being gradually increased between 2016 and 2024 from 4% to 6%. Tax revenues forgone on contributions are therefore expected to rise from 0.12% of GDP in 2015 to 0.20% of GDP in 2025. Tax revenues forgone on accrued income are also expected to rise from 0.08% of GDP in 2015 to 0.31% of GDP in 2045. However, the Slovakian population aged 20 and older is expected to decline after 2035, from 4.3 million to 3.8 million in 2060. In addition, rules for the participation in the system have changed several times.²¹ According to the Ministry of Labour, Social Affairs and Family, the distribution of participants today is biased towards younger generations. This is expected to change since current participants will be ageing and mandatory participation has been removed. The net tax expenditure is therefore expected to peak in 2045 at 0.45% of GDP and decline thereafter. There is no tax collected on withdrawals (“EEE” tax system).

The net tax expenditure related to supplementary pension plans in the Slovak Republic (pillar 3) may turn negative in 2020 and go further down thereafter.²² For these plans, contributions are tax deductible, but only up to EUR 180, investment income is tax free during the accumulation period and, upon withdrawal, the part of the assets originated from investment income is taxed.²³ As these plans have been introduced in 1996, the system is still maturing. This explains the increase in tax revenues collected on accrued income upon withdrawal, from 0.01% of GDP in 2015 to 0.31% of GDP in 2045. From 2020, tax revenues collected on accrued income will offset tax revenues forgone on contributions (stable at around 0.1% of GDP) and on accrued income during the accumulation phase (increasing from 0.02% of GDP in 2015 to 0.08% of GDP in 2050). Combining both systems, the net tax expenditure related to private pensions in the Slovak Republic will remain positive over the period 2015-2060, increasing from 0.23% of GDP in 2015 to 0.32% of GDP in 2030 and then declining to 0.21% in 2060.

Finally, in the United States, the net tax expenditure related to private pensions is expected to decline from 1.0% of GDP in 2015 to 0.7% of GDP in 2040 and then to remain broadly constant. There are two potential driving factors. The first one is the ageing of the baby-boom cohorts born between 1946 and 1964. Tax revenues collected on withdrawals are expected to increase as these cohorts enter retirement, from 0.77% of GDP in 2015 to 0.92% of GDP in 2025.²⁴ The decline in tax revenues collected on withdrawals thereafter (to 0.74% of GDP in 2060) stems from the fact that the baby-boom cohorts gradually pass away and are replaced by smaller cohorts of retirees. The ageing of the baby-boom cohorts may not explain however the continuous declining trend in tax revenues forgone on accrued income over the entire period (from 0.8% of GDP in 2015 to 0.6% of GDP in 2060).²⁵ Another explanatory factor could be the shift from defined benefit to defined contribution pension plans (OECD, 2016^[9]). This shift may have reduced overall contribution levels, in turn reducing assets accumulated by younger generations.

5.4. Potential impact of incorporating corporate income tax and new savings effects into the calculation of the net tax expenditure

The calculations presented earlier only take into account the impact of tax incentives for retirement savings on personal income tax revenues. However, the preferential tax

treatment of private pension plans may have an impact on other government revenues, either directly or indirectly.

This section complements the previous analysis by incorporating corporate income tax revenues and new savings effects into the calculation of the net tax expenditure. It first presents the potential effects of financial incentives on general government revenues other than personal income tax. It then adjusts the earlier model of the net tax expenditure to account for corporate income tax and new savings effects. This section, however, does not update the net tax expenditure calculations of Section 5.3 for the selected OECD countries, as this would require too many assumptions.

Effects of financial incentives to promote savings for retirement on other general government revenues

The tax treatment of retirement savings may affect the general government budget through its impact on different sources of revenues. As discussed in the previous sections, the tax treatment of retirement savings has a direct impact on personal income tax revenues. Other government revenues may be affected as well.

First, the tax treatment of retirement savings has a direct impact on corporate income tax revenues, provided that some of the savings are invested in domestic equities or corporate bonds. Feldstein (1995_[10]) argued that traditional estimates of the net tax expenditure related to tax-favoured private pension plans systematically over-estimate the true cost because they fail to account for corporate income tax revenues. Looking at the effects of tax incentives for Individual Retirement Arrangements (IRAs) on government revenue and national savings in the United States, he claims that IRAs increase personal savings and that these additional savings are divided between the corporate sector capital stock, the non-corporate sector capital stock and net foreign investment. Some of the increase in national savings therefore raises the corporate capital stock. This in turn increases the productive capacity of companies and thereby the overall level of profits, which are subject to corporate income tax. He finds that tax incentives may lead to a revenue increase for the government in the medium term. Ruggeri and Fougère (1997_[11]) agreed but questioned some of the assumptions used in Feldstein (1995_[10]). They concluded that tax-favoured savings plans reduce tax revenues but that the magnitude of the effect may not be large once corporate income tax is taken into account.

Second, the tax treatment of retirement savings may also affect consumption tax revenues. This potential impact applies only if some of the savings originate from money that the individual would not have saved in the absence of the tax-favoured private pension plan (i.e. new savings). New savings are indeed financed by a reduction in consumption, therefore lowering consumption tax revenues during contribution years. In addition, as new savings would not have accumulated in the absence of tax-favoured schemes, the pension benefits withdrawn from the tax-favoured plan will be higher than those withdrawn from the tax benchmark, therefore increasing consumption tax revenues during the retirement period.

Third, there are other indirect effects on tax revenues that may also be triggered by the tax treatment of retirement savings. New savings provide a source of funds available for domestic investment, which in turn is a key driver of labour productivity, higher future living standards, economic growth and wage growth.²⁶ Therefore, new savings may lead to higher future personal income tax revenues collected on wages and higher overall taxation from higher economic growth. In addition, tax incentives may encourage people to save for retirement, therefore relieving the government of the payment of selected

social benefits. For example, in countries with means-tested public pensions, if private pensions turn out to be high, a lower proportion of the population may fall under the means-tested threshold and qualify for the public pension, therefore decreasing the cost for the government.

Finally, how private pension plans are treated when calculating social contributions also has a direct impact on the social security budget. As shown in Chapter 2, contributions to private pension plans are sometimes exempt from social contributions or enjoy a reduced rate for social contributions, for example employer contributions to occupational pension plans in Austria and Belgium.²⁷ By contrast, contributions to the “TTE” tax benchmark would typically be subject to full social contributions. The social treatment of private pensions may therefore lead to revenues forgone in social security funds.

The following analysis focuses on the direct effects of the tax treatment of retirement savings on tax revenues. It therefore accounts for the direct impact on personal income tax, corporate income tax and consumption tax revenues. It abstracts from indirect effects at the macro-economic level that are more difficult to measure as it may involve a large degree of guesswork to come up with appropriate assumptions on productivity, wages and income. The analysis also abstracts from the treatment of private pensions when calculating social contributions.²⁸

Incorporating corporate income tax and new savings into the net tax expenditure calculations

The total net tax expenditure (TNTE) calculated in this section can be split into three components, depending on the tax source: personal income tax (PIT), corporate income tax (CIT) and consumption tax (VAT)

$$TNTE_t = PIT_t + CIT_t + VAT_t \quad \text{Equation 7}$$

The net tax expenditure related to private pension plans where both contributions and returns on investments are exempted from taxation while benefits are treated as taxable income upon withdrawal (“EET” tax regime), with respect to a “TTE” benchmark and when only taking into account personal income tax, PIT_t , corresponds to Equation 1 in Section 5.2.

The net tax expenditure related to corporate income tax is negative as it is a revenue increase. Corporate income tax is levied on company revenues when assets are invested in domestic equity.²⁹ The rate of return earned on pension contributions is therefore net of corporate income tax, i.e. $i = p \times (1 - \mu_{CIT}) \times r + (1 - p) \times \delta$ where μ_{CIT} is the average marginal corporate income tax rate, p is the proportion of assets invested in domestic equity, r is the pre-tax rate of return on domestic equities and δ is the rate of return on other asset classes.³⁰ In the absence of tax-favoured pension plans (i.e. for the “TTE” tax benchmark), corporate income tax would be collected on the returns on investment from diverted savings. The additional corporate income tax revenues collected on the returns on investment from the total assets invested in the pension plan comes from non-diverted savings (i.e. the tax break and the new savings) and equals: $\mu_{CIT} \times p \times r \times (A_{t-1} - A'_{t-1})$. The net tax expenditure related to corporate income tax is the inverse of that expression.

$$CIT_t = -\mu_{CIT} \times p \times r \times (A_{t-1} - A'_{t-1}) \quad \text{Equation 8}$$

Finally, new savings lower consumption tax revenues during the accumulation period and increase consumption tax revenues during the retirement period. Considering μ_{VAT} as the

tax rate on consumption, the net tax expenditure related to consumption tax may be expressed as

$$VAT_t = \mu_{VAT} [\alpha(1 - \mu_C)C_t - ((1 - \mu_B)B_t - B'_t)] \quad \text{Equation 9}$$

The total net tax expenditure is therefore expressed as

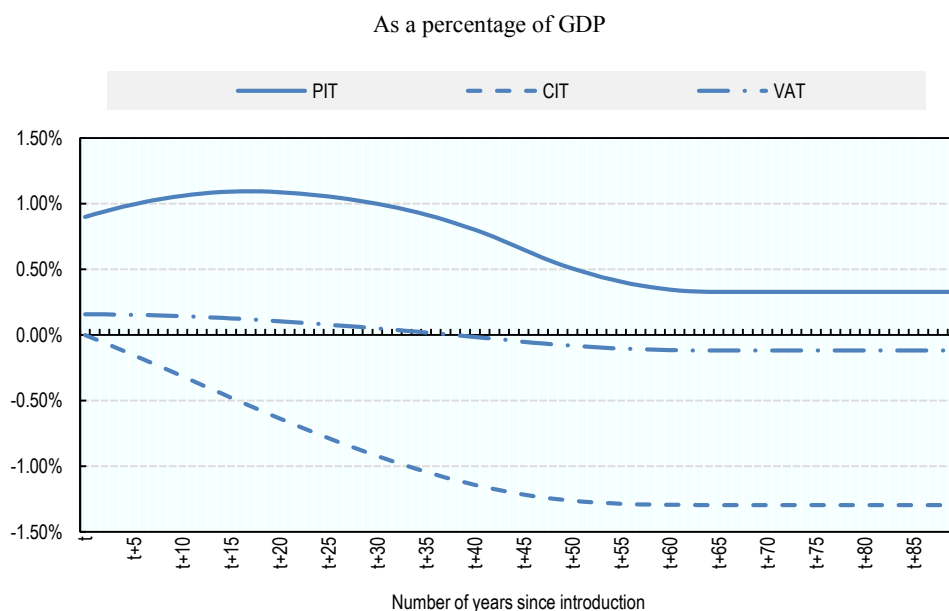
$$TNTE_t = \mu_C C_t + \mu_A i A'_{t-1} - \mu_B B_t - \mu_{CIT} \times p \times r \times (A_{t-1} - A'_{t-1}) + \mu_{VAT} [\alpha(1 - \mu_C)C_t - ((1 - \mu_B)B_t - B'_t)] \quad \text{Equation 10}$$

Total net tax expenditure

This section adjusts the simple and straightforward models of the net tax expenditure to account for the effect of corporate income tax and new savings. It assumes a pension system introduced in year t and maturing over time, using the same assumptions as in Section 5.2. In addition, the model assumes that the tax rates on personal income, corporate income and consumption are all equal to 30%, new savings represent 25% of all personal savings and the assets are fully invested in domestic equity.

Figure 5.8 displays how the three components of the total net tax expenditure (i.e. personal income tax revenues, corporate income tax revenues and consumption tax revenues) evolve over time when a pension system with an “EET” tax regime matures. As seen previously, the net tax expenditure related to personal income tax rises when contributions to the new pension system begin and then declines and converges to a steady state (cf. “PIT” line in Figure 5.8). The lag in the growth of benefits behind that of assets and investment income is what creates the temporary increase in the net tax expenditure.

Figure 5.8. Total net tax expenditure components: Maturing system model



Note: “PIT” means personal income tax, “CIT” means corporate income tax and “VAT” means consumption tax.

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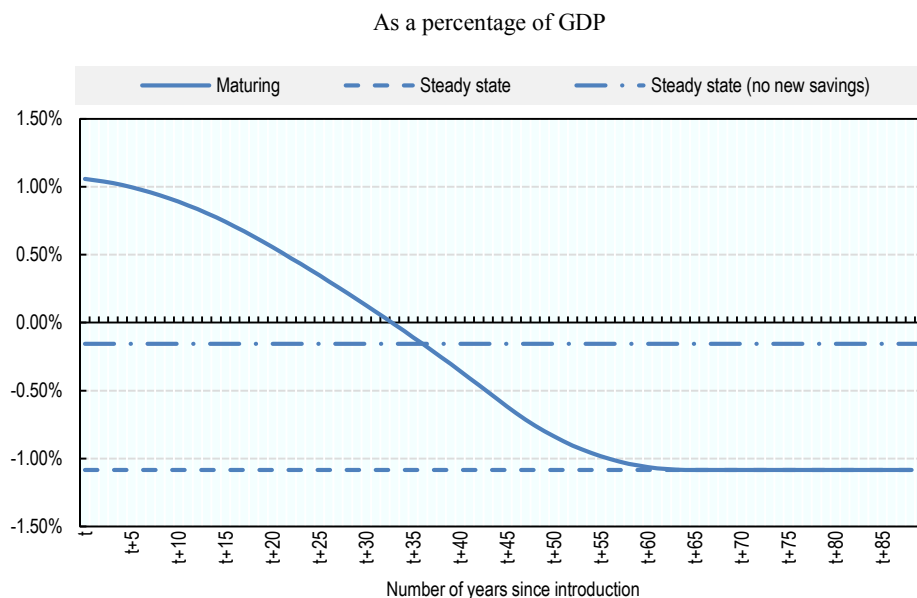
Assuming that part of the savings are new savings reduces the net tax expenditure, as compared with no new savings. For example, the steady-state net tax expenditure is equal to 0.66% of GDP in the absence of new savings (cf. Figure 5.2), and to 0.33% of GDP when assuming that new savings represent 25% of all personal savings (cf. “PIT” line in Figure 5.8). Indeed, the amount forgone on personal income tax revenues on accrued income is lower when part of the savings are new savings. This is because new savings would not have generated investment income in the absence of the tax-favoured pension plan. By contrast, new savings neither affect revenues forgone on contributions nor revenues collected on benefits.

Under the assumptions used here, the net tax expenditure related to corporate income tax is always negative. Non-diverted savings (i.e. the tax break and the new savings) generate additional accrued income (as compared to the tax benchmark) which is subject to corporate income tax. Corporate income tax revenues therefore increase in line with the development of the assets and investment income generated by these non-diverted savings, until reaching a steady state. In addition, corporate income tax revenues collected on accrued income are higher in the case of new savings (as opposed to no new savings) as non-diverted savings are then equal to the tax break plus the new savings. Higher non-diverted savings generate higher investment income, which is subject to corporate income tax.

Finally, the net tax expenditure related to consumption tax changes sign as the pension system matures. New savings in tax-favoured pension plans first generate consumption tax revenues forgone as new savings are financed by a decline in consumption. However, consumption tax revenues become higher than in the absence of new savings during retirement as benefits received (net of personal income tax) are larger than in the absence of the tax-favoured pension plan. This implies that new savings allow the Treasury to collect more consumption tax revenues (as compared to the tax benchmark) once the volume of benefits paid to retirees is high enough to offset the volume of new savings done by workers.

Combining the three components, the total net tax expenditure is higher at the onset of the system and declines to its steady state over time (Figure 5.9). The system attains full maturity and its steady-state level only in year $t+64$, the first year in which the 84-year-olds, who were aged 20 when the system was introduced, have contributed for their full career.

Under the assumptions used in this analysis, the total net tax expenditure reaches a negative steady state level of -1.08% of GDP (plain line in Figure 5.9). It becomes negative 33 years after the introduction of the pension system. However, whether the steady state is negative and the year in which the total net tax expenditure becomes negative is sensitive to the assumptions. For example, the steady-state level is negative at -0.16% of GDP in the case of no new savings (“long dash and dot” line in Figure 5.9).³¹ Alternatively, assuming that only 50% of the assets are invested in domestic equity (instead of 100%) gives a negative steady-state level of -0.32% of GDP.

Figure 5.9. Total net tax expenditure: Steady-state and maturing system models

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5.5. Conclusion

This chapter has examined the fiscal cost of tax and non-tax financial incentives for private pension plans and its evolution over the next 45 years in selected OECD countries. The main conclusions are the following:

- The tax treatment of private pension plans represents a significant fiscal cost in some countries but remains in the low single digits of GDP. This cost is mostly concentrated on high-income earners as these individuals participate more in tax-favoured retirement savings plans and pay the largest share of total taxes.
- Introducing a pension system with an “EET” tax treatment for retirement savings creates a larger net tax expenditure that comes upfront. It is only several decades later that the new pension system and its net tax expenditure reach a stationary situation.
- The maturing of the pension system and the ageing of larger cohorts can create substantial declines in the net tax expenditure level over time, but only from a level that is temporarily above a steady-state value that results from the introduction of the pension system or from the working years of larger cohorts.
- Countries should always expect a positive net tax expenditure from a tax treatment of retirement savings following an “EET” regime, including in the long-term. Even the maturing of the pension system and the ageing of larger cohorts may not be sufficient to reduce the net tax expenditure to zero or below zero, except when the amount of investment income generated in the year by personal savings is lower than the excess of benefits over contributions.
- Most of the private pension systems analysed in this document are still maturing, due to the recent introduction of the system (Latvia, Mexico and the Slovak

Republic), changes in contribution rates (Australia, Iceland, Latvia and the Slovak Republic) or past changes in coverage and contribution rates (Denmark). Depending on how far back these changes have taken place, the net tax expenditure may be in an increasing or decreasing trend. The ageing of the baby-boom cohorts is the other main driving factor for changes in the net tax expenditure (Canada, Denmark and the United States).

- Direct spending in the form of matching contributions or fixed nominal subsidies is modest compared to the net tax expenditure in Australia and Chile, while it represents an important component of the total fiscal cost related to private pensions in Mexico and New Zealand.
- Accounting for corporate income tax revenues and the effects produced by new savings would reduce the net tax expenditure arising from the tax treatment of private pensions.

Notes

¹ This means that the counterfactual scenario assumes that individuals continue saving the same amount in a non-tax favoured benchmark vehicle.

² The calculations for Canada have been undertaken by the Canadian Centre for Policy Alternatives and are not supported by the Canadian government. They only reflect tax expenditure for private pension plans and do not encompass the whole government tax-related support for retirement savings, in particular tax assistance on Canada Pension Plan (CPP) savings.

³ The net tax expenditure is calculated with respect to a “TTE” benchmark. This benchmark may differ from the one used in national tax expenditure reports.

⁴ The net tax expenditure adds to direct spending associated with non-tax financial incentives when relevant in order to estimate a total fiscal cost.

⁵ μ_C and μ_A represent the tax rates that apply respectively to contributions and returns in the benchmark tax regime, and that would apply to contributions and returns in the tax-favoured pension plan, would this plan stopped being tax-favoured. By contrast, μ_B represents the actual tax rate that applies to benefits paid by the tax-favoured pension plan.

⁶ In steady state, the value of k depends on contributions as a share of GDP (C_t/Y_t), i , g , and the duration of the contribution and pay-out periods.

⁷ The mechanisms are the same when assuming that the contribution rate increases.

⁸ As the model assumes that contributions are made at year-end, there is no investment income and no pension benefits in year t .

⁹ It also assumes constant demographics.

¹⁰ The steady-state level corresponding to the “EET” tax regime entails a long-term fiscal cost.

¹¹ Annex 5.A presents the methodology as well as country-specific assumptions used in the calculations.

¹² In addition, existing and proposed policy efforts are aimed at increasing participation in private pension plans in the future. These include automatic enrolment in defined contribution plans and state initiatives to boost retirement savings.

¹³ The calculations do not include the impact of the 2016-17 Budget measures and subsequent amendments. According to the Australian Treasury, these measures are expected to have a net effect of reducing the tax expenditure estimate.

¹⁴ The low income superannuation tax offset replaced the low income superannuation contribution as of 1 July 2017 and kept the same characteristics.

¹⁵ Based on data from the Pension Superintendence of Chile on average wage by age group, individuals aged between 35 and 69 would face a marginal income tax rate of 4%, while younger and older individuals would be tax exempt.

¹⁶ Investment income is taxed favourably as compared to traditional savings accounts (fixed rate of 15%).

¹⁷ It is already 15.5% for public sector employees.

¹⁸ The net tax expenditure related to voluntary pension savings (i.e. complementary contributions, short-term voluntary contributions, long-term voluntary contributions and special “saving for retirement” accounts) is negligible, below 1 basis point of GDP. The results are not shown but can be provided upon request.

¹⁹ The government used to kick-start every KiwiSaver accounts with a tax-free contribution of NZD 1 000. New members who joined on or after 21 May 2015 are not eligible for this payment. This contribution is therefore not taken into account.

²⁰ As explained in the annex, the model assumes that GDP grows in line with employed population growth and nominal productivity growth (1.25% real plus 2% inflation).

²¹ Participation was mandatory for new labour market entrants between 2005 and 2007. Then participation became voluntary until April 2012. From April 2012 until the end of 2012, new labour market entrants were automatically enrolled with an option to opt-out within 2 years. Participation became voluntary again since 2013, but once the individual has joined the system (before age 35), s/he cannot opt out.

²² The calculations do not include the fact that employer contributions are deductible from corporate income tax (up to 6% of the employee’s salary). The fiscal cost of exempting employer contributions is higher than the one related to the partial exemption of employee contributions (EUR 14 million vs. EU 1.3 million in 2015).

²³ Contributions are not tax deductible for individuals who opened a supplementary pension plan before 2014. The tax deductibility amount for those who opened their plan since 2014 is not indexed.

²⁴ The first individuals from these cohorts reached retirement age in 2011, while the last ones will enter retirement in around 2029.

²⁵ As seen in Section 5.2 (Figure 5.5), accrued income increases as larger cohorts build pension assets.

²⁶ Admittedly, lower consumption may also reduce economic growth and company profits.

²⁷ These social contributions are usually levied on gross salaries and wages to finance among others, health care insurance, unemployment insurance, public pensions and disability pensions.

²⁸ Although this effect is not explicitly taken into account in this analysis, it could be easily added by increasing the average marginal personal income tax rate applicable to contributions (μ_C) by the appropriate social contribution rate.

²⁹ This applies also when assets are invested in corporate bonds. For simplicity of presentation, the analysis focuses on domestic equity.

³⁰ For simplification, the analysis further assumes that $\delta = r$, so that $i = r \times (1 - \mu_{\text{CIT}} \times p)$.

³¹ As a way of comparison, the model in Section 5.2 (which also assumes no new savings, but only accounts for personal income tax) reaches a steady-state net tax expenditure of 0.66% of GDP. Accounting for corporate income tax therefore reduces significantly the steady-state level.

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Annex 5.A. Net tax expenditure: Methodology

This annex presents the approach used to project the future profile of the cost of tax incentives for private pensions, taking into account current and future contributions, asset accumulation and withdrawals, all of which will be strongly influenced by future demographic developments.

Methodological framework

Generating estimates of future costs and benefits arising from the tax treatment of retirement savings plans requires projecting forward a number of key variables including the number of contributors, total contributions, total assets, accrued income from assets, number of beneficiaries and withdrawals.¹ In each case, the total figure is obtained from aggregation across 13 heterogeneous 5-year age groups from ages 20 to 80+. They are calculated for each of the ten 5-year periods from 2015 to 2060, given initial conditions in 2015.² The projections also require estimates of relevant tax rates associated with each component of the net tax expenditure, as identified in Section 5.2.

Net tax expenditures at each period t are obtained as the net sum over all age groups g of the revenues forgone on contributions (RFC), revenues forgone on accrued income (RFAl) and revenues collected on withdrawals (RCW)

$$NTE_t = \sum_g RFC_t + \sum_g RFAl_t - \sum_g RCW_t \quad \text{Equation 11}$$

Revenues collected on withdrawals (RCW) are the product of the age-specific marginal income tax rates on withdrawals ($\mu_{B,g}$) and the amount withdrawn by each age group ($B_{t,g}$)

$$RCW_{t,g} = \mu_{B,g} B_{t,g} \quad \text{Equation 12}$$

In order to project forward withdrawals/benefits levels, it is necessary to project the total amount of assets, as benefits generally depend on total assets accumulated in private pension plans at the time of retirement.³ Assets for each age group ($A_{t,g}$) are determined according to the nominal pre-tax rate of return i on previous period assets, new contributions ($C_{t,g}$) and withdrawals ($B_{t,g}$)

$$A_{t,g} = (1 + i)A_{t-1,g} + C_{t,g} - B_{t,g} \quad \text{Equation 13}$$

Withdrawals are modelled based on the assumption that the total amount of assets accumulated until the age of 65 (or 60, depending on the country) is run down according to a constant annuity formula until full exhaustion at the age of 85.

$$A_{85} = 0, P_{84} = A_{84} \text{ and given that } P_t = P, \forall t$$

$$\Rightarrow P = \frac{1}{\sum_{j=1}^{20} (1+i)^j} \times A_{65} \times (1+i)^{20} \quad \text{Equation 14}$$

where P is the annuity payment.

As contributions can generally be deducted from taxable income, revenues forgone on contributions (RFC) made by each age group are the product of the age-specific marginal income tax rate on contributions ($\mu_{c,g}$) and the total amount contributed in age-group g , ($C_{t,g}$)

$$RFC_{t,g} = \mu_{c,g} C_{t,g} \quad \text{Equation 15}$$

In order to project forward the level of contributions, there is a need to project the number of contributors and the average contribution level per contributor. In turn, the number of contributors per age group in a given time period is determined by the number of individuals in employment in the age group multiplied by the participation rate in private pension plans. In addition, the average contribution level per participant in each age group can be expressed as a ratio of the economy-wide average wage. All in all, total contributions per age group in a given time period can therefore be expressed as

$$\begin{aligned} C_g &= \frac{C_g}{L_g} \times L_g = \frac{C_g}{L_g} \times \frac{L_g}{E_g} \times E_g \\ &= \left(\frac{C_g/L_g}{W/E} \right) \times \left(\frac{W}{E} \right) \times \left(\frac{L_g}{E_g} \right) \times E_g \end{aligned} \quad \text{Equation 16}$$

where E is the number of individuals in employment, L is the number of contributors, and W stands for nominal wages.

The ratio of average contribution level per participant in each age group to economy-wide average wage (first term in Equation 16) and the age-specific rates of participation in private pension plans (third term) are assumed to remain at their current level in the future. The average nominal wage in the total economy (second term) is assumed to grow at a constant rate. Finally, employment projections (fourth term) are based on labour force projections from the OECD Population and Labour Force Projections Database, combined with assumptions regarding the future evolution of unemployment rates.⁴

Forgone tax revenues on accrued income from investment (RFAI) measures taxes that would have been collected on investment income if private savings had been invested in a benchmark savings vehicle. It thus depends on the age-specific tax rates on accrued income from alternative savings ($\mu_{A,g}$), the nominal rate of return on assets (i), and the amount of assets accumulated ($A'_{t-1,g}$).

In contrast to the calculation of revenues collected on withdrawals, the relevant stock of assets in this case is not the total assets invested in the scheme ($A_{t-1,g}$) but only those accumulated from diverted savings. The reason for including only a subcomponent of total assets in the calculation of revenue losses on investment income is because not all contributions to retirement saving plans would have generated investment income in the absence of the retirement scheme. Contributions indeed comprise the tax break (forgone tax revenues on contributions), $\mu_c C_t$, and personal saving, $(1-\mu_c)C_t$. The latter can in turn be split into diverted savings, $(1-\alpha)(1-\mu_c)C_t$, and new savings, $\alpha(1-\mu_c)C_t$, where α is the share of personal savings financed by a decline in consumption (new savings). Since neither the new savings nor the tax break components would have generated investment

income in absence of the retirement scheme, they need to be excluded from the calculation of forgone tax revenues. Hence, the model requires a second asset accumulation equation based on diverted savings alone to determine forgone tax revenues on accrued income from investments

$$A'_{t,g} = (1+i)A'_{t-1,g} + (1-\alpha)(1-\mu_C)C_{t,g} - B'_{t,g} \quad \text{Equation 17}$$

Withdrawals $B'_{t,g}$ (which also differ from withdrawals used in Equation 13) are calculated as a constant annuity on accumulated assets from diverted savings, A' , at the age of 65 and fully exhausted by the age of 85. Forgone revenues on accrued investment income are thus determined by the age-specific tax rates on investment income multiplied by the return on assets accumulated from diverted savings

$$RFAI_{t,g} = \mu_{A,g} \times i \times A'_{t-1,g} \quad \text{Equation 18}$$

Substituting Equation 12, Equation 15 and Equation 18 into Equation 11 leads to the following relation for net tax expenditures

$$NTE_t = \sum_g \mu_{C,g} C_{t,g} + \sum_g \mu_{A,g} \times i \times A'_{t-1,g} - \sum_g \mu_{B,g} B_{t,g} \quad \text{Equation 19}$$

For those countries that tax accrued income in retirement saving plans (e.g. Denmark and Sweden), albeit at a usually favourable rate, $\mu'_A < \mu_A$, Equation 20 includes one extra term which captures tax revenues collected on the return to total assets accumulated

$$NTE_t = \sum_g \mu_{C,g} C_{t,g} + \sum_g \mu_{A,g} \times i \times A'_{t-1,g} - \sum_g \mu_{B,g} B_{t,g} - \sum_g \mu'_{A,g} \times i \times A_{t-1,g} \quad \text{Equation 20}$$

Key parameters

The relevant tax rates used to estimate revenues forgone on contributions and accrued investment income, as well as revenues collected on withdrawals are assumed to remain constant during the whole simulation. They are calculated based on a number of assumptions.

First, age-specific marginal tax rates are determined according to the age-specific average income in 2015. Average income by age group comes from the OECD Employment database. The average income is compared to the country-specific income tax brackets in 2015 to choose the appropriate marginal tax rate. In all countries where contributions to private pension plans are deductible from taxable income, these effective marginal tax rates measure the tax revenue forgone on a unit of contribution.

Second, the current tax treatment of traditional savings accounts in each country is taken as the benchmark tax system. In all cases, this is some version of the comprehensive income tax regime (“TTE”). Detailed information on the tax treatment of these traditional savings accounts is used to derive tax rates on the return on investment.

Third, given the lack of sufficient information about the overall income of private pension beneficiaries, the general rule has been to set the tax rate applied on benefit withdrawals from private pensions equal across all retired age groups ($\mu_{B,g} = \mu_B \forall g$) at 5 percentage points below the marginal tax rate of the average earner. A proper calculation would require adequate information about the level and the various sources of taxable income of

pensioners who have participated in a private pension scheme. These can be quite different from the average level and sources of taxable income of all pensioners. On the one hand, if benefits from private pension schemes were the sole source of taxable income, then the appropriate rate applied to measure revenues collected on withdrawals would be the average tax rate corresponding to the value of the annual benefit withdrawn. In practice, however, most recipients of private pension benefits usually receive income from various other taxable sources, in which case applying the average tax rate corresponding to the level of private pension benefits would most certainly underestimate the amount of tax revenues recovered. On the other hand, applying the corresponding marginal tax rate would most likely lead to overestimate the tax revenues, if only because pensioners generally benefit from special tax rebates and other benefits. On balance, a 5-percentage point reduction probably represents in most countries a conservative spread, in particular in those with steep tax schedule.⁶

Finally, the pre-tax nominal rate of return on assets is set at 5.06% per annum, including 2% inflation. Annex Table 5.A.1 presents the broad set of key assumptions made to generate the base case projections.

Annex Table 5.A.1. Main assumptions for the projections

Parameter	Value
Productivity growth	1.25%
Inflation	2%
Real rate of return	3%
Real discount rate	3%
Share of individual contributions that are new savings	0%

Country-specific assumptions

The following assumptions apply to the countries covered by the analysis.

Australia

The analysis covers both concessional and non-concessional contributions to the superannuation system.

The maximum amount for the low-income superannuation tax offset and for the super co-contribution (AUD 500 each) is assumed to remain constant going forward.⁷

As pension benefits by age are not available for 2015, the analysis assumes that the minimum age of withdrawal is 60 and that the distribution of benefits by age is the same as the distribution of individuals by age in the total population.

The calculations do not include the impact of the 2016-17 Budget measures and subsequent amendments. According to the Australian Treasury, these measures are expected to have a net effect of reducing the tax expenditure estimate.

Canada

The analysis covers Registered Pension Plans (RPPs), Registered Retirement Savings Plans (RRSPs), Pooled Registered Pension Plans (PRPPs) and Registered Retirement Income Funds (RRIFs).

Chile

The analysis covers the mandatory pension system only. Voluntary contributions are not taken into account.

The minimum wage is assumed to be indexed to wages, so that the maximum amount for the matching contribution for young workers and the subsidy for mothers also grow in line with wages.

Denmark

The analysis covers all pension plans for which an “EtT” tax regime applies (i.e. ATP and quasi-mandatory occupational plans). It therefore excludes “age savings” plans, for which a “TtE” tax regime applies.

Iceland

The analysis covers mandatory occupational pension plans only (pillar 2). Voluntary personal pension plans (pillar 3) are not taken into account as the distribution of assets by age is not available.

Data on total contributions and total assets by age are not available. Total assets were approximated using accrued liabilities for a sample of pension funds. Total contributions for 2015 were approximated assuming a weighted average total contribution rate of 12.24% and using the distribution of employee contributions by age.

All benefits paid are assumed to be retirement income (i.e. no disability and survivor’s pensions).

Latvia

The analysis covers the mandatory funded pension scheme only. Voluntary private pension funds are not taken into account as the distribution of contributions by age is not available.

The distribution of contributors by age is not available, but the distribution of participants by age is. The analysis assumes that the proportion of deferred members (those not paying pension contributions) is constant across age groups (21.8% in 2015).

Benefits paid by age are not available. The analysis assumes that the money transferred at retirement from the funded scheme to the pay-as-you-go scheme is instead run down according to a constant annuity formula until full exhaustion at the age of 85.

Mexico

The analysis covers mandatory individual retirement accounts and some voluntary pension savings (i.e. complementary contributions, short-term voluntary contributions, long-term voluntary contributions and special “saving for retirement” accounts). It excludes solidarity savings, as well as occupational and personal pension plans, for which detailed data broken down by age are not available for all variables. The results for voluntary pension savings are not shown but can be provided upon request.

The maximum amount for the social quota is assumed to be inflation indexed.

Returns on complementary contributions and short-term voluntary contributions are assumed to be taxed yearly instead of upon withdrawals.

The analysis assumes that withdrawals occur from the age of 60 years old.

The analysis assumes that the benefits received from mandatory individual retirement accounts are not taxed due to the exemption limit of 15 times the annual minimum wage. This exemption applies to the sum of all pension payments or benefits paid by the federal government, by pension funds, by occupational pension plans and by personal pension plans. However, only a minority of workers receive pension payments from different schemes and are likely to receive a total pension income that exceeds the tax-exemption limit. This assumption may therefore underestimate tax revenues collected on withdrawals and overestimate the net tax expenditure.

The assumed productivity growth rate of 1.25%, which is common for all 10 countries, is high in the context of Mexico (0.76% in recent years).

New Zealand

The analysis covers the KiwiSaver system only. Other superannuation plans are not taken into account.

Data on total assets by age are not available. The analysis approximates the distribution of total assets by age in 2015 by taking into account the fact that KiwiSaver started in 2007 and assuming a contribution rate of 7.5% (3% from the employee, 3% from the employer and 1.5% from the state – “member tax credit”).

As the maximum amount for the government matching contribution has been divided by two in 2011 and has remained at the same level since then, the analysis assumes that it will stay at NZD 521.43 for the next 45 years.

The analysis assumes that the assets are withdrawn as a lump sum at age 65.

Slovak Republic

The analysis covers the individual retirement accounts system (pillar 2) and supplementary pension plans (pillar 3).

Participation in individual retirement accounts by age is assumed to be dynamic rather than mirroring the distribution in 2015. The model assumes that the participation rate in 2060 will be around 40% of the labour force.

The tax deductibility of employee voluntary contributions in their individual retirement account was temporary, from 1 January 2013 until 31 December 2016. The analysis assumes that this measure will continue in the future. The impact on the results is however very negligible as the proportion of voluntary contributions in total pillar 2 contributions was 0.26% in 2015 and 0.29% in 2016.

The analysis assumes that the tax-deductibility limit for employee contributions into supplementary pension plans (EUR 180) is not indexed.

Contributions are not tax deductible for individuals who opened a supplementary pension plan before 2014. These individuals represented 85% of all participants in 2015 and their share is assumed to decline, such that by 2060 all participants have a plan opened from 2014.

Returns on investment are taxed upon withdrawal for supplementary pension plans. The analysis therefore calculates tax revenues forgone on accrued income during the accumulation phase and tax revenues collected on accrued income just before getting

pension benefits (using an approximation of the share of accrued income in total assets at age 65).

United States

The analysis covers voluntary occupational and personal plans. It only takes into account the net tax expenditure for the federal government (income taxation at state levels is not included).

The breakdown of the different relevant variables by age is approximated using the 2013 Survey of Consumer Finances. The analysis applies the distribution by age to the aggregated numbers from the OECD Global Pension Statistics database.

Notes

¹ The calculations use the number of contributors rather than the number of active members in private pension plans to project future contribution levels.

² Unlike the models in Section 5.2, the simulation is done with a five-year pace, rather than one-year. This is because demographic projections are only available with a five-year pace.

³ In the case of defined benefit pension plans, the analysis assumes full-funding (i.e. total assets are equal to total liabilities). As an approximation, benefits can also be considered to depend on assets accumulated at retirement.

⁴ Unemployment rates are assumed to converge to their long-term equilibrium level (non-accelerating inflation rate of unemployment), as published in the OECD Economic Outlook.

⁵ Diverted accrued income is equal to the proportion of diverted savings multiplied by the total accrued income (i.e. $i \times A'_{t-1,g} = (1 - \alpha)(1 - \mu_c) \times i \times A_{t-1,g}$).

⁶ Two factors could contribute to a wider spread. One is the possibility in many countries to withdraw benefits in the form of a lump sum, which in some cases is treated more leniently from a tax standpoint. The other factor, which is more relevant for European Union countries, concerns the possibility for pensioners to migrate to a lower tax country. On the other hand, some pensioners could face very high marginal rates if they lose means-tested benefits as they withdraw pension benefits.

⁷ The low income superannuation tax offset replaces the low income superannuation contribution as of 1 July 2017 and keeps the same characteristics.

Chapter 6. Assessing alternative approaches to designing financial incentives to promote savings for retirement

This chapter first describes the main features of the most common approach currently used by countries to promote savings for retirement, which taxes only pension benefits and exempts contributions and returns on investment. The chapter then assesses alternative approaches to designing financial incentives using a theoretical framework to see whether they would improve on the current main approach. The analysis measures improvement through the tax advantage that people may get over their lifetime when saving for retirement, and through the fiscal cost for the treasury.

The landscape of financial incentives to promote savings for retirement is changing. Historically, tax incentives were the most common type of financial incentive to promote savings for retirement, in particular the one deferring taxation to the retirement phase, taxing individuals only on their pension benefits (“EET”). This is still the main approach currently implemented, but recent developments are changing the landscape of financial incentives to promote savings for retirement. These include matching contributions, fixed nominal subsidies, or providing tax credits rather than tax deductions. These alternative approaches to designing financial incentives may alter the tax advantages that individuals get when saving in funded pension arrangements instead of in traditional savings vehicles, the relationship between tax advantage and income, and the fiscal cost for the treasury.

This chapter provide a theoretical assessment of alternative approaches to designing financial incentives to promote savings for retirement to see whether they would be an improvement on the current main “EET” approach. The analysis measures improvement through the tax advantage that people may get over their lifetime when saving for retirement, and through the fiscal cost for the treasury, relative to the tax advantage and fiscal cost of the current main approach based on taxing only pension benefits and exempting contributions and returns on investment. It uses a theoretical framework and illustrative cases to conduct the comparison, abstracting from country-specific parameters. This chapter does not cover other potential ways of assessing improvements on the current main approach to providing incentives, such as measuring whether alternative approaches achieve better participation rates, higher contribution levels, or higher national savings.

The best approach to designing financial incentives to promote savings for retirement depends on the intended policy objective. When the policy objective is to provide a similar tax advantage across income groups, policy makers can consider using tax credits, tax deductions at a fixed rate or matching contributions combined with tax incentives. These approaches increase the attractiveness of saving for retirement for middle to low-income groups, while reducing it for high-income earners, compared to the current main approach of taxing only withdrawals. When willing to target the tax advantage specifically at low-income earners, non-tax financial incentives (fixed nominal subsidies and matching contributions) and tax credits expressed as a fixed nominal amount are appropriate approaches. The assessment of the impact of difference approaches to designing financial incentives on the fiscal cost needs to differentiate between the short term and the long term impacts. Some approaches may indeed temporarily reduce the fiscal cost but end up costing more in the long term than the current main approach of only taxing withdrawals. Tax incentives designed in such a way that pension benefits are taxed tend to achieve comparatively lower fiscal costs than other approaches in the long term. Finally, no alternative approaches to designing financial incentives can improve on the current main approach of taxing only withdrawals by simultaneously providing higher tax advantages to individuals at a lower long-term fiscal cost.

The chapter proceeds as follows. Section 6.1 describes the main characteristics of the most common approach used currently by countries to promote savings for retirement, based on the tax advantages it provides to individuals and the cost it represents for the treasury. Section 6.2 lists alternative approaches to designing financial incentives and builds illustrative cases representing the most relevant approaches on which the comparative analysis in subsequent sections is based. Section 6.3 compares the tax advantage provided by alternative approaches, while Section 6.4 examines their fiscal cost. Section 6.5 includes a summary discussion and concludes.

6.1. Main characteristics of the most common approach to designing financial incentives

This section describes the most common approach used currently by countries to promote savings for retirement based on the tax advantages it provides to individuals and the cost it represents to governments.

Tax incentives tend to be the main type of incentive provided by governments to promote savings in funded pension arrangements. Tax incentives come from a differential tax treatment applied to funded pension arrangements as compared to other savings vehicles. In most countries, the “Taxed-Taxed-Exempt” (“TTE”) tax regime applies to traditional forms of savings, with contributions paid from after-tax earnings, the investment income generated by those savings taxed and withdrawals exempted from taxation. When the tax regime applied to funded pension arrangements deviates from the “TTE” tax regime, this could lead to a reduction in taxes paid over the individual’s lifetime.

As shown in Chapter 2, the most common tax treatment of retirement savings exempts contributions (i.e. they are deductible from taxable income) and returns on investment from taxation, while it taxes pension benefits and withdrawals as income. Half of the OECD countries apply a variant of this “Exempt-Exempt-Taxed” (“EET”) tax regime to retirement savings.

The overall tax advantage provided by the “EET” tax regime, as compared to a “TTE” benchmark, is essentially equivalent to exempting returns on investment from tax. Figure 6.1 shows the overall tax advantage provided by the “EET” tax regime (crosses) broken down by components (tax advantage on contributions, tax advantage on returns and tax advantage on withdrawals) for different levels of income. The overall tax advantage represents the present value of taxes saved by an individual over his/her working and retirement years when contributing the same amount (before tax) to a pension plan instead of to a benchmark savings vehicle. It is expressed as a percentage of the present value of pre-tax contributions.¹ When tax rates are the same at the time of contribution and withdrawal (left panel of Figure 6.1), the initial tax relief on contributions is exactly compensated by the tax paid on withdrawals, regardless of the income of the individual saver. The overall tax advantage therefore comes solely from the exemption from taxation of returns on investment. Moreover, the after-tax rate of return is equal to the before-tax rate of return and the tax regime provides neutrality between saving and consuming to all individuals (cf. Chapter 3).

The link between the overall tax advantage provided by an “EET” tax regime and the income level of the individual depends on the structure of the personal income tax system. In countries where all individuals have their entire income taxed at a fixed rate, the overall tax advantage provided by the “EET” tax regime (and any other tax regime) is the same across the income scale. When personal income tax rates increase with taxable income, the overall tax advantage increases with income through higher marginal tax rates. Indeed, individuals with higher marginal tax rates benefit more on every unit of investment income to which a zero rate of tax applies. However, the amount of investment income that would have been generated by an after-tax contribution in a benchmark “TTE” savings account is lower for individuals with higher marginal tax rates. The result is that the overall tax advantage increases with marginal tax rates, but the rate of increase slows as the marginal tax rate increases (Brady, 2012^[1]). This is illustrated in the left panel of Figure 6.1.

Figure 6.1. Overall tax advantage for an “EET” tax regime, by income level and components

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions

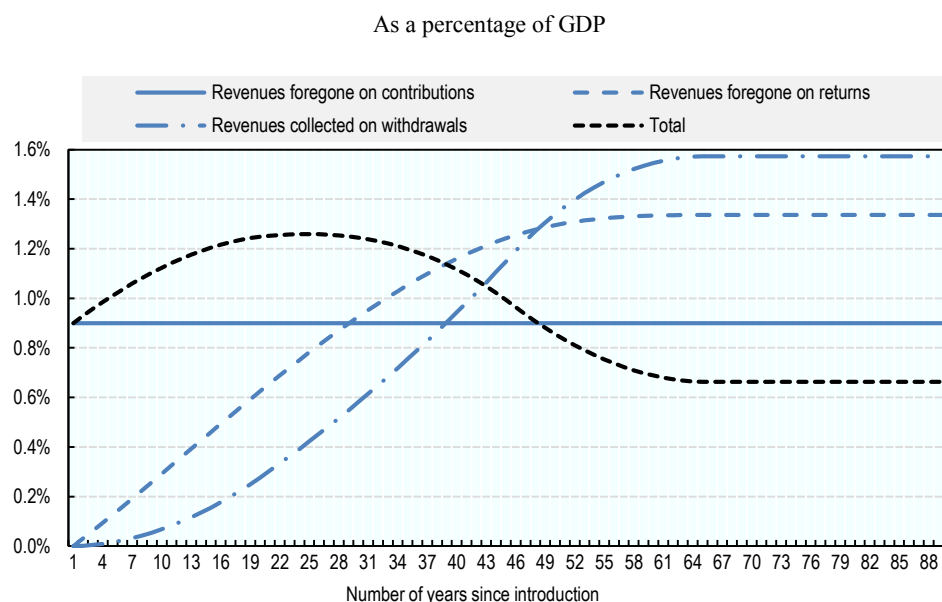


Note: The calculations assume an individual contributing 5% of wages from age 20 to 64 and withdrawing benefits from age 65 to 84 as a fixed-payment annuity. Personal income falls into five tax brackets with tax rates of 0%, 14%, 30%, 41% and 45% respectively. On the left panel, each individual remains in the same tax bracket over working and retirement years. On the right panel, the tax rate during retirement is defined according to the level of taxable pension income (including public pensions).

StatLink  <http://dx.doi.org/10.1787/888933850963>

The relative level of retirement income compared to income from work also affects the link between the overall tax advantage provided by the “EET” tax regime, and the level of income. Retirement income is usually lower than income from work hence the former is likely to be taxed at a lower average rate than the latter. In that case, the tax paid on withdrawals may not compensate fully for the initial tax relief on contributions and the overall tax advantage is larger. This also means that the tax regime may favour saving over consuming in particular for middle to upper-middle income earners (the after-tax rate of return is greater than the before-tax rate of return). In addition, depending on the distance between the tax rates in the different tax brackets, and the size of the tax brackets, the reduction in taxes paid on withdrawals may increase the distance in the overall tax advantage across income groups. The right panel of Figure 6.1 shows that the overall tax advantage increases significantly for individuals earning between 80% and 2 times the average earnings when they face lower tax rates during retirement than while working. For high-income earners, there is a convergence towards tax neutrality because the higher is the income, the less likely is the individual to experience a fall in tax rate at retirement.

Finally, “EET” tax incentives generate a long-term fiscal cost to the government. Figure 6.2 presents projections of the net tax expenditure level of a funded pension arrangement with an “EET” tax regime since its introduction. The net tax expenditure incurred by an “EET” arrangement, with respect to a “TTE” benchmark, is the sum of tax revenues forgone on contributions, tax revenues forgone on returns and taxes collected on withdrawals. The lag in the growth of benefits behind that of assets and investment returns is what creates the temporary increase in the net tax expenditure level. As the density of contributions progresses, asset and investment return levels grow and so, with a lag, do benefit levels.

Figure 6.2. Net tax expenditure for a maturing “EET” pension system, by components

Note: The calculations assume that individuals save from the age of 20 to 64 and draw pension benefits from age 65 to 84; contributions represent 3% of GDP; the number of people in each single-year age cohort is equal; the same average tax rate (30%) applies to all sources of income; a nominal rate of return of 5.06% (3% real return plus 2% inflation); and GDP growth at 3.28% (1.25% real growth plus 2% inflation).

StatLink  <http://dx.doi.org/10.1787/888933850982>

Once the pension system is mature however, taxes collected on withdrawals are large. When all retirees draw their pension based on a full career and constant contribution rules, the net tax expenditure stabilises at its steady-state level. This level is characterised by the fact that the size of withdrawals in a given year exceeds the size of contributions, as withdrawals are the result of several years of contributions accumulating with compound interests. Taxes collected on withdrawals each year therefore more than compensate for tax revenues forgone on contributions.² For countries already using the “EET” tax regime that are entering into a demographic transition in which the population is ageing, the higher tax revenues will come at a time when pressure on public services may increase.

6.2. What are the alternative approaches to designing financial incentives?

This section identifies alternative approaches to designing financial incentives to promote savings for retirement and builds illustrative cases that will help compare different approaches in the subsequent sections.

There are other tax regimes than the one taxing only withdrawals (“EET”) in OECD countries to promote savings for retirement. Chapter 2 shows that a broad range of tax regimes apply to retirement savings, from the “Exempt-Exempt-Exempt” (“EEE”) tax regime where contributions, returns on investment and pension income are all tax-exempt, to regimes where two of three flows of income are taxed.

The tax treatment of the different flows (contributions, returns on investment and withdrawals) can be somewhere in between the two opposite cases of full taxation and

full exemption. Three examples taken from Canada, Australia and France illustrate this for each of the respective flows. In Canada, pension contributions are deductible from income, but only up to a nominal ceiling, which means that contributions above the ceiling are not tax deductible. In Australia, returns on investment are taxed at the fixed rate of 15% in the accumulation phase, but for many taxpayers this rate is lower than their marginal rate of personal income tax. This means that, for many people, the tax rate applied to returns in superannuation funds is lower than the one applying to returns generated in other savings vehicles. Finally, in France, pension benefits paid as annuities are treated as taxable income after a 10% deduction. The examples illustrate how partial tax relief and partial taxation are possible for the three types of flow.

Partial tax relief on contributions is widespread and can take several forms:

- **Ceiling on tax deductibility:** Contributions are tax deductible up to a nominal ceiling. Contributions above the ceiling are not tax deductible and are therefore taxed at the individual's marginal income tax rate. Most countries have ceilings on tax-deductible contributions.
- **Partial tax deductibility:** Only a portion of the contributions is tax deductible. For example, in Portugal, 20% of an individual's contributions to private pension plans are tax deductible. Like with the "EET" tax treatment, the partial tax deductibility reduces an individual's taxable income. The reduction therefore applies at the individual's marginal income tax rate.
- **Deduction at fixed rate:** Contributions are tax deductible at the same fixed rate for everyone, independently of the individual's marginal income tax rate. This approach is discussed as an alternative to tax deduction at the individual's marginal income tax rate in some countries, like the United Kingdom, but is not implemented in any country yet.
- **Deduction at capped rate:** Contributions are tax deductible at the individual's marginal income tax rate, as long as that marginal rate is below a cap rate. For individuals with a marginal rate above the cap, contributions are deductible only at the capped rate. This approach is not implemented in any country yet.
- **Non-refundable tax credit:** Contributions are not tax deductible but the individual receives a tax credit that reduces the amount of personal income tax due. The value of the tax credit can be calculated as a percentage of contributions (e.g. Belgium, Estonia, Finland, Israel and Korea) or as a fixed nominal amount (this approach is common for mortgages but it is not implemented in any country yet for retirement savings). The fact that the tax credit is non-refundable means that the value of the tax credit cannot exceed the personal income tax liability.
- **Fixed tax rate:** Contributions are taxed at the same fixed rate for everyone. For example, in Australia, pension contributions are taxed at the fixed rate of 15%.³ As this rate is usually lower than the marginal income tax rate, most individuals benefit from a tax rate relief on their contributions.

Non-tax financial incentives in the form of matching contributions and fixed nominal subsidies are increasingly popular. Non-tax financial incentives are payments made by the government directly in the pension account of eligible individuals, thus increasing the assets accumulated to finance retirement. Research shows that understanding around tax relief is low among low-income individuals, who also tend to consider tax incentives as a secondary determinant in their decision to save (Sandler, 2002^[2]; Clery, Humphrey and

Bourne, 2010^[3]; Kempson, McKay and Collard, 2003^[4]). Policy makers in some countries therefore offer non-tax financial incentives to encourage low-to-middle income individuals to save for retirement.

Matching contributions are usually conditional on the individual contributing and correspond to a certain proportion of the individual's own contributions, up to a nominal ceiling. The match rate paid by the government varies greatly across countries, from 4.25% in Austria to 325% in Mexico (programme for civil servants).⁴ A match rate of 50% can be found in Australia, where the matching contribution is targeted at low-income individuals, and in New Zealand, where it applies to all plan members.

Fixed nominal subsidies are designed to attract low-income individuals as the fixed amount paid into the pension account by the government represents a higher share of their income. They can be found in Chile, Germany, Lithuania, Mexico and Turkey.

Non-tax incentives may be used as a substitute or as a complement to tax incentives. For example, in Australia, the super co-contribution is a government matching contribution for low-income individuals making a voluntary contribution to their superannuation fund. This voluntary contribution is made from after-tax income, i.e. from money on which the individual has already been taxed at his/her marginal rate. In that case, the matching contribution comes as a substitute for any tax relief on contributions. By contrast, in the case of Riester pension plans in Germany, high-income individuals can cumulate the fixed nominal subsidy with tax deductions of contributions (although the amount that can be deducted is reduced by the value of the subsidy). There, both types of incentive complement each other.

The analysis in the next sections uses illustrative cases of the different alternative approaches to designing incentives to promote retirement savings discussed above. The selected illustrative cases are presented in Box 6.1. They can be split into three groups: alternative tax incentives to the “EET” tax regime, non-tax incentives and approaches to providing partial tax relief on contributions. Regarding non-tax incentives, the analysis assesses matching contributions and fixed nominal subsidies as a substitute for tax incentives, not as a complement. Therefore, the underlying tax regime applying to retirement savings under non-tax incentives approaches is the same one as for traditional savings vehicles (i.e. “TTE”). This allows examining the specificities of non-tax incentives as compared to tax incentives. Fixed nominal subsidies and matching contributions are treated as refundable tax credits paid into the pension account.

6.3. How does the tax advantages provided by alternative approaches to designing financial incentives compare with the one provided by the current main approach?

This section compares the tax advantage provided by alternative approaches to designing financial incentives to the one provided by the current main “EET” approach. The section starts by comparing different alternative tax and non-tax incentives and then compares different approaches to providing partial tax relief on contributions.

All the comparisons are done in a theoretical framework and using the illustrative cases presented in Box 6.1 to abstract from country-specific parameters and understand the specific characteristics of each alternative approach. The analysis assumes five personal income tax brackets with tax rates of 0%, 14%, 30%, 41% and 45% respectively. During retirement, the tax due is determined according to the level of total taxable pension income (including public pension).

Box 6.1. Selected illustrative cases of alternative approaches to designing financial incentives to promote savings for retirement

Alternative tax incentives

- “EEE”: contributions, returns and withdrawals are tax free
- “EtE”: contributions are tax deductible, returns are taxed at 15% and withdrawals are tax free
- “EtT”: contributions are tax deductible, returns are taxed at 15% and withdrawals are taxed at the individual’s marginal tax rate
- “TEE”: contributions are taxed at the individual’s marginal tax rate, returns and withdrawals are tax free
- “tEt”: 50% of contributions are tax deductible, returns are tax free and 50% of withdrawals are tax exempt
- “tE”: contributions and returns are taxed at 15% and withdrawals are tax free

Non-tax incentives

- Matching contribution: 50% match rate
- Fixed nominal subsidy: 1% of the average earnings in the economy

Approaches to provide partial tax relief on contributions

- Ceiling on tax deductibility
- Partial tax deductibility
- Deduction at fixed rate
- Deduction at capped rate
- Non-refundable tax credit (expressed as a percentage of contributions)
- Non-refundable tax credit (expressed as a fixed nominal amount)
- Fixed tax rate

Memo item: Tax treatment of traditional savings vehicles

- “TTE”: contributions and returns are taxed at the individual’s marginal tax rate and withdrawals are tax free

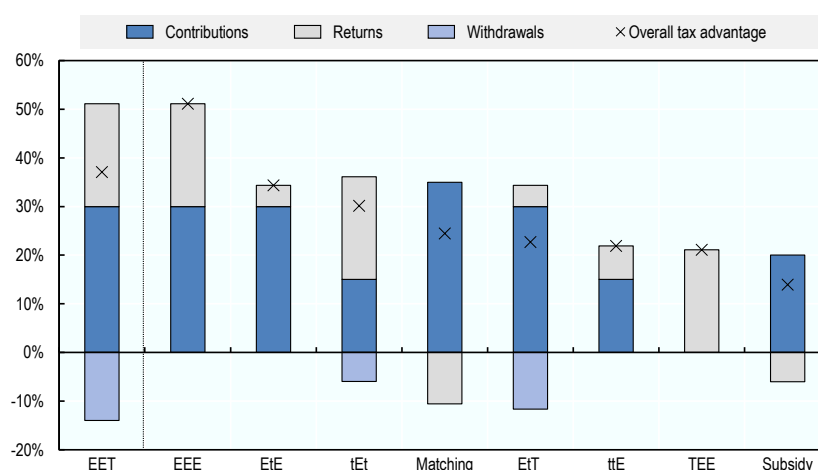
Alternative tax and non-tax incentives

Changing the design of financial incentives modifies the overall tax advantage provided to individuals when saving for retirement. Figure 6.3 compares the overall tax advantage provided by the current main approach of taxing only withdrawals (“EET”) to that of alternative tax and non-tax incentives. The overall tax advantage results from comparing each tax and non-tax incentive separately to the tax treatment of a benchmark traditional savings vehicle where contributions and returns on investment are taxed at the individual’s marginal tax rate and withdrawals are tax exempt (“TTE”). Approaches that exempt or tax contributions and returns on investment favourably while taxing withdrawals (“EET”, “tEt” and “EtT” tax regimes) provide an overall tax advantage that nets out a positive tax advantage on contributions, a positive tax advantage on returns and a negative tax advantage on withdrawals. Approaches that exempt or tax favourably contributions and returns on investment while exempting withdrawals provide an overall tax advantage that results from a positive tax advantage on contributions and a positive tax advantage on returns (“EEE”, “EtE” and “tE” tax regimes).⁵ The tax advantage when

retirement savings are taxed upfront (i.e. only contributions are taxed, “TEE”) comes from the tax exemption of returns on investment. Finally, non-tax incentives provide an overall tax advantage that result from a positive tax advantage on contributions and a negative tax advantage on returns. This negative tax advantage on returns is due to the fact that non-tax incentives increase the amount contributed to the pension plan, thereby increasing investment income and the tax due on it, as compared to the benchmark traditional savings vehicle.

Figure 6.3. Overall tax advantage for the “EET” tax regime and alternative tax and non-tax incentives, by components, average earner

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



Note: “E” stands for exempt, “T” for taxed and “t” for partial tax relief. The calculations assume an average earner contributing 5% of wages from age 20 to 64 and withdrawing benefits from age 65 to 84 as a fixed-payment annuity. See Box 6.1 for the detailed design of each incentive.

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The ranking of the different types of tax and non-tax incentive on the overall tax advantage for the average earner vary according to the assumptions used. For example, when assuming a 50% match rate, the matching contribution approach is less advantageous to the average earner than the “EET” tax regime, but both approaches would be equivalent with a 75% match rate. Assuming a 10% contribution rate instead of 5% would make the “EET” and “EtE” tax regimes equivalent in terms of overall tax advantage as higher contributions translate into higher pension income, which is taxed at a higher rate in the case of the “EET” tax regime. It is also worth noting that, independently of the assumptions chosen, and compared to the “EET” approach, removing the taxation of withdrawals (“EEE” tax regime) will always increase the tax advantage, while taxing returns on investment (“EtT” tax regime) will always reduce the tax advantage.

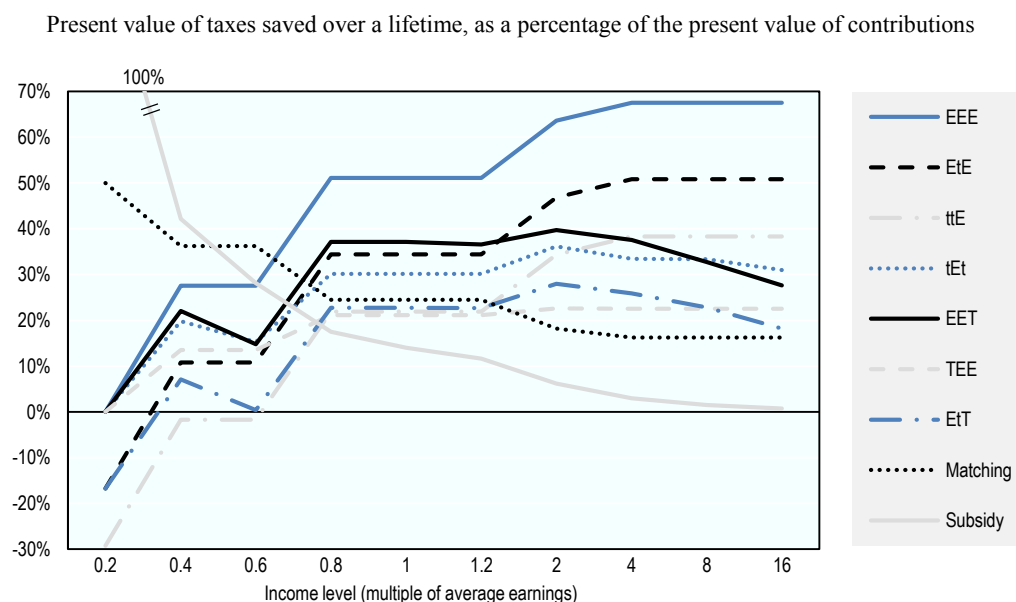
An individual whose income is subject to a lower marginal tax rate during retirement than while working is better-off when retirement savings are taxed upon withdrawal (“EET”) rather than taxed upfront (“TEE”). Figure 6.3 shows that “TEE” tax incentives provide a smaller overall tax advantage to the average earner than “EET” tax incentives. The tax advantage on returns is the same for both tax regimes (grey bars). However, with the “EET” tax regime, the tax advantage on contributions is not compensated fully by the tax

due on withdrawals when the individual's marginal income tax rate falls at retirement. The overall tax advantage is therefore larger than just the tax advantage on returns. Only individuals, whose income remains subject to the same marginal tax rate during retirement as while working, are neutral between the two approaches that tax retirement savings upfront versus upon withdrawal.⁶

Tax incentives provide an overall tax advantage that increases with income in systems where tax rates increase with taxable income. Figure 6.4 illustrates how the overall tax advantage changes with the level of the income for the current main approach to designing financial incentives (“EET”) and alternative tax and non-tax incentives. All of the tax incentives provide a larger overall tax advantage to individuals with higher earnings. This is because of the underlying tax system, in which tax rates increase with income. This type of tax system implies that any tax relief is given at a higher rate for individuals whose income reaches higher tax brackets.

By contrast, in tax systems where a fixed tax rate applies to the entire income of the individual, all tax incentives become income neutral, because any tax relief is given at the same rate for everyone.

Figure 6.4. Overall tax advantage for the “EET” tax regime and alternative tax and non-tax incentives, by income level



Note: “E” stands for exempt, “T” for taxed and “t” for partial tax relief. The calculations assume an average earner contributing 5% of wages from age 20 to 64 and withdrawing benefits from age 65 to 84 as a fixed-payment annuity. See Box 6.1 for the detailed design of each incentive.

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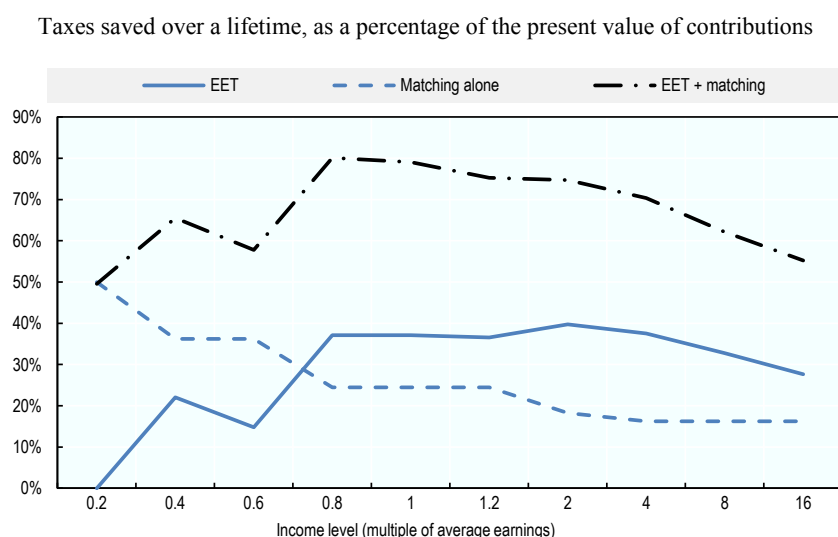
Non-tax incentives alone, when not associated with other tax incentives, provide a higher overall tax advantage to low-income earners in systems where tax rates increase with taxable income. This is not surprising for fixed nominal subsidies, but less intuitive in the case of matching contributions, as the match rate is equal for everyone. When the matching contribution is associated with the “TTE” tax regime, the match rate applies to

after-tax contributions, implying that individuals with higher marginal tax rates receive a lower tax advantage on their contributions. In addition, the tax due on returns increases with income because matching contributions increase the level of total contributions and generate additional investment income, compared to a traditional savings vehicle. Therefore the overall tax advantage provided by matching contributions declines with income.

In tax systems where a fixed tax rate applies to the entire income of the individual, matching contributions become income neutral, but fixed nominal subsidies remain more advantageous to low-income earners. Matching contributions provide the same advantage to all income groups in such tax systems because the match rate is the same for all, while contributions and returns on investment are taxed at the same rate for everybody. Fixed nominal subsidies provide a tax advantage that declines with the income level because the value of the subsidy is fixed.

Adding non-tax incentives to tax incentives increases the overall tax advantage provided to individuals, while achieving a smoother overall tax advantage across income groups. Figure 6.5 illustrates the impact on the overall tax advantage of adding non-tax incentives on top of existing tax incentives. For example, introducing a 50% matching contributions for a pension plan that is already subject to the “EET” tax regime would increase the tax advantage on contributions for all earners in the same proportion (equivalent to the match rate). At the same time, it would also increase assets accumulated, pension benefits and the amount of tax due on the latter. That increase in tax due on withdrawals would hit higher-income earners harder, as they are the ones subject to the highest marginal tax rates. All in all, the introduction of a matching contribution would increase the overall tax advantage for all individuals, but more so for low-income earners. The combination of the “EET” tax regime with a matching contribution therefore achieves a smoother the tax advantage across income groups than “EET” alone or matching contributions alone.

Figure 6.5. Overall tax advantage for tax and non-tax incentives alone or in combination, by income level



Note: “E” stands for exempt and “T” for taxed. The calculations assume an individual contributing 5% of wages from age 20 to 64 and withdrawing benefits from age 65 to 84 as a fixed-payment annuity. The tax system is such that tax rates increase with taxable income. A 50% match rate is assumed.

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Approaches to providing partial tax relief on contributions

Different approaches can be used to provide partial tax relief on contributions. To understand the mechanisms through which the different approaches operate, Table 6.1 presents the formulas that determine the after-tax contribution for each of them. For example, in the case of a deduction at fixed rate, the after-tax contribution is equal to the before-tax contribution minus the tax liability on the contribution. In turn, the tax liability is the amount that would have to be paid without tax relief (the before-tax contribution multiplied by the marginal tax rate) minus the tax deduction (the after-tax contribution multiplied by the fixed rate of deduction). Interestingly, the after-tax contribution is equal to the before-tax contribution when the rate of deduction is equal to the individual's marginal tax rate.

It is possible to design the different approaches in such a way that they will provide the same overall tax advantage to an individual. For example, an individual whose income is subject to a marginal tax rate of 30% will get the same overall tax advantage when deducting 50% of contributions; deducting contributions at a fixed rate of 15%; receiving a tax credit of 15%; or having contributions taxed at a fixed rate of 17.6%.

Table 6.1. Determination of the after-tax contribution for different approaches to providing partial tax relief on contributions

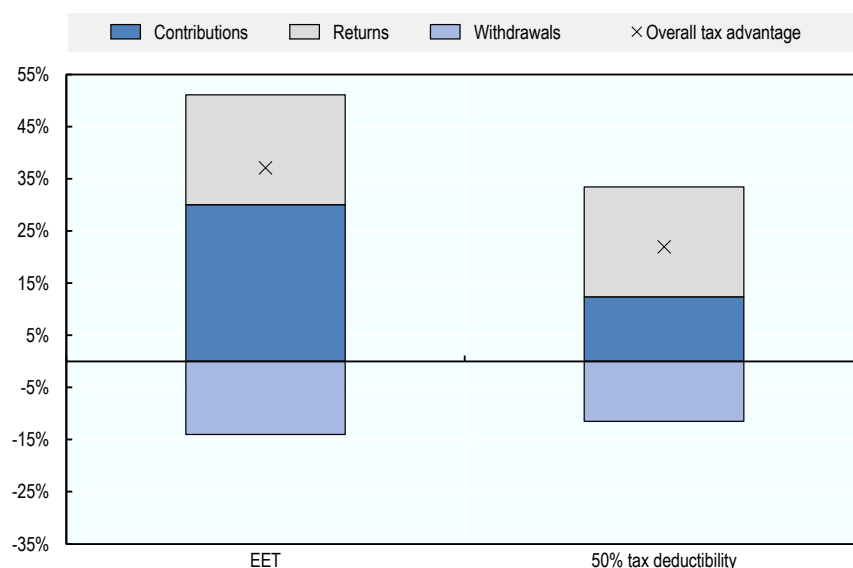
	Formula to determine the after-tax contribution
Ceiling on tax deductibility	$ATC = BTC - (BTC \times MTR - \min\{ATC, Ceiling\} \times MTR)$ If $ATC \leq Ceiling$: $ATC = BTC$ If $ATC > Ceiling$: $ATC = BTC \times (1 - MTR) + Ceiling \times MTR$ Where "Ceiling" is the maximum contribution that is deductible
Partial tax deductibility	$ATC = BTC - (BTC \times MTR - DP \times ATC \times MTR)$ $ATC = BTC \times \frac{1 - MTR}{1 - DP \times MTR}$ Where "DP" is the part of contributions that is deductible
Deduction at fixed rate	$ATC = BTC - (BTC \times MTR - ATC \times FRD)$ $ATC = BTC \times \frac{1 - MTR}{1 - FRD}$ Where "FRD" is the fixed rate of deduction
Deduction at capped rate	$ATC = BTC - (BTC \times MTR - ATC \times \min\{MTR, CRD\})$ If $MTR \leq CRD$: $ATC = BTC$ If $MTR > CRD$: $ATC = BTC \times \frac{1 - MTR}{1 - CRD}$ Where "CRD" is the capped rate of deduction
Tax credit (%)	$ATC = BTC - (BTC \times MTR - ATC \times TCR)$ $ATC = BTC \times \frac{1 - MTR}{1 - TCR}$ Where "TCR" is the tax credit rate
Tax credit (fixed amount)	$ATC = BTC - (BTC \times MTR - TCA)$ $ATC = BTC \times (1 - MTR) + TCA$ Where "TCA" is the tax credit amount
Fixed tax rate	$ATC = BTC \times (1 - FTR)$ Where "FTR" is the fixed tax rate

Note: "ATC"= after-tax contribution; "BTC"=before-tax contribution; "MTR"=marginal income tax rate.

When changing the tax relief on contributions from full tax deductibility to partial tax relief, the decrease in the tax advantage on contributions is partially compensated by a lower taxation of withdrawals.⁷ Figure 6.6 shows the decomposition of the overall tax advantage for the “EET” tax regime and the partial tax deductibility approach. Only one alternative approach is shown in the graph, as all the other approaches to providing partial tax relief on contributions operate through the same mechanism. A change in the tax treatment of contributions (without changing the tax treatment of returns on investment and of withdrawals) obviously has an impact on the tax advantage on contributions, but also on the tax advantage on withdrawals. For example, when only 50% of contributions are tax deductible, the tax advantage on contributions decreases from 30% of the present value of contributions for the “EET” tax regime to 12% for the partial deductibility approach. Meanwhile, the tax advantage on returns remains the same (21%) and the tax advantage on withdrawals increases (from -14% to -12%). Indeed, a reduction in the tax relief on contributions lowers the level of after-tax contributions paid in the pension plan, and as a consequence it also lowers the level of assets accumulated, the future level of pension benefits, and the amount of tax due on the latter.

Figure 6.6. Overall tax advantage for the “EET” tax regime and the partial tax deductibility

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



Note: “E” stands for exempt and “T” for taxed. The calculations assume an individual contributing 5% of wages from age 20 to 64 and withdrawing benefits from age 65 to 84 as a fixed-payment annuity.

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Among approaches to providing partial tax relief on contributions, a fixed tax rate on contributions favours high-income earners, while a tax credit expressed as a fixed nominal amount and a tax deduction at fixed rate favour low-income earners in systems where tax rates increase with taxable income. Figure 6.7 illustrates how the overall tax advantage changes with the level of income for the “EET” tax regime and different approaches to providing partial tax relief on contributions. The different approaches are defined so that the average earner gets the same overall tax advantage, which corresponds to deducting 50% of contributions. None of the approaches are income neutral.

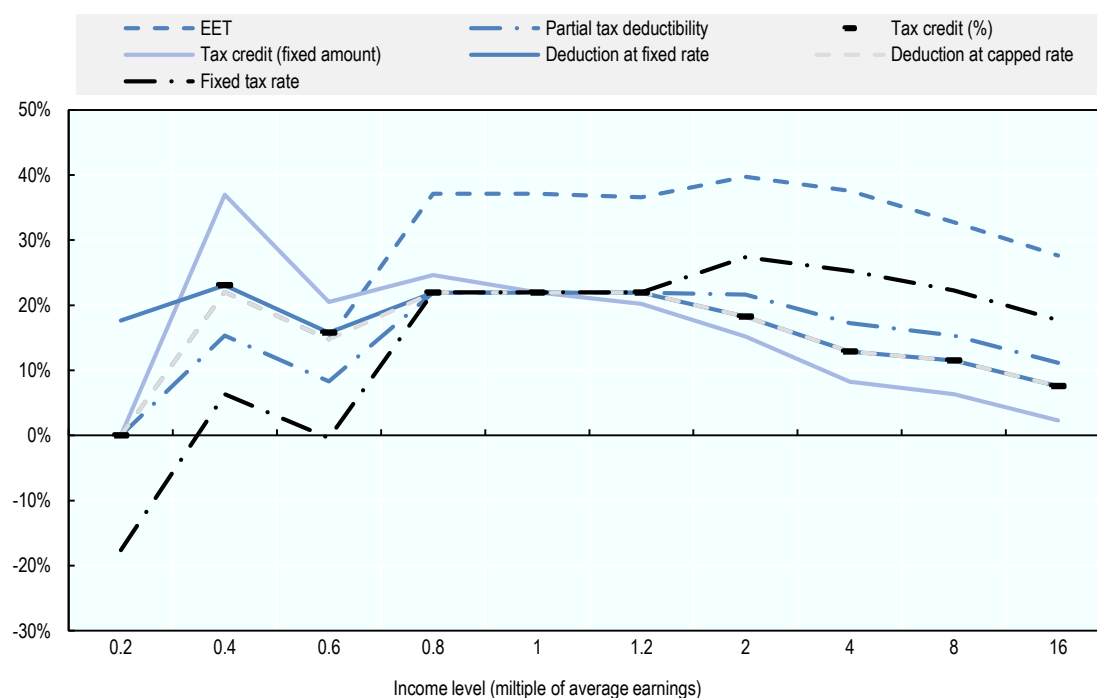
Reducing tax relief on contributions through partial tax deductibility lowers the overall tax advantage for all income groups, but hits middle- and high-income earners harder than low-income earners. As shown in Figure 6.7, the gap in the overall tax advantage between full tax deductibility (“EET”) and partial tax deductibility of contributions increases with income. Indeed, low-income earners are the ones who benefit the least from the “EET” tax regime in the first place, because they already pay little or no income tax before the deduction of contributions. Reducing the portion of contributions that can be deducted from taxable income therefore has a lower impact for low-income earners.

Tax deductions at a fixed rate increase the overall tax advantage for low-income earners and reduce it for high-income earners, thereby achieving a smoother relationship across income groups, compared to tax deductions at the marginal rate. Low-income earners are better-off with a deduction at fixed rate than with a deduction at their marginal rate when the fixed deduction rate is higher than their marginal income tax rate.

Tax credits expressed as a proportion of contributions are equivalent to tax deductions at fixed rate except for very low-income earners. Indeed, very low-income earners who pay little or no income tax benefit less from the tax credit because of its non-refundable nature. By contrast, they get an extra relief when their income is taxed at a rate below the fixed rate of deduction.

Figure 6.7. Overall tax advantage for the “EET” tax regime and different approaches to providing partial tax relief on contributions, by income level

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



Note: “E” stands for exempt and “T” for taxed. The calculations assume an individual contributing 5% of wages from age 20 to 64 and withdrawing benefits from age 65 to 84 as a fixed-payment annuity. The tax system is such that tax rates increase with taxable income. All the strategies are equivalent in terms of overall tax advantage for the average earner and correspond to the case where 50% of contributions are tax deductible.

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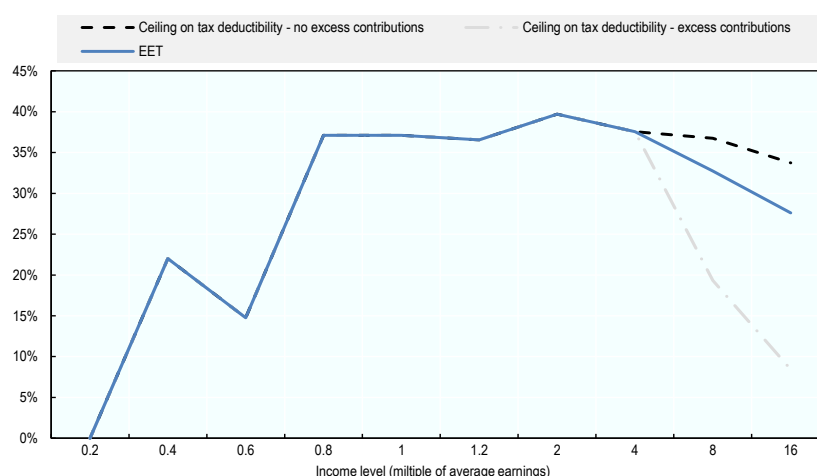
Tax credits expressed as a fixed nominal amount target tax advantages at low-income earners. As the value of the tax credit is fixed across the income scale, its value in relative terms declines with the income level. Unfortunately, individuals paying little or no income tax do not benefit as much when the credit is non-refundable.

By contrast, high-income earners are better-off when contributions are taxed at a fixed rate. Indeed, as the income level increases, the gap between the individual's marginal income tax rate and the fixed tax rate increases, leading to a larger tax advantage on contributions and thereby a larger overall tax advantage. However, this approach could act as a disincentive for very low-income earners if the fixed tax rate exceeds their marginal income tax rate (c.f. negative overall tax advantage for individuals earning 20% of average earnings, Figure 6.7).

The impact of introducing a ceiling on tax-deductible contributions depends on whether individuals make excess contributions. Figure 6.8 compares the overall tax advantage across different income groups, when there is no ceiling on the tax-deductibility of contributions ("EET") and when a ceiling is introduced, with and without the possibility of making excess contributions. When excess contributions are allowed, introducing a ceiling reduces the amount of taxes saved only for individuals who contribute beyond the ceiling. The ceiling has no impact on the overall tax advantage as long as contributions remain below it. When the analysis assumes that all individuals contribute the same proportion of their earnings (5%), the likelihood of exceeding the ceiling increases with income. In addition, as the ceiling is set as a fixed nominal amount, the part of taxable contributions increases with the income level, thereby reducing the tax advantage on contributions and the overall tax advantage as income increases.

Figure 6.8. Overall tax advantage for the "EET" tax regime, with and without a ceiling on tax deductibility, by income level

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



Note: "E" stands for exempt and "T" for taxed. The calculations assume an individual contributing 5% of wages from age 20 to 64 and withdrawing benefits from age 65 to 84 as a fixed-payment annuity. The tax system is such that tax rates increase with taxable income. The ceiling corresponds to 20% of the average earnings in the economy.

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However, when excess contributions are not allowed, or when individuals do not want to contribute above the ceiling, high-income individuals actually get a larger overall tax

advantage. When individuals refrain from making excess contributions because those contributions do not get tax relief, the introduction of the ceiling modifies the amount contributed into the plan. High-income earners are more likely to reach the ceiling and therefore to reduce their contributions as a proportion of their earnings. This would lead high-income earners to accumulate fewer assets, have lower pension benefits, and therefore pay less tax (as compared to a situation without the ceiling). Lower pension benefits translate into a higher overall tax advantage for high-income earners because the proportion of their total pension income in the last tax bracket will be lower compared to a situation without the ceiling (c.f. individuals earning 8 or 16 times the average earnings in Figure 6.8, black dashed line).

Finally, most of the approaches to providing partial tax relief on contributions are income neutral in tax systems where individuals have their entire income taxed at a fixed rate. A tax credit calculated as a fixed nominal amount would still offer the largest overall tax advantage to low-income earners. In addition, in personal income tax systems where all individuals pay tax on their first unit of income, even very low-income earners can benefit from tax credits.

6.4. Evolution of the fiscal cost when changing the approach to designing financial incentives to promote savings for retirement

This section looks at the evolution of the fiscal cost when changing the approach to designing financial incentives to promote savings for retirement.

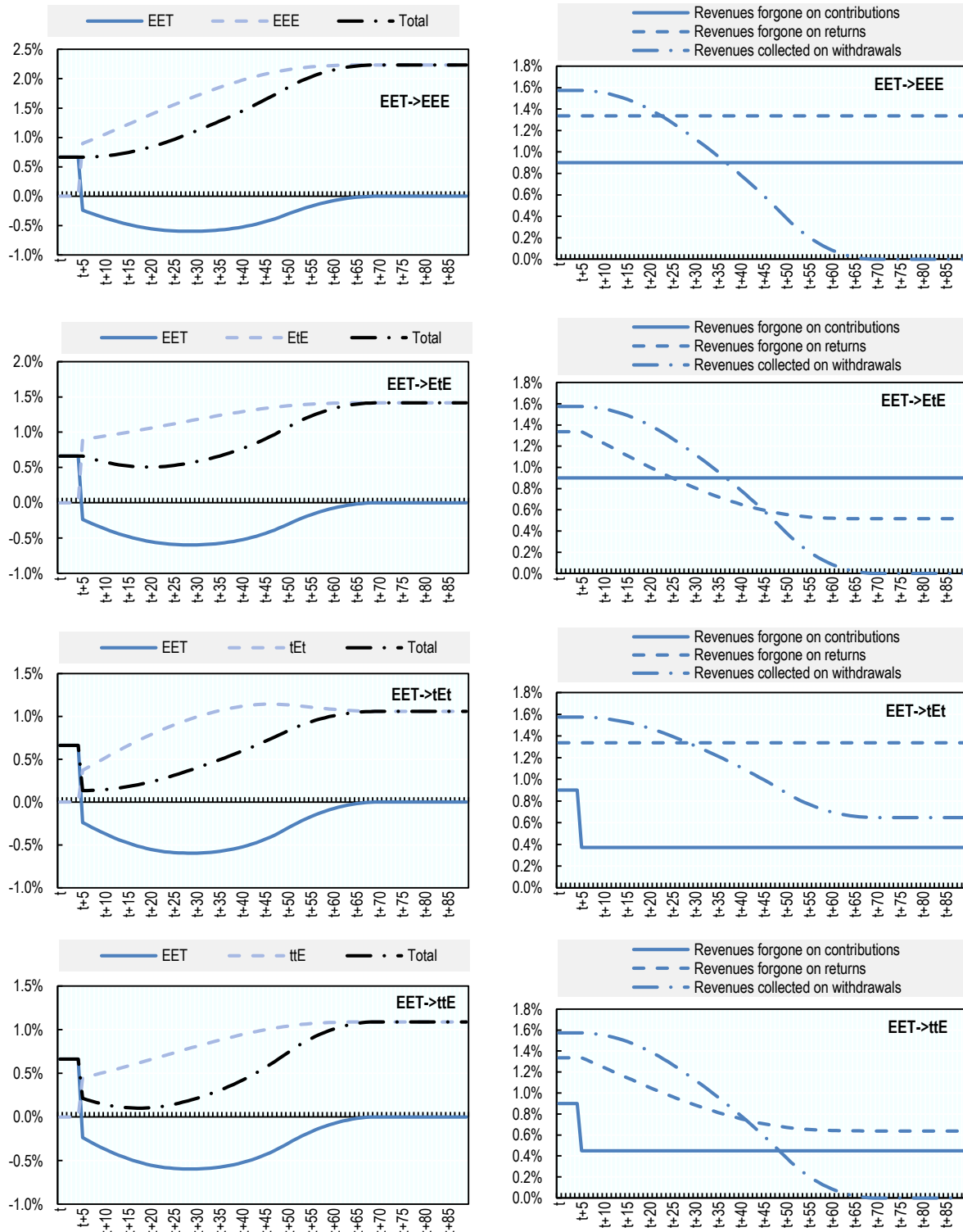
The analysis focuses on the transition from the current main approach to designing financial incentives (exempting contributions and returns on investment while taxing withdrawals, “EET”) to different alternative approaches. The fiscal cost is assessed through the calculation of the net tax expenditure related to the preferential tax treatment of retirement savings and of direct spending related to non-tax incentives.⁸ The analysis calculates the yearly net tax expenditure associated with the tax treatment of private pension plans, today and into the future, based on the revenue forgone method and using the cash-flow approach. The revenue forgone method measures the amount by which tax revenues are reduced by a particular tax concession, under the assumption of unchanged behaviour from the taxpayer. The cash-flow approach estimates the effect on government cash-flows in a given year. The net tax expenditure in a given year is calculated as the net amount of tax revenues forgone on contributions, tax revenues forgone on accrued income and tax revenues collected on withdrawals. The section first assesses the impact of a transition from the “EET” tax regime to another tax or non-tax incentive and then looks at the impact of reducing tax relief on contributions following different approaches.

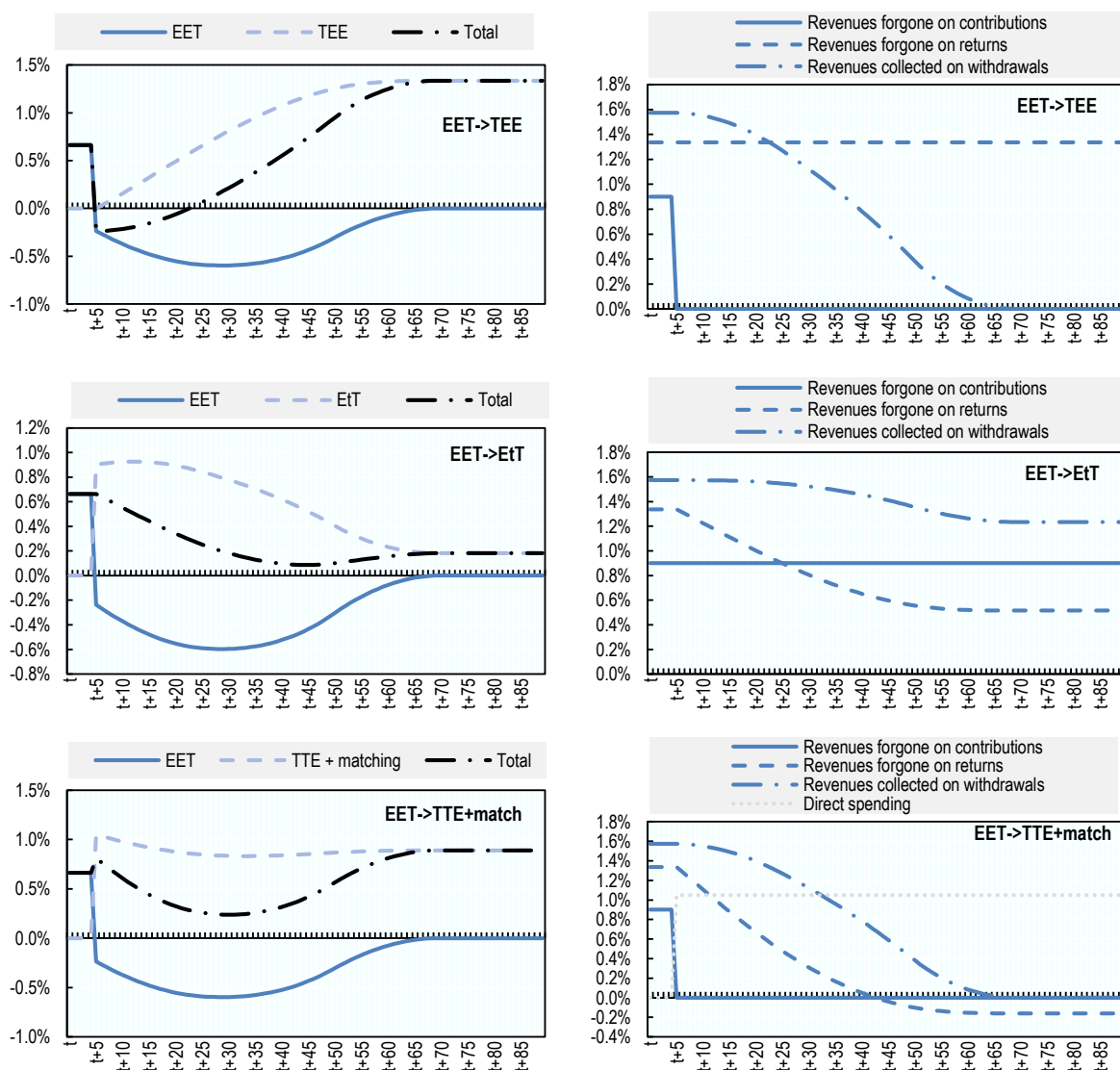
Transition to alternative tax and non-tax incentives

This sub-section looks at the evolution of the fiscal cost over time when there is a transition from the “EET” tax regime to an alternative tax or non-tax incentive. Figure 6.9 shows projections of the fiscal cost and its components (revenues forgone on contributions, revenues forgone on returns, revenues collected on withdrawals and direct spending) for a pension plan with “EET” tax incentives. The pension plan is mature in year t and replaced five years later, at $t+5$, by an alternative tax or non-tax incentive for new entrants to the labour market.⁹ The left panel of Figure 6.9 shows the total fiscal cost, as well as the fiscal cost resulting from the “EET” tax regime and the alternative incentive. The right panel shows tax revenues forgone on contributions, tax revenues forgone on returns, taxes collected on withdrawals and direct spending resulting from the transition between the two approaches.

Figure 6.9. Fiscal cost and its components in case of a transition from an “EET” tax regime to an alternative incentive

As a percentage of GDP





Note: “E” stands for exempt, “T” for taxed and “t” for partial tax relief. The calculations assume that individuals save from age 20 to 64 and draw pension benefits from age 65 to 84; contributions represent 3% of GDP; the number of people in each single-year age cohort is equal; the same average tax rate (30%) applies to all sources of income; a nominal rate of return of 5.06% (3% real return plus 2% inflation); GDP growth at 3.28% (1.25% real growth plus 2% inflation). See Box 6.1 for the detailed design of each incentive.

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The fiscal cost follows a regular trend when there is a transition from the “EET” tax regime to an alternative tax incentive that either exempts withdrawals or taxes returns, everything else being equal. When exempting withdrawals (transition to the “EEE” tax regime), the net tax expenditure increases as the proportion of taxable pension income decreases over time. When taxing returns on investment (transition to the “EtT” tax regime) the net tax expenditure declines as the tax relief on returns is reduced. This is, however, slightly compensated by a decrease in taxes collected on withdrawals. This stems from the fact that assets grow at a lower post-tax rate of return (as compared to the

“EET” tax regime), translating into lower assets accumulated at retirement and lower pension benefits for future retirees.

For the transitions to the other alternative tax incentives it is necessary to distinguish between the short term and the long term to understand the evolution of the fiscal cost. In the short term, the transition from the “EET” tax regime to either of the “EtE”, “tEt”, “ttE” or “TEE” tax regimes translates into a lower net tax expenditure. This is despite the fact that these approaches provide a similar or larger tax advantage to individuals than the “EET” tax regime. That result is due to the phasing out of the “EET” tax regime. Indeed, for the four alternative tax incentives, some of the fiscal costs are reduced overnight when the new system is introduced at $t+5$, as contributions stop being paid in the “EET” plan and start building assets in the new plan. There is a reduction in tax revenues forgone on returns on investment for the “EtE” and “ttE” tax regimes, while there is a reduction in tax revenues forgone on contributions for the “tEt”, “ttE” and “TEE” tax regimes. At the same time, revenues collected on withdrawals are still high at $t+5$, as all retirees have contributed to the “EET” system and therefore pay taxes on their pension benefits. Over time, tax revenues collected on withdrawals decline slowly (to zero for the “EtE”, “ttE” and “TEE” tax regimes), resulting in an increase in the net tax expenditure. Therefore, the net tax expenditure follows a U-shape following the transition, first declining and then increasing.

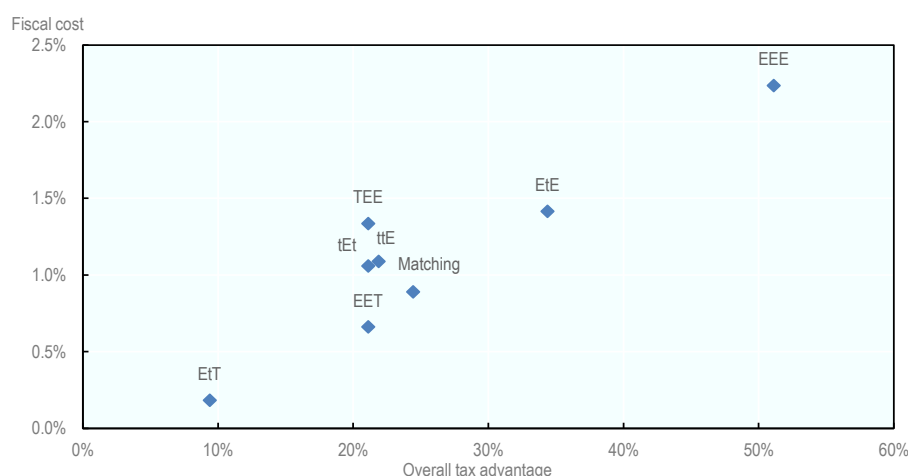
Taxing retirement savings upfront (“TEE”) rather than upon withdrawal (“EET”) costs more to the treasury in the long term, despite the fact that both tax regimes provide the same overall tax advantage to individuals (when tax rates during working years remain at the same level during retirement, which is what is assumed in Figure 6.9). Indeed, the net tax expenditure related to the “TEE” tax regime is just equal to tax revenues forgone on returns because as compared to the tax treatment of traditional savings vehicles (where only withdrawals are exempt from taxation) only the tax treatment of returns is different. The net tax expenditure related to the “EET” tax regime is lower for a mature pension system, as taxes collected on withdrawals more than compensate for tax revenues forgone on contributions (because withdrawals are the result of the accumulation of contributions and the compound interest on those accumulations). Consequently, the net tax expenditure resulting from the “EET” tax regime is lower than just tax revenues forgone on returns on investment. In the short term however, the transition from taxation upon withdrawal to upfront taxation would lead to a sharp decline in the net tax expenditure, as explained above.

The transition from the “EET” tax regime to a non-tax incentive also involves two phases for the evolution of the fiscal cost. The last panel of Figure 6.9 shows the transition to a matching contribution approach, but the mechanism is the same for a fixed nominal subsidy, the only difference being the level of direct spending. In the short term, the transition to a matching contribution would reduce the fiscal cost. When the new system is introduced at $t+5$, direct spending on the matching contribution substitutes the tax expenditure related to tax revenues forgone on contributions.¹⁰ In addition, returns start to be taxed (the matching contribution is not associated with any preferential tax treatment), so that revenues forgone on returns decline (and turn into a net collection of taxes over time) and so do the total fiscal cost. At the same time, revenues collected on withdrawals are still high at $t+5$, as all retirees have contributed to the “EET” system and therefore pay taxes on their pension benefits. Over time, revenues collected on withdrawals decline to zero, explaining the final rise of the total fiscal cost.

The fiscal cost also increases when introducing a non-tax incentive on top of a tax incentive, for example a matching contribution with an “EET” tax regime. However, in the long run, that increase is smaller than the direct spending on the non-tax incentive, as it is partially compensated by an increase in tax revenues collected on the higher withdrawals.

There is no alternative approach that improves on the current main approach of taxing only withdrawals by simultaneously providing a higher tax advantage to individuals at a lower long-term fiscal cost. Figure 6.10 compares the overall tax advantage provided to the average earner by different approaches to designing financial incentives to their long-term fiscal cost. All the approaches that provide a higher tax advantage to the individual than the “EET” tax regime are also more costly to the treasury (“EEE”, “EtE” and matching). In addition, some approaches that provide a comparable tax advantage to the individual achieve higher fiscal costs (“TEE”, “tEt” and “ttE”). This is because they do not tax retirement benefits, or only at a reduced rate, generating less tax revenues once the system is mature.¹¹

Figure 6.10. Overall tax advantage and long-term fiscal cost for alternative approaches to designing financial incentives



Notes: “E” stands for exempt, “T” for taxed and “t” for partial tax relief. See Box 6.1 for the detailed design of each incentive.

For the fiscal cost: The calculations assume that individuals save from age 20 to 64 and draw pension benefits from age 65 to 84; contributions represent 3% of GDP; the number of people in each single-year age cohort is equal; the same average tax rate (30%) applies to all sources of income; a nominal rate of return of 5.06% (3% real return plus 2% inflation); GDP growth at 3.28% (1.25% real growth plus 2% inflation).

For the overall tax advantage: The calculations assume an average earner contributing 5% of wages from age 20 to 64 and withdrawing benefits from age 65 to 84 as a fixed-payment annuity. A single tax rate of 30% applies to all sources of income.

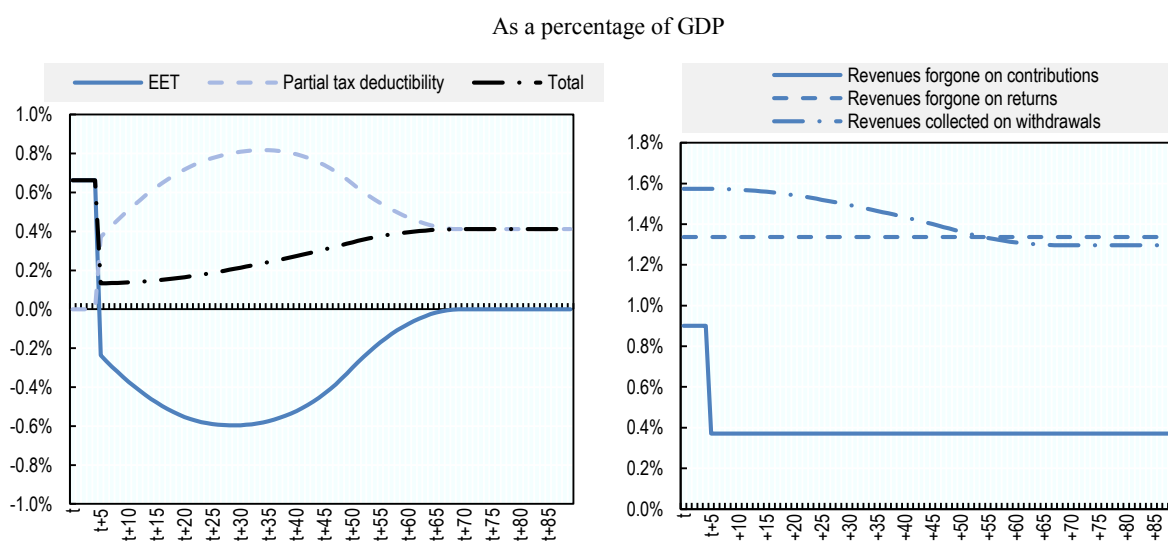
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Transition to partial tax relief on contributions

This sub-section compares the effect of providing partial tax relief on contributions on the net tax expenditure. Similarly to the previous sub-section, the analysis assumes that a mature pension plan with an “EET” tax regime in year t is replaced with a new pension plan with reduced tax relief on contributions five years later, at $t+5$, for new entrants to

the labour market. Figure 6.11 only shows the case of partial tax deductibility (50% of contributions), as the mechanism is the same for all the other approaches to providing partial tax relief on contributions.

Figure 6.11. Net tax expenditure and its components in case of a transition from an “EET” tax regime to a partial tax deductibility of contributions



Note: “E” stands for exempt and “T” for taxed. The calculations assume that individuals save from age 20 to 64 and draw pension benefits from age 65 to 84; contributions represent 3% of GDP; the number of people in each single-year age cohort is equal; the same average tax rate (30%) applies to all sources of income; a nominal rate of return of 5.06% (3% real return plus 2% inflation); GDP growth at 3.28% (1.25% real growth plus 2% inflation); 50% of contributions are tax deductible for the alternative approach.

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Reducing the tax relief on contributions lowers the net tax expenditure, especially in the short term. Indeed, the reduction in tax revenues forgone on contributions happens overnight when the new system is introduced at t+5, as contributions stop being paid in the “EET” plan and start building assets in the plan with reduced tax relief on contributions. At the same time, revenues collected on withdrawals are still high at t+5, as all retirees have contributed to the “EET” system and therefore pay taxes on their pension benefits. Over time, tax revenues forgone on returns remain constant, while tax revenues collected on withdrawals decline slowly, resulting in an increase in the net tax expenditure from the previous lower level. The decline in tax revenues collected on withdrawals stems from the fact that after-tax contributions are lower when paid in the plan with reduced tax relief on contributions. This translates into lower assets accumulated at retirement and lower pension benefits for future retirees. The new steady-state net tax expenditure is lower than the one for the “EET” system, but higher than at the time of the transition between the two systems.

6.5. Summary discussion and conclusion

This section brings together the analysis presented in the previous sections and discusses some implications of using different alternative approaches to designing tax and non-tax financial incentives to promote savings for retirement.

Providing higher tax advantages for certain income groups

Matching contributions, fixed nominal subsidies and tax credits can provide a higher tax advantage than even exempting from taxation all income flows for certain income groups. The tax regime where none of the flows are taxed (“EEE” tax regime) is the tax incentive leading to the highest tax advantage for the average earner, everything else being equal.¹² However, matching contributions and fixed nominal subsidies may provide larger incentives for certain income groups. For example, matching more than 75% of an individual’s contributions provides a larger tax advantage to an average earner than the “EEE” tax regime. For a low-income earner (with an income lower than 60% of average earnings), matching 50% of contributions is already enough to provide a more favourable tax advantage than the “EEE” tax regime. Similarly, tax credits can potentially lead to a higher tax advantage if the credit rate is large enough.

Taxing retirement savings upfront or upon withdrawal

Taxing retirement savings upfront (i.e. taxing only contributions, “TEE”) is often seen as an equivalent approach to taxing retirement savings upon withdrawal (“EET”). In particular, upfront taxation also achieves tax neutrality between saving and consuming, as long as returns are not above the normal return to saving (Mirrlees et al., 2011^[5]). However, there are a number of different implications for the individual and the government between the two designs that are worth analysing.

Upfront taxation (“TEE”) and taxation upon withdrawal (“EET”) provide the same overall tax advantage only when the income of the individual is subject to the same marginal tax rate throughout their working and retirement years. This is obviously the case in countries where the entire income is taxed at a fixed rate. However, in countries where tax rates increase with taxable income, not all individuals will be subjected to the same tax rate over their entire lifetime. In that case, the optimal tax treatment in terms of tax advantage depends on individuals’ circumstances.

Individuals would be better-off having their retirement savings taxed upfront or upon withdrawal depending on whether their income tax rate will be higher or lower during their working or retirement years. Individuals would be better-off paying taxes upfront (respectively upon withdrawal) when they expect tax rates during retirement to be greater (respectively lower) than they are when contributions are made. As discussed earlier, individuals usually face a lower tax rate during retirement than while working. When this is the case, taxation upon withdrawal will provide a higher overall tax advantage than upfront taxation. By contrast, individuals would be better-off paying taxes upfront when they expect tax rates during retirement to be greater than when they are working. For example, when both public and private pension incomes are taxable, the individual may be subject to a higher tax rate during retirement than the one at which tax relief was granted on contributions.¹³

Low levels of financial knowledge may, however, affect individuals’ behaviour and retirement plan choices when they are provided with the opportunity to choose between upfront taxation and taxation upon withdrawal. For example, Beshears et al. (2017^[6]) show that employees in the United States who are offered choice between a Roth 401(k)

plan (upfront taxation, “TEE”) and a traditional 401(k) plan (taxation upon withdrawal, “EET”) do not contribute less to their occupational pension plan than employees who could only contribute to a traditional 401(k) plan.¹⁴ The authors find that the insensitivity of contributions to the introduction of the Roth option is partially driven by ignorance and/or neglect of the different tax rules.

In addition, behavioural biases may lead to a different perception of the two tax treatments. Contributions to plans with taxation upon withdrawal immediately reduce the participant’s income tax due. Plans with upfront taxation do not provide tax relief today, they exempt future pension income from taxation. Because of present bias, individuals may want to secure the tax advantage earlier rather than later and therefore prefer taxation upon withdrawal.

By contrast, other behavioural factors could lead individuals to prefer upfront taxation. For example, Cuccia, Doxey and Stinson (2017^[7]) 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 due to tax reforms or to a change in the individual’s economic status. Low levels of financial literacy and behavioural biases may therefore lead some individuals to choose the plan with the tax treatment that would not provide them with the largest overall tax advantage.

Taxation upon withdrawal may also discourage early withdrawals and lump sum payments. With taxation upon withdrawal, pension benefits are added to the individuals’ earnings and taxed at their marginal rate. Early withdrawals when the individual is still working and earning work income may therefore push taxable income into a higher tax bracket. In the same way, lump sum benefits may represent large amounts that move an individual into a higher tax bracket than would apply to a lower annual level of pension benefits (annuities or programmed withdrawals) if the same tax treatment applies to all types of post-retirement product. By contrast, upfront taxation with no tax on withdrawals creates no financial disincentive for early withdrawals and lump sum payments.

Although upfront taxation may be appealing to the treasury because it does not defer tax collection, in the long run this tax regime may translate into a higher fiscal cost than taxation upon withdrawal. If we compare the yearly fiscal effects of the two tax regimes, we see that in the short term, upfront taxation leads to a lower fiscal cost than taxation upon withdrawal. This is because, when taxing only withdrawals, tax collection is deferred, while the cost related to tax revenues forgone on contributions is fully incurred as they are made. With upfront taxation, the net tax expenditure is simply equal to tax revenues forgone on returns. In the long term, once the two systems reach maturity, the fiscal impact is reversed: taxation upon withdrawal leads to a lower annual fiscal cost than upfront taxation. This is because, with taxation of withdrawals, tax revenues collected more than compensate for tax revenues forgone on contributions, as the size of withdrawals in a given year exceeds the size of contributions in a mature pension system.^{15 16}

Upfront taxation may be preferable when considering mobility across countries. If individuals initially contribute to a plan with taxation upon withdrawal and then move to another country later in their working life or after retirement, the original country faces a tax revenue loss if those individuals pay income tax in their new country of residence, unless there are perfectly offsetting movements in the opposite direction. With upfront taxation, mobility across countries does not impact tax revenues across countries. Retirement savings are taxed in the country where contributions are made and whether the individual later moves does not affect tax revenues.

Using tax credits or tax deductions

Non-refundable tax credits and tax deductions are economically equivalent when the credit rate is equal to the deduction rate. For example, for an individual facing a 30% marginal tax rate, it is equivalent to deduct contributions from taxable income or to get a tax credit of 30%.¹⁷

Tax credits achieve a smoother overall tax advantage across income groups than tax deductions at the marginal rate. Tax credits provide the same tax relief on after-tax contributions to all individuals with sufficient tax liability, independent of their income level and marginal income tax rate. They are equivalent to tax deductions at fixed rate, except for very low income-earners who benefit less from the tax credit because of its non-refundable nature.

Tax credits and tax deductions are, however, not very valuable for individuals with low or no income tax liability, unless tax credits are refundable. Individuals whose tax liability is lower than the value of a non-refundable tax credit will not receive the full credit. For individuals not paying income tax, deducting contributions paid into a pension plan does not reduce the income tax due. Making tax credits refundable (i.e. when the tax credit is higher than income tax due, the treasury pays the difference to the individual) restores their attractiveness for low-income earners as long as claiming the credit is not too cumbersome. Additionally, tax credits may also be expressed as a fixed nominal amount and be used to target the tax advantage at low-income earners, as the nominal amount represents a higher share of their income.

The structure of tax declaration and tax collection may influence individuals' perception of the two approaches and lead to different outcomes. For example, when pension contributions are deducted from pay before calculating and paying personal income tax, the tax relief is automatically provided and saved in the pension account. This may not be the case when tax deductions and tax credits need to be claimed through the income tax declaration. When contributions are first taxed at the individual's marginal rate, the tax refund may be provided later in the year or even the following year to the individual. If individuals anticipate that they will eventually get a tax refund, they can increase their after-tax contribution to save the whole tax relief in the pension account. However, if they do not anticipate it, the after-tax contribution may not be as high as with an automatic direct tax deduction.¹⁸

Using tax incentives or non-tax incentives

Non-tax incentives are not linked to the individual's tax status, making them attractive to all individuals. Matching contributions are calculated as a proportion of after-tax contributions. With fixed nominal subsidies, all eligible individuals receive the same amount in their pension account. As non-tax incentives are not linked to the individual's tax status, the value of the incentive is not limited by the tax liability.¹⁹ Therefore all individuals can fully benefit from them as long as they fulfil the entitlement requirements (e.g. having an income below a certain level, contributing a certain proportion of income).

Moreover, non-tax incentives are paid directly into the pension account, which may not always be the case with tax incentives. Non-tax incentives are automatically paid into the pension plan, therefore increasing the assets accumulated by retirement and future pension benefits. By contrast, individuals eligible for a tax credit or a tax deduction (when it needs to be claimed) may not save the value of the incentive in the pension

account if they do not increase their after-tax contributions in anticipation of the lower tax withholding or the receipt of a tax refund.

In addition, matching contributions may have a larger impact on retirement savings than economically equivalent tax credits.²⁰ A study by Saez (2009_[8]) shows that individuals receiving a 50% matching contribution participate more in retirement savings plans and contribute more than individuals receiving an equivalent incentive framed as a 33% tax credit.²¹ This result suggests that taxpayers do not perceive the match and the tax credit to be economically identical. Some individuals may have perceived the 33% credit rate as equivalent to a 33% match rate, thereby reducing the incentive. Another factor could be that individuals had to wait for two weeks to receive the credit rebate. Due to loss aversion, contributing for example USD 450 and then receiving USD 150 back may feel more painful than contributing just USD 300 and obtaining a match of USD 150 to reach the same USD 450 total contribution.

Matching contributions alone, when not associated with other tax incentives, provide a higher overall tax advantage to low-income earners when tax rates increase with taxable income. This is despite the fact that the match rate is equal for everyone. When the matching contribution is associated with a “TTE” tax regime, the match rate applies to after-tax contributions, implying that individuals with higher marginal tax rates receive a lower tax advantage on their contributions. Moreover, returns on investment are taxable. Taxes paid on returns are higher compared to a traditional savings vehicle because matching contributions increase the level of total contributions and generate additional investment income. Therefore, the overall tax advantage provided by matching contributions declines with the individual’s income level. This is an important difference with tax incentives, which tend to offer larger overall tax advantages to higher-income earners in tax systems where tax rates increase with taxable income.

Substituting deductible contributions for government matching contributions may increase participation in retirement savings plans. For example, in Turkey, participation in pension plans was initially encouraged through tax-deductible contributions. In order to make the system more inclusive and boost savings, tax relief on contributions was replaced by government matching contributions in January 2013.²² Between 2012 and 2013, the number of new participants increased by 65%, suggesting that government matching contributions were more effective in increasing the attractiveness of saving for retirement for some people.

From the point of view of the government, the difference between tax and non-tax incentives stems from the salience of the cost of promoting savings for retirement. The budgetary cost of a financial incentive would ordinarily be the same whether incurred in the form of a direct spending (non-tax incentive) or an equal amount of tax expenditure (tax incentive). Tax expenditures however involve a cost less salient or obvious than the cost of a government spending programme.

Adding non-tax incentives to tax incentives

Most OECD countries already have tax incentives in place. Removing them may be politically and in practice cumbersome. Adding non-tax incentives to tax incentives could be envisaged. For example, introducing matching contributions for a pension plan that is already subject to the “EET” tax regime increases the overall tax advantage provided to individuals and the fiscal cost to the treasury, but achieves a smoother overall tax advantage across income groups. Moreover, the additional fiscal cost is limited in the long term by the extra tax collected on larger withdrawals. It could also be contained by

capping matching contributions and/or the amount of contributions that can be deducted, although these approaches would modify the relationship between the overall tax advantage and the income level.

Conclusion

This chapter has assessed alternative approaches to designing financial incentives to promote savings for retirement. The assessment has been done relative to the most common approach used currently to provide financial incentives, taxing only withdrawals and exempting the other income flows, contributions and returns on investment (“EET” tax regime). The alternative approaches examined include different ways of taxing retirement savings, like taxing only contributions (“TEE”), as well as non-tax incentives like matching contributions and fixed nominal subsidies. The chapter has compared the different approaches based on the overall tax advantage they provide to individuals saving for retirement and the fiscal cost for the treasury.

The results lead to a few general conclusions:

- The best approach to designing incentives to promote savings for retirement depends on the policy objective. Compared to the current main approach of taxing only withdrawals, there is no alternative approach to designing financial incentives that provides a higher overall tax advantage to the individual at a lower fiscal cost to the treasury simultaneously.
- Tax incentives, including the current main approach of taxing only withdrawals, tend to provide the largest tax advantages to high-income earners.
- When the policy objective is to provide a similar tax advantage across income groups, tax credits expressed as a proportion of contributions, tax deductions at fixed rate and matching contributions added to existing tax incentives can be used. These approaches increase the attractiveness of saving for retirement for middle to low-income groups, while reducing it for high-income earners, compared to the “EET” tax regime.
- When the policy objective is to encourage low-income earners specifically to save for retirement, tax credits expressed as a fixed nominal amount as well as non-tax incentives, such as matching contributions and fixed nominal subsidies, are appropriate approaches.
- When the policy objective is to reduce the fiscal cost, it is possible to reduce tax relief on contributions through partial, fixed or capped tax deductions, as well as tax rate reliefs. Taxing returns on investment is another alternative.
- Tax incentives that provide the same overall tax advantage to the individual can have different cost implications for the treasury. For example, when comparing upfront taxation with taxation upon withdrawal (i.e. “TEE” and “EET”), in the short term, because taxation is deferred, taxation upon withdrawal leads to a higher fiscal cost than upfront taxation. In the long term however, when the system is mature, taxation upon withdrawal will imply a lower fiscal cost than upfront taxation because the tax collected on withdrawals in the “EET” regime is higher than the tax collected on contributions in the “TEE” regime.
- Tax incentives designed in such a way that pension benefits are taxed tend to achieve comparatively lower fiscal costs than other approaches in the long term.

Notes

¹ The methodology used to calculate the overall tax advantage is described in Chapter 3.

² As opposed to the overall tax advantage which is calculated over the lifetime of an individual, the fiscal cost is calculated over the total population at different points in time. On the one hand, at the level of the individual, the present value of the sum of all taxes collected on withdrawals during retirement is equal to the present value of the sum of all taxes saved on contributions while working, as long as the same tax rate applies during working and retirement years. On the other hand, the calculation of the net tax expenditure sums up revenues forgone on contributions and on returns from working individuals with revenues collected on withdrawals from retirees. When the system is mature, the size of withdrawals in a given year is more important than the size of contributions, as withdrawals are the result of several years of contributions accumulating with compound interests.

³ A higher tax rate applies for very-high earners, at 30%.

⁴ The Mexican government matches each peso contributed voluntarily by civil servants with 3.25 pesos. Individuals can contribute up to 2% of their income to this plan.

⁵ For the approach that taxes only returns on investment at a fixed rate of 15% (“EtE” tax regime), the analysis shows that the tax advantage on returns is positive. This however depends on the assumption for the fixed tax rate. If the fixed tax rate increases, the tax advantage on returns diminishes and even turns negative for a tax rate above 20%. This stems from the fact that the amount contributed in the pension plan is higher than in the benchmark traditional savings vehicle (because of the tax deductibility of contributions), thereby increasing investment income and the tax due on it.

⁶ The neutrality between the two tax regimes also requires that the discount rate is equal to the rate of return.

⁷ For all the approaches, the analysis assumes that returns on investment are tax exempt and that withdrawals are considered as taxable income. Therefore, only the tax treatment of contributions differs between the different approaches.

⁸ The methodology used to calculate the net tax expenditure is described in Chapter 5.

⁹ The parameters are the same as those presented in Box 6.1.

¹⁰ The cost related to the direct spending may be larger, smaller or equal to the cost related to tax revenues forgone on contributions depending on the parameters used to define the matching contribution (match rate and ceiling).

¹¹ The ranking of the different approaches according to the tax advantage they provide to the average earner is different from the one presented in Figure 6.3. In order to compare the different approaches to designing financial incentives on their fiscal cost and the overall tax advantage they provide to the average earner, it is necessary to assume that the average earner is subjected to the same fixed tax rate on contributions, returns and withdrawals (30%). This is because, for the calculation of the net tax expenditure, the analysis assumes that the same average tax rate of 30% applies to all sources of income and for all the individuals in the economy. In Figure 6.3, the calculations of the overall tax advantage assume that the tax rate varies with the average earner’s level of taxable income along his/her life (i.e. labour income while working and public and private pension income while retired).

¹² This result is valid when all tax incentives are compared within the framework of the same personal income tax system.

¹³ Another example is when means-tested public pension benefits treat “EET” and “TEE” withdrawals differently, including the former for the means test but not the latter.

¹⁴ With upfront taxation, lower after-tax contributions are needed to achieve the same after-tax benefit in retirement as with taxation upon withdrawal (assuming that tax rates remain the same over the lifetime). The authors therefore expected that contributions would go down after the introduction of the Roth option in the occupational pension plan.

¹⁵ The size of withdrawals would, however, be lower if retirees pay taxes on their pension benefits at a lower rate than the one at which they got tax relief on their contributions while working.

¹⁶ If the government invests the taxes collected on contributions with the upfront taxation regime instead of spending them, it could obtain the same gains when the system reaches maturity as with the tax regime that taxes retirement savings upon withdrawal.

¹⁷ With tax credits, contributions are included in taxable income. This implies that tax is paid on them and the tax credit is calculated based on the level of after-tax contributions.

¹⁸ Approaches that lead to lower after-tax contributions than direct tax deductions entail a larger fiscal cost because fewer assets are accumulated by retirement, leading to lower pension benefits and less tax collected on withdrawals.

¹⁹ Refundable tax credits could replicate the economic effects of non-tax incentives, as long as they are refunded directly into a pension account.

²⁰ A credit rate of t is economically equivalent to a match rate on the contribution of $t/(1-t)$. For example, a 25% refundable tax credit is economically equivalent to a matching contribution of one-third. This is because the tax credit rate is expressed as an inclusive rate (i.e. including the value of the credit), while the match rate is expressed as an exclusive rate (i.e. excluding the value of the matching contribution).

²¹ The study compares participation in and contributions to IRAs in the United States. An “EET” tax treatment applies to IRAs. The matching contribution and tax credit in the experiment supplement the already existing tax incentive.

²² The tax treatment of returns on investment and withdrawals has remained the same over time, with returns taxed upon withdrawals and withdrawals tax exempt.

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Chapter 7. Policy guidelines to improve the design of financial incentives to promote savings for retirement

This chapter provides eleven policy guidelines to help countries improve the design of their financial incentives to promote savings for retirement. It considers the different results discussed and examined in the previous chapters for arguing in support of each of the policy guidelines.

The purpose of this monograph has been to review how countries design financial incentives to promote savings for retirement and examine whether there is room for improvement. Given the fiscal cost that financial incentives entail to governments, it is important to verify whether they are effective tools to promote savings for retirement, taking into account different needs across different population subgroups.

Financial incentives covered in this monograph take two forms, tax incentives and non-tax incentives. Tax incentives come from a differential tax treatment applied to funded pension arrangements as compared to other savings vehicles. In all OECD countries, the tax regime applied to funded pension arrangements deviates from the “Taxed-Taxed-Exempt” (“TTE”) tax regime that usually applies to traditional forms of savings, and in which contributions are paid from after-tax earnings, the investment income generated by those savings is taxed and withdrawals are exempt from taxation. Half of the OECD countries apply the “Exempt-Exempt-Taxed” (“EET”) tax regime to retirement savings that exempts contributions and returns on investment from taxation, but taxes withdrawals.

Non-tax financial incentives are payments made by governments directly into the pension account of eligible individuals. They can take the form of matching contributions or fixed nominal subsidies. Government matching contributions are found in Australia, Austria, Chile, the Czech Republic, Hungary, Mexico, New Zealand, Turkey, the United States, Colombia and Croatia. Only five OECD countries use government fixed nominal subsidies to promote private pensions: Chile, Germany, Lithuania, Mexico and Turkey.

This chapter provides eleven policy guidelines to assist countries to improve the design of their financial incentives to promote savings for retirement. It combines the different results presented in the previous chapters to argue for each policy guideline.

7.1. Financial incentives are useful tools to promote savings for retirement

Financial incentives are useful tools to promote savings for retirement because they are effective at raising retirement savings and help people diversify their sources to finance retirement income.

Financial incentives are effective in raising retirement savings

Tax incentives are effective in raising participation in and contributions to retirement savings plans. Middle and high-income earners react to tax incentives that exempt contributions from taxable income in progressive personal income tax systems, where tax rates increase with taxable income (Chapter 4). This is because individuals respond to the upfront tax relief on contributions that reduces their current tax liability. When contributions are deductible from taxable income, tax relief on contributions increases when taxable income jumps from one tax bracket to the next.

Non-tax financial incentives are better suited to low-income earners. Low-income earners are less sensitive to tax incentives than other income groups. They may lack sufficient resources to afford contributions, but in addition, they may not have enough tax liability to fully enjoy tax relief and they are more likely to have low levels of understanding of tax-related issues. Non-tax financial incentives are therefore better suited to encourage these individuals to save for retirement. Empirical evidence shows that matching contributions and fixed nominal subsidies increase participation in retirement savings plans, especially among low-income earners, although the impact on contribution levels is less clear (Chapter 4).

Participation levels reached with financial incentives alone are typically lower than those obtained through compulsion or automatic enrolment mechanisms. However, some countries may prefer voluntary systems to implementing either of those two policies, while still willing to encourage individuals to save for retirement. Financial incentives keep individual choice and responsibility for retirement planning, as individuals should ultimately be the best placed to evaluate their personal circumstances and determine the most appropriate level of retirement savings that takes into account all of their sources of income.

Financial incentives lead to an increase in national savings, but it is not clear by how much. There is a debate on whether tax incentives for retirement savings plans increase retirement savings as a result of people actually increasing their overall savings (new savings) or as a result of people reallocating savings from traditional savings vehicles. Studies vary in their conclusions, with findings ranging from 9% to 100% of retirement savings representing new savings (Chapter 4). The empirical measurement of whether tax incentives for retirement savings lead to an increase in national savings is inconclusive because of a number of constraints and methodological issues. A reasonable estimate would be that between a quarter and a third of retirement savings in tax-favoured plans represent new savings.

There is, however, more consistent evidence in the literature that low-to-middle income earners are more likely to respond to tax incentives by increasing their overall savings, while high-income earners tend to reallocate their savings. As low-income earners have little wealth, when they decide to contribute to a tax-favoured retirement savings plan their contributions essentially represent new savings. By contrast, high-income earners are more likely to finance contributions to tax-favoured accounts by shifting assets from other taxable accounts or taking on more debt, rather than reducing their consumption.

Therefore, the proportion of new savings in tax-favoured retirement plans will depend on the marginal propensity to save of different income groups, and on whether tax incentives are designed in a manner that will make them more accessible by, or attractive to, individuals at different income levels.

This question of whether financial incentives create new savings is important, as granting financial incentives is costly for the government, in terms of forgone tax revenues or direct spending. The fiscal cost of financial incentives falls with the amount of new savings. However, even if they fail to increase national savings by bringing in new savings, financial incentives may still be a valuable mechanism to encourage people to earmark savings for retirement, in order to make sure that they have enough resources to finance retirement and will not rely on the public safety net once they retire.

Financial incentives help people diversify their sources of retirement income

How best to allocate government resources to enhance retirement income is an important issue to consider. Is it better to provide financial incentives to encourage people to save in supplementary funded pension schemes, or to increase benefits paid by the mandatory pay-as-you-go (PAYG) public pension scheme? The financial resources allocated to financial incentives could be used instead to increase pension benefits in the PAYG public scheme. To address this question, the analysis that follows uses hypothetical scenarios to illustrate some of the implications of removing financial incentives in favour of higher spending in public pension systems.

The baseline scenario represents a situation where financial incentives for retirement savings are in place. It assumes that an average earner subject to a constant 30% marginal tax rate contributes 10% of gross wages yearly to an “EET” supplementary pension plan from age 20 to 64 and withdraws benefits afterwards in the form of a 20-year fixed nominal annuity. The overall cost to the government comes from the tax exemption of returns on investment. Assuming average earnings of EUR 35 000, inflation of 2%, productivity growth of 1.25%, real returns of 3% and a real discount of 3%, the total fiscal cost over the lifetime of the individual amounts to EUR 27 844 in present value terms and the after-tax yearly pension income the individual would receive from age 65 to 84 amounts to EUR 54 854.

Removing tax incentives and using the money to finance additional public pension benefits would reduce the overall level of benefits compared to the baseline. This new scenario assumes that the individual stops contributing to a supplementary pension plan because tax incentives have been removed. It keeps the fiscal cost constant by assuming that the equivalent amount of money (EUR 27 844 over the lifetime of the individual in present value) is used to finance additional public pension benefits for the individual. That money can finance a yearly after-tax additional public pension of EUR 19 706 from age 65 to 84, or only 36% of the pension income generated by a full career of contributions into a tax-incentivised retirement plan (EUR 54 854).

To cover the resulting gap in pension income while keeping the cost to the government constant, the individual would need to save some additional funds in a non-tax-favoured savings vehicle (“TTE”). Contributions to a “TTE” vehicle would not increase the fiscal cost for the government, as this tax regime is the assumed baseline for the taxation of savings. The individual would need to contribute 9% of gross wages pre-tax, or 6.3% after-tax, into a “TTE” vehicle to reach the same level of benefits as were produced by the tax-favoured savings and the lower level of public pension benefits in the baseline. This is less than the 10% contribution rate in the baseline. However, it is not clear whether, without financial incentives, the individual would actually save that amount, in particular given that the “TTE” tax regime discourages savings (in favour of consumption).¹

The level of contributions in non-tax-favoured savings vehicles could be further reduced if the government were to create a fund to accumulate and invest the money allocated to the financial incentives over the lifetime of the individual. This would allow the government, as long as the accumulated resources are earmarked for this purpose only, to finance larger additional public pension benefits and reduce the amount of contributions that the individual would have to save in a non-tax-favoured plan to reach the same level of overall pension income as in the baseline scenario. The reduction in the contribution rate would depend on the returns earned by the investment of the government fund, which in turn would depend on whether this fund could invest in a large range of asset classes like any other pension fund or just in long-term government bonds.

This simple example shows that it could be difficult for a government to remove financial incentives and use the equivalent amount of money to increase public pension benefits. If this were done it might leave individuals with a lower retirement income if they do not make extra savings in a non-incentivised plan. In addition, it is contrary to the OECD principle of diversifying the sources to finance retirement income (Chapter 1 of (OECD, 2016^[1])).

7.2. Tax rules should be straightforward, stable and common to all retirement savings plans in the country

Complex tax incentives' structures and frequent changes to the tax rules may reduce the impact of tax incentives on retirement savings.

Tax incentives are difficult to understand. For example, in the United Kingdom in 2012, only 46% of survey respondents knew that money paid into private pensions qualifies for tax relief (Macleod et al., 2012^[2]). Moreover, when people are provided choice between plans with different tax treatments, their lack of understanding may lead them to misjudge the alternative plans and fail to pick the most appropriate tax regime. For example, Beshears et al. (2017^[3]) show that employees in the United States who are offered choice between a Roth 401(k) plan (upfront taxation, "TEE") and a traditional 401(k) plan (taxation upon withdrawal, "EET") do not contribute less to their occupational pension plan than employees who could only contribute to a traditional plan. With upfront taxation, lower after-tax contributions are needed to achieve the same after-tax benefit in retirement as with taxation upon withdrawal (assuming that tax rates remain the same over the lifetime). The authors therefore expected that contributions would go down after the introduction of the Roth option in the occupational pension plan. The authors find that the insensitivity of contributions to the introduction of the Roth option is partially driven by ignorance and/or neglect of the different tax rules.

There is a lot of heterogeneity in the tax treatment of retirement savings plans within countries, adding complexity and confusion. Chapter 2 shows that the tax treatment of contributions to retirement savings plans may change according to the source of the contributions (the employee or the employer), their mandatory or voluntary nature, the type of plan into which they are paid (personal or occupational), or the income of the plan member. In addition, limits to the amount of contributions attracting tax relief may differ for different types of contribution. In countries where returns are taxed, tax rates may vary according to the holding period of the investments, the type of asset class, or the income of the plan member. Moreover, the tax treatment of pension income may differ according to the source of the contributions, the form of the post-retirement product or the age of retirement. All this heterogeneity in the tax treatment of retirement savings complicates the decision that individuals may need to make about how, when, where and how much to save for retirement.

Finally, frequent changes to tax rules may reduce trust in the pension system and prevent individuals from adequately planning ahead.

Tax rules for retirement savings should therefore be straightforward, stable and common to all retirement savings plans in the country to avoid creating confusion among people who may find difficult to understand the differences and choose the best option for them.

7.3. The design of tax and non-tax incentives for retirement savings should at least make all income groups neutral between consuming and saving

Chapter 3 introduced the overall tax advantage which is used throughout the monograph to assess whether the tax treatment of retirement savings and the non-tax incentives paid by governments provide a financial or tax advantage when people save for retirement. The overall tax advantage is defined as the difference in the present value of total tax paid on contributions, returns on investment and withdrawals when an individual saves in a benchmark savings vehicle or in an incentivised retirement plan, given a constant

contribution rate during the entire career. It is expressed as a percentage of the present value of pre-tax contributions. The overall tax advantage therefore represents the amount saved in taxes by the individual over working and retirement years when contributing the same amount (before tax) to an incentivised pension plan rather than to a benchmark savings vehicle.

The overall tax advantage should not be confused with the incentive to save. A positive overall tax advantage means that the individual would save in taxes paid when contributing to an incentivised retirement plan rather than to a benchmark savings vehicle. It does not mean that the individual has an incentive to save. The overall tax advantage and the incentive to save are two different measures.

The incentive to save is measured by the after-tax rate of return. A tax system is neutral when the way present and future consumption is taxed makes the individual indifferent between consuming and saving. This is achieved when the after-tax rate of return is equal to the before-tax rate of return.

Taxing returns creates a disincentive to save because the present value of the income is greater if it is used for consumption today than if it is used for consumption tomorrow (Mirrlees et al., 2011^[4]). The tax regime that applies to most traditional forms of savings (“TTE”) therefore reduces the incentive to save.

Therefore, the tax treatment of retirement savings may lead to a positive overall tax advantage independently of whether the individual has an incentive to save, is indifferent between saving and consuming, or has an disincentive to save (i.e. the after-tax rate of return may be larger, equal or lower than the before-tax rate of return).

As PAYG public pension systems are under increasing strain due to population ageing and financial sustainability concerns, the tax treatment of retirement savings should at least not discourage savings. It may even be justifiable to incentivise retirement savings more for certain groups of individuals, in breach of tax neutrality. Interactions with the public pension system and the general tax system should also be carefully analysed. People will refrain from saving for retirement if doing so reduces their entitlements to public pensions or other forms of tax relief.

A number of different designs can reach tax neutrality between saving and consuming under certain assumptions. Taxing retirement savings upon withdrawal (“EET”) achieves tax neutrality provided that the individual faces a constant personal income tax rate over time. Upfront taxation of retirement savings (“TEE”) also achieves tax neutrality as long as returns are not above the “normal return to saving”. The normal return to saving is the return that just compensates for delaying consumption. It is also often called the risk-free return (Mirrlees et al., 2011^[4]).

Taxing retirement savings upon withdrawal is likely to breach tax neutrality and to provide incentives to save, in particular for middle to upper-middle income groups. Retirement income is usually lower than income from work, hence retirement income is likely to be taxed at a lower average rate than income from work. In that case, the tax paid on withdrawals may not compensate fully for the initial tax relief on contributions and the overall tax advantage is larger. This also means that the tax regime favours saving over consuming. This is illustrated in Figure 7.1. The dashed line represents the situation when individuals face a constant personal income tax rate over time, implying that the “EET” tax regime achieves tax neutrality for all income groups. The solid line shows that, when individuals face a lower tax rate in retirement than while working, the “EET” tax regime provides an incentive to save as the overall tax advantage exceeds the one

achieved with tax neutrality, in particular for middle to upper-middle income earners. For high-income earners, there is a convergence towards tax neutrality because the higher is the income, the less likely is the individual to experience a fall in tax rate at retirement.

Figure 7.1. Overall tax advantage for the “EET” tax regime by income level, according to the relationship between tax rates on work income and retirement income

Present value of taxes saved over a lifetime, as a percentage of the present value of contributions



It should be noted that tax neutrality does not imply that the tax expenditure related to tax incentives for retirement savings will be equally distributed among different income groups. Tax neutrality only implies that the after-tax rate of return is equal to the before-tax rate of return for all income groups, creating no distortion between present and future consumption.

Tax expenditures related to the tax treatment of retirement savings will tend to be concentrated on high-income individuals for three main reasons. First, in voluntary pension systems, high-income earners are more likely to participate in private pension plans than other income groups, reflecting their higher propensity and capacity to save. Second, their higher income results in a greater value of the tax relief per household even when the tax rate is the same for everyone. Third, in tax systems where tax rates increase with taxable income, high-income earners face the highest marginal tax rates, thereby benefiting more on every unit of the flows that attract tax relief.

7.4. Countries with an “EET” tax regime already in place should maintain the structure of deferred taxation

The most common tax treatment of retirement savings exempts contributions and returns on investment from taxation, and taxes pension benefits and withdrawals as income. Half of the OECD countries currently apply a variant of the “EET” tax regime. The other half is split across five other tax regimes.

This tax regime always generates a long-term fiscal cost to the government. In mature pension systems, taxes collected on withdrawals are large and therefore fiscal costs are lower. The introduction of pension arrangements with an “EET” tax treatment leads to a sharp increase in the net tax expenditure that arises from comparing against a “TTE” benchmark tax treatment, as no one initially receives pension benefits (i.e. no tax revenues on withdrawals) while participants make tax-deductible contributions and start

accumulating assets tax free. Over time, however, former contributors become retirees and receive pension benefits on which they pay taxes, thereby reducing the net tax expenditure. Once the system has reached maturity, i.e. all retirees draw their pension based on a full career and constant contribution rules, the net tax expenditure stabilises at its steady-state level. That level is positive as taxes collected on withdrawals are lower than tax revenues forgone on contributions and on accrued income, implying a long-term fiscal cost for the government. However, the size of withdrawals in a given year exceeds the size of contributions, as withdrawals are the result of several years of contributions accumulating with compound interests. Taxes collected on withdrawals each year therefore more than compensate for tax revenues forgone on contributions (Chapter 5).

Countries already using the “EET” tax regime should therefore maintain the structure of deferred taxation. The upfront cost incurred at the introduction of the funded pension system is already behind and the rewards in the form of increased tax collection on pension income are in the horizon. As societies continue to age, these larger tax revenues may additionally help cope with increased pressure on public services.

Policy proposals to modify the “EET” tax regime on retirement savings should consider the short-term and long-term impacts on the fiscal cost. Chapter 6 shows that different tax treatments that provide the same overall tax advantage to the individual can have different implications on the fiscal cost. For example, switching from taxation upon withdrawal (“EET”) to upfront taxation (“TEE”) would reduce the fiscal cost in the short term but actually increase it in the long term. At the time of the switch, the fiscal cost drops significantly as contributions stop being tax deductible and the current generation of retirees pay taxes on their pension benefits because they have contributed under the “EET” tax regime. Over time, however, tax revenues collected on withdrawals decline as new generations of retirees have contributed under the “TEE” tax regime. This increases the fiscal cost up to a level that is higher than just before the switch, because taxes collected on withdrawals under a mature “EET” tax regime are higher than taxes collected on contributions under a mature “TEE” tax regime.

7.5. Countries should consider the fiscal space and demographic trends before introducing a new retirement savings system with financial incentives

The total fiscal cost of financial incentives varies greatly across countries, but remains in the low single digits of GDP. Chapter 5 estimates the current and future profile of the net tax expenditure related to private pensions in Australia, Canada, Chile, Denmark, Iceland, Latvia, Mexico, New Zealand, the Slovak Republic and the United States.² The net tax expenditure in a given year is measured as the net amount of personal income tax revenues forgone on contributions, revenues forgone on accrued income and revenues collected on withdrawals that arise when comparing with the tax treatment of traditional savings accounts (“TTE”). It adds to direct spending associated with non-tax incentives, when relevant, in order to estimate a total fiscal cost. The fiscal cost varies from 2%-3% of GDP in Australia and Iceland to 0.1%-0.3% of GDP in Chile, Mexico, New Zealand and the Slovak Republic, and it even turns negative in Denmark, indicating an overall positive fiscal effect in the future.

In addition, the fiscal cost evolves over time and depends on the level of maturity of the pension systems and the age profile of the total population of the country.

A mature pension system is one in which current retirees draw their pension based on a full career and constant contribution rules. Individuals who were already in the labour

market when a new pension system was introduced will draw their pension on a part of their career only. Similarly, if the contribution rate to the system changes, it will take some time to see retirees drawing their pension based on the new contribution rate during their entire career.

The maturing phase may cause the fiscal cost to deviate from its long-term steady-state level. During the maturing phase, aggregate asset and benefit levels increase over time until they reach a stable level (steady state). However, there is a lag in the growth of benefits behind that of assets and investment income. Depending on which flows are taxed, this lag may create temporary increases or decreases in the net tax expenditure before it reaches its steady-state level. For example, all tax regimes that tax pension benefits (e.g. “EET”, “ETT”, “TET”) will create a hump shaped net tax expenditure during the maturing phase of the pension system because, as the density of contributions progresses, asset and investment income levels grow and so do, with a lag, benefit levels and their associated tax collection.

Demographics also affect the fiscal cost related to financial incentives because cohorts of different sizes modify the flows and stocks in the pension system. When there is a population bulge, the new larger cohorts entering the labour market raise the aggregate levels of earnings, GDP and contributions. Asset levels increase only with a lag. When those larger cohorts retire, it is the aggregate level of benefits that increases. The different flows and stocks in the pension system go back to their initial level when all the individuals in the larger cohorts have passed away. The changes in the levels of contributions, assets, investment income and benefits will affect the net tax expenditure, and depending on which flows are taxed, the net tax expenditure may be temporarily above or below its steady-state level.

Countries introducing a new retirement savings system with financial incentives should therefore consider the fiscal space and demographic trends. The fiscal space will determine how generous the financial incentives can be, as different approaches to designing financial incentives will produce a different fiscal cost (Chapter 6). In addition, as the pension system matures, the fiscal cost will develop differently depending on the tax regime chosen before reaching its steady state. For example, countries should be aware that introducing a pension system where only withdrawals are taxed will create a larger upfront fiscal cost. This needs to be fully disclosed and accounted for when introducing reforms to avoid creating a political backlash, especially in times of economic crises. Finally, demographic trends matter as they may temporarily inflate or deflate the fiscal cost.

7.6. Identifying the retirement savings needs and capabilities of different population groups could help countries to improve the design of financial incentives

The role of supplementary pension schemes has evolved over time. Historically, public PAYG pension schemes played a predominant role in retirement income provision in most jurisdictions. Supplementary funded pension schemes were mostly for high-income earners who wanted to top up their public pension to maintain their standard of living in retirement. The relative importance of PAYG and supplementary funded pension schemes has been changing over time. Concerns over both the financial sustainability and the retirement adequacy of pension systems lead many countries to reduce the generosity of public pension schemes (e.g. increase in the retirement age, less generous indexation mechanisms) and to strengthen the role of supplementary funded pension schemes (OECD, 2015^[5]). As a result, the design of financial incentives to promote supplementary funded pension schemes should evolve and adapt to the needs of a broader and more diverse population.

Specific financial incentives to encourage poor individuals to contribute voluntarily to a supplementary funded pension scheme are not likely to be necessary. Workers whose income is below or around the poverty line cannot afford to save in supplementary funded pension schemes. At retirement, they will rely on the public pension scheme only and the safety net should prevent them from falling into poverty.

The situation may be different for mandatory pension systems when the labour market is highly informal. Chile and Mexico for example provide government subsidies for people contributing to their individual pension accounts. Although both systems are mandatory for employees, large labour informality prevents universal coverage. As informality is more widespread among low-income workers, financial incentives target those workers in order to increase their contribution densities.

Financial incentives should adapt to the savings needs of different groups of individuals. In many countries, public pensions are calculated according to a defined benefit formula that delivers different replacement rates to different income groups. Individuals whose replacement rate does not permit them to maintain their standard of living in retirement should save more in supplementary pension schemes. Financial incentives may need to be higher for those with higher savings needs.

Granting financial incentives to high-income earners may be controversial. High-income earners usually get the lowest replacement rates from public PAYG pension schemes. They need to save to complement their public pension and maintain their standard of living. Should they get financial incentives to do so? On the one hand, high-income earners probably do not need to get financial incentives to save. They have a higher propensity to save than other income groups and will save whatever the tax treatment applied to the savings vehicle. Moreover, they tend to shift their savings from non-tax-favoured to tax-favoured vehicles rather than creating new savings, as shown in Chapter 4. On the other hand, policy makers may want to make sure that more savings are earmarked for retirement and allocated to long-term investments. In addition, countries may want to treat all retirement savings, whether through PAYG or funded pension arrangements, equally with respect to the tax code.³ Following these arguments, tax regimes that reach tax neutrality could be used to equalise the incentive to save across all income groups. These do not grant excessive tax advantages to high-income earners (Figure 7.1), provided that the interaction with the personal income tax system is taken into consideration when designing the incentive (e.g. the “EET” system grants a higher incentive to save to middle and upper-middle income earners when their marginal income tax rate falls at retirement). In addition, limits to the amount of contributions attracting tax relief should be established to restrict the possibility of using retirement savings plans as tax optimisation tools.

7.7. Tax credits, fixed-rate tax deductions or matching contributions may be used when the aim is to provide an equivalent tax advantage across income groups

In some countries, policy makers may consider that most individuals should get an equivalent overall tax advantage because savings needs are similar across the population. For example, when the mandatory pension system is defined contribution in nature (either financial and notional), replacement rates are equal across a large range of income levels, so that most individuals have the same needs to save in supplementary funded pension schemes to complement their mandatory pension.

Tax deductions at fixed rate and tax credits are alternatives to tax deductions at the marginal rate that achieve a smoother distribution with income. As shown in Figure 7.1, the “EET” tax regime provides a larger overall tax advantage to middle and upper-middle income earners. It is possible to adjust the “EET” tax regime by changing the tax treatment of contributions to reach a smoother distribution of the overall tax advantage by income. Tax deductions at fixed rate and tax credits can be used to achieve this. They provide the same tax relief on after-tax contributions to all individuals, independent of their income level and marginal income tax rate. Both approaches are strictly equivalent when the tax credit is refundable. When the tax credit is non-refundable, individuals who pay no or little income tax do not get the tax credit or not in full, respectively.

Compared to tax deductions at the marginal rate, tax deductions at fixed rate and tax credits typically reduce the overall tax advantage for high-income earners and increase it for low-income earners (Chapter 6). The number of winners and losers depends on how high the level of the credit rate or deduction rate is set. The lower the credit rate, the higher the number of individuals worse-off from a reduction in the overall tax advantage and the lower the number of individuals benefitting from an increase in the overall tax advantage. The reduction in the overall tax advantage can still be achieved without removing the incentive to save to any individual. As seen previously, with the “EET” tax regime, middle to upper-middle income earners get an overall tax advantage that is above tax neutrality. There may be room therefore to reduce their overall tax advantage without completely removing their incentive to save.

The structure of tax declaration and tax collection may influence individuals’ perception of tax credits and tax deductions and lead to different levels of savings. For example, when pension contributions are deducted from pay before calculating and paying personal income tax, the tax relief is provided automatically and saved in the pension account. This may not be the case when tax deductions and tax credits need to be claimed through the income tax declaration. When contributions are first taxed at the individual’s marginal rate, the tax refund (fixed rate of deduction or tax credit) may be provided later in the year or even the following year to the individual. If individuals anticipate that they will eventually get a tax refund, they can increase their after-tax contribution to save the whole tax relief in the pension account. However, if they do not anticipate it, the after-tax contribution may not be as high as with an automatic direct tax deduction.

Another approach to smoothing out the overall tax advantage across income groups is to combine the “EET” tax regime with matching contributions. Policy makers should keep in mind the starting point when designing financial incentives. Most OECD countries already have tax incentives in place, in particular the “EET” tax regime. Introducing matching contributions when retirement savings already enjoy an “EET” tax regime would be a practical solution to smooth out the overall tax advantage across income groups. Indeed, it would increase the tax advantage on contributions for all earners in the same proportion (equivalent to the match rate). At the same time, it would increase assets accumulated, pension benefits and the amount of tax due on the latter. That increase in tax due on withdrawals would hit higher-income earners harder, as they are the ones subject to the highest marginal tax rates. All in all, the introduction of a matching contribution would increase the overall tax advantage for all individuals, but less so for high-income earners. It therefore helps to achieve a smoother tax advantage across income groups (Chapter 6). It would however incur an additional fiscal cost. In the long run, this additional cost would be smaller than the direct spending on the matching contribution, as it is partially compensated by an increase in taxes collected on the higher withdrawals.

7.8. Non-tax incentives, in particular fixed nominal subsidies, may be used when low-income earners save too little compared to their savings needs

In some countries, low-income earners above the poverty line may not qualify for the safety net when they retire and find themselves with replacement rates too low to maintain their standard of living. In that case, policy makers may want to target those individuals to receive a greater incentive to contribute to supplementary funded pension schemes in order to encourage them to complement their public pension.

Non-tax financial incentives are better tools to encourage retirement savings among low-income earners for several reasons.

First, low-income earners are not very sensitive to tax incentives. Besides the fact that low-income earners may lack sufficient resources to afford contributions, they may not have enough tax liability to fully enjoy tax relief and they are more likely to lack adequate understanding of tax-related issues. As shown in Chapter 4, among low-income earners, the combination of a progressive tax system and tax-deductible contributions may not encourage retirement savings. Carbonnier, Direr and Slimani Houti (2014^[6]) find that low-income earners aged 45 to 55 do not increase their contribution level when their marginal tax rate increases. This suggests that the structure of the income tax system is not the main factor for low-income earners in deciding about their contribution level.

Second, non-tax incentives are not linked to the individual's tax status, making them attractive for all individuals. Matching contributions and fixed nominal subsidies are payments made directly by the government into the pension account of eligible individuals. As non-tax incentives are not linked to the individual's tax status, the value of the incentive is not limited by the tax liability.⁴ Therefore all individuals can fully benefit from them as long as they fulfil the entitlement requirements (e.g. having an income below a certain level, contributing a certain proportion of income). Non-tax incentives can also be used to target disadvantaged groups, such as young workers or women.

Third, non-tax incentives are automatically saved into the pension account, while this may not be the case with tax incentives. Non-tax incentives are indeed directly invested in the pension plan, therefore increasing the assets accumulated at retirement and thus future pension benefits. By contrast, individuals eligible for a tax credit or a tax deduction (when for example it needs to be claimed) may not save the value of the tax incentive in the pension account if they do not increase their after-tax contributions in anticipation of the receipt of the tax refund.

Fourth, the design of matching contributions and fixed nominal subsidies makes them ideal tools to target low-income earners. Fixed nominal subsidies naturally provide a higher overall tax advantage to low-income earners as the value of the subsidy represents a higher share of their income. This applies independently of the structure of the personal income tax system (higher tax rates for higher taxable income or fixed tax rate). In all countries using this approach, the subsidy is used as a complement to tax incentives, so that all income groups get an overall tax advantage when contributing to a supplementary funded pension scheme, with an extra encouragement for low-income earners. Targeted matching contributions and capped matching contributions can achieve similar results. In addition, matching contributions alone (i.e. associated with the "TTE" tax regime) also provide larger incentives to low-income earners. This approach provides an overall tax advantage that declines with income because the match rate applies on after-tax contributions and the additional investment income generated by the matching

contributions is taxed. The reduction in the overall tax advantage may, however, remove the incentive to save for high-income earners.

7.9. Countries using tax credits may consider making them refundable and converting them into non-tax incentives

Refundable tax credits are more attractive for low-income earners. Tax credits should be refundable when the policy objective when introducing a tax credit is to provide the same tax relief to all individuals on their contributions. With non-refundable tax credits, individuals with low or no income tax liability only get, respectively, part of the tax credit or nothing. By contrast, individuals with a low tax liability can still benefit from refundable tax credits as the difference between the value of the credit and the tax liability is paid to the individual.

In addition, the value of the tax credit could be paid directly into the pension account (converting the tax credit into a non-tax incentive) to help individuals to build larger pots to finance retirement. As seen previously, individuals may not save the value of the tax credit in their pension account as the tax credit is usually received well after contributions were made and taxed.

Moreover, people may be more responsive when the incentive is framed as a matching contribution rather than as a tax credit. Saez (2009^[7]) shows that individuals receiving a 50% matching contribution participate more in retirement savings plans and contribute more than individuals receiving an equivalent incentive framed as a 33% tax credit.⁵ The results imply that taxpayers do not perceive the match and the tax credit to be economically identical. Some individuals may have perceived the 33% credit rate as equivalent to a 33% match rate, thereby reducing the incentive. Another explanation could be linked to behavioural factors. Individuals had to wait for two weeks to receive the credit rebate, and due to loss aversion, contributing, for example, USD 450 and then receiving USD 150 back may feel more painful than contributing just USD 300 and obtaining a match of USD 150 to reach the same USD 450 total contribution.

7.10. Countries where pension benefits and withdrawals are tax exempt may consider restricting the choice of the post-retirement product when granting financial incentives

Early withdrawals and lump sum payments may be inconsistent with granting financial incentives to promote savings for retirement. When financial incentives aim at encouraging people to complement their public pension by saving in a supplementary funded pension scheme, certain withdrawal options may be inappropriate. For example, early withdrawals will eventually reduce the level of the supplementary funded pension, possibly reducing overall retirement income. Moreover, lump sum payments may be used for other purposes than financing a supplementary funded pension. Lump sums may however improve the financial situation of retirees when they are used to pay off a debt for example, but at the cost of reducing overall retirement income and potentially affecting its adequacy.

Taxing pension benefits discourages early withdrawals and lump sum payments when the amounts received are added to the individuals' earnings and taxed at their marginal rate. Early withdrawals when the individual is still working and earning work income may therefore push taxable income into a higher tax bracket. In the same way, lump sum

payments may represent large amounts that fall into a higher tax bracket than regular pension payments (annuities or programmed withdrawals). Some countries like Ireland and the United Kingdom tax lump sums only partially in order to reach a more neutral tax treatment across the different post-retirement products. However, the majority of countries taxing retirement benefits apply the same tax treatment across the different types of post-retirement product, i.e. life annuity, programmed withdrawal or lump sum, thereby discouraging lump sum payments (Chapter 2).

By contrast, when withdrawals are tax exempt, individuals are not penalised for withdrawing early or choosing a lump sum. This may defeat the purpose of encouraging people to save in supplementary funded pension schemes in order to complement their public pension.

In this context, several measures could be used to restrict the choice of the post-retirement product. For example, Chapter 2 shows that some countries provide tax relief on contributions conditional on people complying with certain rules, such as contributing for a minimum period (e.g. Belgium, Estonia and Luxembourg), not retiring before a certain age (e.g. Belgium, Finland, Germany, Luxembourg and Sweden) or taking benefits in a certain form (e.g. Finland, Germany, Portugal and Sweden). Other countries take back some of the subsidies in the case of early withdrawals (e.g. Turkey) or lump sum payments (e.g. Austria, Chile). An alternative option is to incentivise people to annuitize their pension income through a more favourable tax treatment for annuities as compared to programmed withdrawals and lump sums (e.g. the Czech Republic, Estonia and Korea) or through a government subsidy (e.g. Turkey).

7.11. Countries need to regularly update tax-deductibility ceilings and the value of non-tax incentives to maintain the attractiveness of saving for retirement

Ceilings on tax-deductible contributions are common in OECD countries and cap the amount contributed by high-income earners. Limits to the amount of contributions attracting tax relief can be defined as a proportion of the contributor's income up to a nominal ceiling, or as a fixed nominal amount, usually a multiple of a reference value in the country (Chapter 2). When excess contributions are allowed, they are usually taxed at the individual's marginal tax rate. In some countries, tax penalties also apply for excess contributions unless the individual withdraws the amount in excess of the ceiling. This creates a strong disincentive for high-income earners to contribute above the ceiling and de facto caps their contributions.

Tax-deductibility ceilings for contributions tend to be updated yearly only in line with price inflation, if at all. When wages grow faster than inflation, not indexing tax-deductibility ceilings, or indexing only in line with inflation, increases the proportion of individuals reaching the ceiling over time and reduces their contributions to retirement plans. This may be inconsistent with the policy objective of helping people to improve their chances of obtaining a higher retirement income by saving in supplementary funded pension schemes.

Similarly, keeping the value of non-tax incentives constant over time may reduce the attractiveness of saving for retirement and lower the positive impact on participation. Most countries providing matching contributions and fixed nominal subsidies do not update the maximum contribution and subsidy value on a yearly basis. In economies with growing wages, this implies that the value of the incentive represents a lower share of people's income over time. Regular updates are therefore needed to keep the incentive at least constant.

Notes

¹ The incentive to save is measured by the after-tax rate of return. A tax system is neutral when it does not distort an individual's choice between present and future consumption. This is achieved when the after-tax rate of return is equal to the before-tax rate of return. With the "TTE" tax regime, the after-tax rate of return is lower than the before-tax rate of return. This reduces the incentive to save as the present value of the income is greater if it is used for consumption today than if it is used for consumption tomorrow.

² Only a limited number of countries is included in the analysis, as the calculations require a large amount of data.

³ Another argument for granting financial incentives to high-income earners could be the desire to maintain the social contract that supports the poverty alleviation functions of public pension schemes.

⁴ Refundable tax credits can replicate the economic effects of non-tax incentives, as long as they are refunded directly into a pension account.

⁵ A credit rate of t is economically equivalent to a match rate on the contribution of $t/(1-t)$. For example, a 25% refundable tax credit is economically equivalent to a matching contribution of one-third. This is because the tax credit rate is expressed as an inclusive rate (i.e. including the value of the credit), while the match rate is expressed as an exclusive rate (i.e. excluding the value of the matching contribution).

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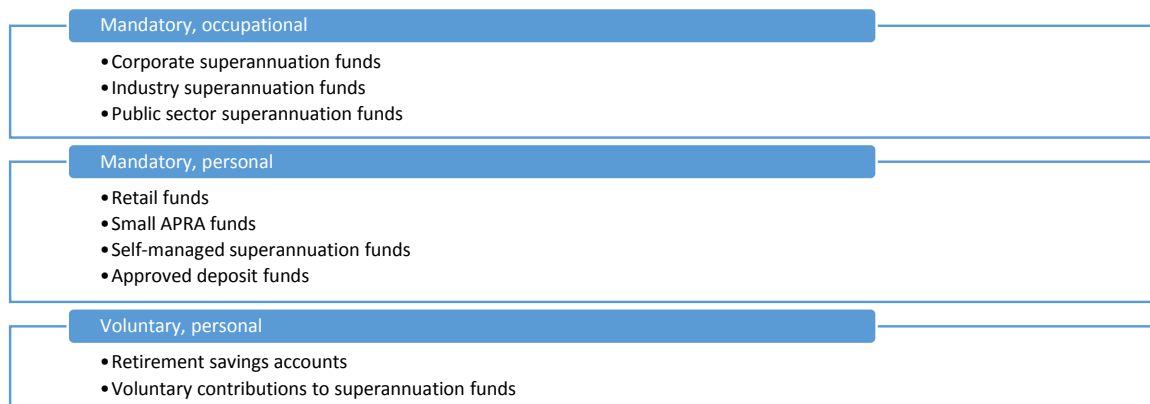
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Annex A. Country profiles

This annex provides detailed information about how OECD and selected non-OECD countries design financial incentives to promote savings for retirement. Each country profile includes the following sections: i) the structure of the funded private pension system; ii) the tax treatment of retirement savings (contributions, returns on investment, funds accumulated and pension income); iii) the description of non-tax incentives; iv) the social treatment of contributions and benefits; v) the tax treatment of pensioners; and vi) the incentives for employers.

Australia

Structure of the funded private pension system



Tax treatment of contributions

Contributions are taxed, but usually at a lower rate than the individual's marginal income tax rate. There are two main types of contributions with different tax treatments: "concessional" or before-tax contributions and "non-concessional" or after-tax contributions.¹ The government also makes tax-exempt contributions to eligible individuals.

Concessional contributions

Concessional contributions include mandatory employer contributions ("superannuation guarantee" contributions), employee "salary sacrifice" contributions and voluntary deductible contributions.² The superannuation guarantee contribution is paid regardless of age. However, individuals between 65 and 74 years of age may only make voluntary deductible contributions if they satisfy a "work test". Individuals aged over 75 cannot make voluntary deductible contributions.

Concessional contributions are taxed at 15% on amounts up to the concessional contributions cap. In 2017-18, this cap is AUD 25 000. It is indexed to wages. From 1 July 2018 it is possible for individuals with balances of less than AUD 500 000 to carry-forward up to 5 years unused concessional cap space.

Contributions over the concessional contributions cap are taxed at the individual's marginal income tax rate. The individual also has to pay the excess concessional contribution (ECC) charge on the increase in the tax liability to neutralise the benefit of having excess contributions in the concessional environment. To reduce the tax liability, the individual receives a non-refundable tax offset equal to the 15% tax already paid by the fund on the excess amount. Any contributions over the cap count towards the individual's non-concessional contributions. The individual may choose to withdraw up to 85% of the excess concessional contributions from the superannuation fund to help pay the income tax. Any excess concessional contributions withdrawn no longer count towards non-concessional contributions cap.

For high-income earners, with an adjusted taxable income of more than AUD 250 000, the tax rate on concessional contributions that are considered above the AUD 250 000

threshold is 30% instead of 15%. The additional tax is imposed on the whole amount of the contributions, up to the concessional cap, if salary and wages are above the threshold. Otherwise, the additional tax is only imposed on the portion of the contribution that takes the individual over the threshold. If the adjusted taxable income is less than AUD 250 000, but adding concessional contributions brings the total above that threshold, the 30% tax rate applies only to the part of the contribution above the threshold. For example, if your income is AUD 230 000 and your concessional contributions are AUD 25 000, you only pay the 30% tax rate on AUD 5 000.

Non-concessional contributions

Non-concessional contributions primarily include personal voluntary contributions (which can be made as after-tax additional contributions), spouse contributions and other contributions made by one person on behalf of another person where there is no employment relationship. Excess concessional contributions not withdrawn from the fund are also included in the calculation of non-concessional contributions.

Non-concessional contributions are not taxed upon entry into the fund because they are made from money on which the individual has already been taxed at his/her marginal rate. The non-concessional contributions cap is the limit on the amount of non-concessional contributions an individual can make each year before paying extra tax. In 2017-18, this cap is AUD 100 000. Only individuals with a total superannuation balance of less than AUD 1 600 000 are permitted to make non-concessional contributions. The cap is indexed to wages.

Any non-concessional contributions above the cap in a given year automatically bring forward the next two years' non-concessional contributions cap for people under 65 years old. This means that an eligible individual can contribute up to AUD 300 000 over a three-year period without paying the excess contributions tax. Any contributions above AUD 300 000 in that three-year period can remain in the superannuation fund and be taxed at 49%, or be withdrawn from superannuation to avoid that additional tax, and only pay tax at an individual's own marginal tax rate on an earnings amount associated with the excess contributions.

Individuals aged between 65 and 74 are eligible to make annual non-concessional contributions of AUD 100 000 if they meet the work test (that is, they work 40 hours within a 30 day period each income year), but are not able to access the bring-forward of contributions.

A tax offset (called Spouse Super Contribution Tax Offset) may apply to after-tax contributions made on behalf of non-working or low-income-earning spouses.³ It is payable to the contributor (not the spouse). The tax offset is calculated as 18% of the lesser of:

- AUD 3 000, reduced by one dollar for every dollar that the sum of the spouse's income, total reportable fringe benefits and reportable employer superannuation contributions exceeds AUD 37 000; and
- the total amount of contributions paid.

State contributions

The government provides a low-income super tax offset (LISTO) of up to AUD 500 annually for eligible individuals on adjusted taxable income of up to AUD 37 000. The amount payable is calculated by applying a 15% match rate to concessional contributions

made by, or for individuals (it is effectively a refund of the tax paid on concessional contributions). This contribution is tax exempt.

Tax treatment of returns on investments

Investment earnings on superannuation assets in the accumulation phase are taxed at a rate of 15%.

People who have reached preservation age but are under 65 and not retired can still access a transitional super income stream (TRIS) but earnings on the amount supporting it will be taxed at 15%.

Funds are eligible for imputation credits for dividend income and a one-third capital gains tax reduction on assets held for at least 12 months.

Tax treatment of funds accumulated

From 1 July 2017, the transfer balance cap imposes a lifetime limit of AUD 1 600 000 on the amount of superannuation assets that may be transferred to a retirement phase account (i.e. an account supporting retirement income streams) with tax-free investment earnings. Assets in excess of the AUD 1 600 000 transfer balance cap must be rolled back to an accumulation phase account (where investment earnings will be taxed at 15%) or withdrawn from superannuation. The transfer balance cap is indexed in line with the consumer price index and increases in AUD 100 000 increments. The transfer balance cap applies only to the amount of assets that may be transferred into a retirement phase account. The value of retirement phase accounts may grow above AUD 1.6 million if future earnings exceed withdrawals.

Transfers in excess of AUD 1 600 000 are subject to excess transfer balance tax. This is a tax on notional earnings attributed to the excess. The tax is 15% in 2017-18. From 2018, the rate is 15% the first time an individual has an excess transfer balance and 30% for second and subsequent breaches.

Tax treatment of pension income

Benefits withdrawn from a superannuation fund have three components: a tax-free component, a taxed element and an untaxed element. Non-concessional (after-tax) contributions are tax-free when withdrawn from the superannuation account. Concessional (before-tax) contributions are taxable when withdrawn. If the superannuation fund has paid taxes on those contributions (as described earlier), this corresponds to the taxed element. If the fund has not paid taxes, this corresponds to the untaxed element.

Individuals do not pay tax on the tax-free component when they withdraw it, regardless of their age or the type of withdrawal. The tax treatment of the taxable component (taxed element and untaxed element) depends on the age at which the individual retires and the type of withdrawal, as described in the tables below. The preservation age is the age at which individuals can access their superannuation assets if they are retired. It depends on the date of birth (55 years old for people born before 1 July 1960, increasing gradually to 60 for people born from 1 July 1964).

Table A A.1. Australia: Tax on withdrawals of taxable component when the individual withdraws money before his/her preservation age

Component	Type of withdrawal	Effective tax rate (excluding Medicare levy)
Taxed element	Income stream	Individual's marginal tax rate
Taxed element	Lump sum	Individual's marginal tax rate or 20%, whichever is lower
Untaxed element	Income stream	Individual's marginal tax rate
Untaxed element	Lump sum	Individual's marginal tax rate or 30%, whichever is lower, or 45% for lump sums above the untaxed plan cap amount (AUD 1 445 000 in 2017-18).

Table A A.2. Australia: Tax on withdrawals of taxable component when the individual withdraws money between his/her preservation age and 60 years old

Component	Type of withdrawal	Effective tax rate (excluding Medicare levy), up to the low rate cap amount (AUD 200 000 in 2017-18)	Effective tax rate (excluding Medicare levy), above the low rate cap amount (AUD 200 000 in 2017-18)
Taxed element	Income stream	Individual's marginal tax rate less 15% tax offset	Individual's marginal tax rate less 15% tax offset
Taxed element	Lump sum	0%	Individual's marginal tax rate or 15%, whichever is lower
Untaxed element	Income stream	Individual's marginal tax rate	Individual's marginal tax rate
Untaxed element	Lump sum	Individual's marginal tax rate or 15%, whichever is lower	Individual's marginal tax rate or 30%, whichever is lower, or 45% for lump sums above the untaxed plan cap amount (AUD 1 445 000 in 2017-18)

Table A A.3. Australia: Tax on withdrawals of taxable component when the individual withdraws money at age 60 or more

Component	Type of withdrawal	Effective tax rate (excluding Medicare levy)
Taxed element	Income stream	No tax up to AUD 100 000 per year while 50% of amounts over AUD 100 000 taxed at individual's marginal tax rate
Taxed element	Lump sum	No tax
Untaxed element	Income stream	Individual's marginal tax rate less 10% tax offset (capped at AUD 10 000)
Untaxed element	Lump sum	Individual's marginal tax rate or 15%, whichever is lower, or 45% for lump sums above the untaxed plan cap amount (AUD 1 445 000 in 2017-18)

Non-tax incentives

The state helps low-to-middle income earners to boost their retirement savings through the “super co-contribution”. This contribution is tax-exempt. The super co-contribution is a government matching contribution for eligible individuals. Individuals younger than 71 are eligible for a super co-contribution if they make a voluntary non-deducted contribution (in their own name) in the income year, have a total income lower than the higher income threshold (AUD 51 813 for 2017-18), at least 10% of their total income is from employment or business and their total superannuation balance is less than AUD 1 600 000. The match rate is up to 50%. Individuals with an income below the lower income threshold (AUD 36 813 for 2017-18) can get 50 cents for each dollar contributed, up to the full maximum entitlement (AUD 500 for 2017-18). For every dollar

that the individual earns above the lower income threshold, the maximum entitlement is reduced by 3.333 cents.

Social treatment

Social contributions are not levied on mandatory pension contributions.

Withdrawals from the taxed and untaxed elements before 60 years old are subject to Medicare Levy (2% since July 2014). After 60 years old, only withdrawals from the untaxed element are subject to Medicare Levy.

Tax treatment of pensioners

The public pension (Age Pension) is included in taxable income. The Age Pension is paid to people who meet age and residency requirements, subject to a means test.

Most senior Australians receive tax relief through the seniors and pensioners tax offset (SAPTO). SAPTO is available to taxpayers in receipt of a taxable Australian Government pension, as well as to Australians who are of Age Pension age and who meet all of the Age Pension eligibility criteria except the means test. In 2017-18, it is worth a maximum of AUD 2 230 for a single senior and AUD 1 602 for each member of a senior couple. It builds on the statutory tax-free threshold and the low income tax offset to ensure that eligible single senior Australians with a rebate income up to AUD 32 279 in 2017-18 (or AUD 28 974 for each member of a couple) pay no income tax or the Medicare levy. The tax offset cannot exceed the total tax paid.⁴

- For single individuals: the maximum offset is reduced by 12.5 cents for each dollar of rebate income in excess of AUD 32 279, cutting out at a rebate income of AUD 50 119.
- For couples: the maximum offset is reduced by 12.5 cents for each dollar of rebate income in excess of AUD 28 974 (AUD 57 948 of combined income), cutting out at a rebate income of AUD 41 790 (AUD 83 580 of combined income).

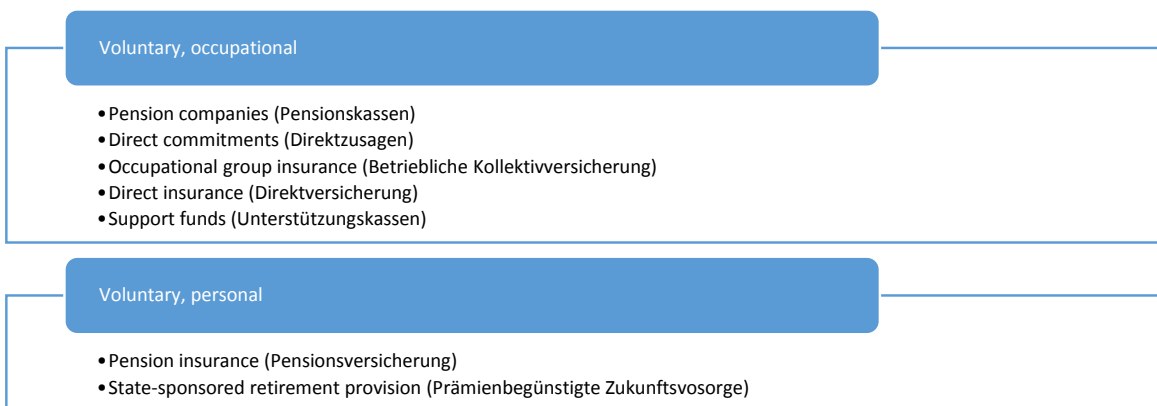
Incentives for employers to set up or contribute to a funded private pension plan

Employer superannuation guarantee contributions are deductible against corporate income tax.

Employers who fail to make the required contributions are subject to additional tax and penalties. This additional tax is the superannuation guarantee charge. It is paid to employees to compensate for non-payment of compulsory superannuation. The charge is higher than the basic superannuation requirement as it includes interest and administrative components. It is not deductible.

Austria

Structure of the funded private pension system



Tax treatment of contributions

Pension companies and occupational group insurance

Employee contributions are taxed at the individual's marginal income tax rate. They cannot exceed the sum of annual employer contributions (although an employee can contribute up to EUR 1 000 even when the employer contributes less than EUR 1 000 per year). These contributions are treated as special expenses.

25% of an individual's special expenses (individual private pension contributions plus other special expenses) are tax-deductible up to the limit of EUR 2 920 per year for a single person and EUR 5 840 if the spouse's income does not exceed EUR 6 000. If the annual salary exceeds EUR 36 400 these limits are gradually decreased and no tax-deductible special expenses can be claimed if the annual salary exceeds EUR 60 000. From 2016, special expenses are no more deductible for new pension contracts. For contracts concluded before 1 January 2016, the deductions continue to be applicable for a maximum period of 5 years.

Employer contributions are not considered as income for the employee.

An extra 2.5% insurance tax is levied on both employee and employer contributions.

Direct insurance

Employee contributions are taxed at the individual's marginal income tax rate. They cannot exceed the sum of annual employer contributions (although an employee can contribute up to EUR 1 000 even when the employer contributes less than EUR 1 000 per year). Contributions exceeding EUR 1 000 are treated as special expenses. From 2016, special expenses are no more deductible for new pension contracts. For contracts concluded before 1 January 2016, the deductions continue to be applicable for a maximum period of 5 years.

Employer contributions up to EUR 300 per year are tax-free for the employee. Contributions in excess of EUR 300 are considered as taxable income for the employee and can be considered as special expenses.

An extra 4% insurance tax is levied on both employee and employer contributions.

Direct commitments and support funds

Employees do not contribute. Employer contributions are not considered as income for the employee. The 4% insurance tax applies to support funds but not to direct commitments.

Personal pension plans

Contributions to personal pension plans are done from after-tax income (therefore they are taxed at the individual's marginal rate of income tax). These contributions are treated as special expenses and attract a 25% tax relief up to a limit. From 2016, special expenses are no more deductible for new pension contracts. For contracts concluded before 1 January 2016, the deductions continue to be applicable for a maximum period of 5 years.

There is no tax relief for state-sponsored retirement provision plans.

An extra 4% insurance tax is levied on individual contributions.

Tax treatment of returns on investments

Investment income is tax-exempt for pension companies, occupational group insurance, direct insurance, support funds and personal pensions.

Investment income is considered as company profit and subject to profit tax for direct commitments.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

The tax treatment of pension income depends primarily on the type of plan:

- Pension companies and occupational group insurance: Pensions are taxed as earned income at the individual's marginal rate of income tax. The portion of pension accrued by employer contributions is fully taxed. Only 25% of the portion of pension accrued by employee contributions is taxed.
- Direct insurance and personal pension insurance: Pensions are taxed as earned income at the individual's marginal rate of income tax from the moment the total value of benefits paid exceeds the capital value of the pension at retirement. It means that pension benefits are tax-free until that point in time.
- Direct commitments and support funds: Pensions are taxed as earned income at the individual's marginal rate of income tax.
- State-sponsored retirement provision: Withdrawals are tax-exempt if the entitlements are transferred to an occupational or personal pension plan or used to buy an annuity. If they are paid-out as a lump sum, the individual has to pay back 50% of the government subsidies and a 27.5% tax on capital gains.

Lump sum payments are taxed as ordinary income unless the payment does not exceed the amount of EUR 12 000. In this case, only 50% of the normal tax rate has to be paid. This applies to all lump sum payments which result from terminations of pension plans.

Non-tax incentives

The minimum term of a state-sponsored retirement provision plan is 10 years and only individuals not yet receiving social security pension benefits can open such plans. The plan must provide a capital guarantee. Personal contributions to a state-sponsored retirement provision plan can attract government matching contributions. The matching contribution rate corresponds to a fixed rate of 2.75% plus a variable rate depending on the annual general level of interest rate. For 2018, the variable rate is 1.5% (thus the total matching rate is 4.25%). As of 1 January 2018, the maximum personal contributions considered to calculate the government contribution is EUR 2 825.60 (thus the maximum government matching contribution for 2018 is EUR 120.09). No tax is levied on matching contributions. If the individual takes the benefits as a lump sum payment, s/he has to pay back 50% of the government subsidy and pay an additional 27.5% tax on the capital gains with retro-active effect.

It is also possible to get government matching contributions for employee contributions to direct insurance plans. The match rate is 2.75% plus a variable rate depending on the annual general level of interest rate for contributions up to EUR 1 000.

Social treatment

Social contributions are levied on employee/individual contributions but not on employer contributions.

Pensioners do not pay most social contributions but do pay for sickness insurance (5.1%).

Tax treatment of pensioners

Old-age public pension is considered as an income and subject to the individuals' marginal income tax rate.

Retired persons are entitled to a tax credit. For couples, the tax credit amounts to EUR 764 for sole earners with income up to EUR 19 930 and if the spouse's income does not exceed EUR 2 200. Otherwise the tax credit is EUR 400. The tax credit is linearly reduced to 0 between EUR 17 000 (EUR 19 930 for sole earners) and EUR 25 000 of income.

Additional voluntary contributions are possible in the public pension system (Höherversicherung) and lead to benefits taxed differently. Everyone with a public pension scheme can make additional contributions. Contributions can be defined by the individual. The contribution limit for 2018 is EUR 10 260. The contributions are deductible as special expenses up to the individual's personal limit. The additional amount granted in pension benefits by these additional contributions depends on the amounts contributed, gender, age at the time of the contribution and the age at retirement. 75% of these additional benefits are tax-exempt. 25% are taxed at the individual's marginal rate of income tax. Under certain conditions, benefits resulting from these contributions can be fully tax exempt, if they result from contributions up to EUR 1 000.

13th and 14th month pensions (Sonderzahlungen) attract a particular tax treatment. They are tax free up to an amount of EUR 620 per year. If the received amount is between

EUR 621 and the value of 2 times the average monthly gross pension income (max. EUR 2 100), there is no tax levied. If the value of 2 times the average monthly gross pension exceeds EUR 2 100, the amount between EUR 621 and EUR 2 100 is taxed at a fixed rate of 6%. If the amount received exceeds 2 times the average monthly gross pension, the excess amount is taxed at the individual's marginal income rate.

Incentives for employers to set up or contribute to a funded private pension plan

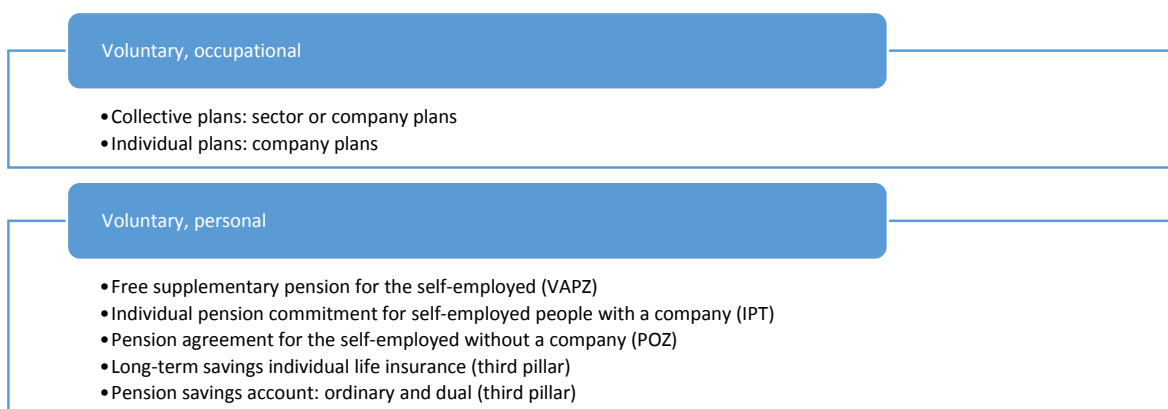
Pension companies and occupational group insurance: Employer contributions are tax-deductible company expenses, up to 10% of salary, provided that the total benefit target including social security benefits does not exceed 80% of current salary.

Direct insurance: Employer contributions up to EUR 300 per year are exempt from non-wage labour costs.

Direct commitments and support funds: Allocations to internal reserves are tax-deductible against income and corporation tax, up to 10% of salary, if the total benefit target including social security benefits does not exceed 80% of current salary.

Belgium

Structure of the funded private pension system



Tax treatment of contributions

Occupational pension plans

Employer contributions to an occupational pension plan are not considered as taxable income for the employee.

Employee contributions to an occupational pension plan are rare. They are eligible for a non-refundable tax credit of 30% of the amount contributed.⁵

Employee and employer contributions enjoy tax relief only to the extent that total retirement benefits, including the statutory pension, do not exceed 80% of the last gross annual salary.⁶

The employer must pay an annual 4.4% tax on the total contributions paid (employer plus employee) under group life insurance contracts. This tax is not due in the case of a

“social” pension scheme (i.e. a plan with solidarity components).⁷ It is not due either under institutions for occupational retirement provision (IORP).

Personal pension plans for the self-employed

There are three types of personal pension plans for the self-employed. VAPZ plans can be opened by any self-employed person. By contrast, only the self-employed with a company can open an IPT plan, while only those without a company can open a POZ plan.

Contributions to VAPZ plans are deductible from professional income. Contributions to VAPZ plans cannot exceed 8.17% of professional income, up to EUR 3 187.04 in 2018 (respectively 9.40% of professional income for “social” VAPZ plans, up to EUR 3 666.85).

Contributions to IPT plans are deductible from taxable income only to the extent that total retirement benefits, including the statutory pension, do not exceed 80% of the last gross annual salary. The self-employed individual must pay an annual 4.4% tax on the total contributions paid.

Contributions to POZ plans are eligible for a non-refundable tax credit of 30% of the amount contributed. The self-employed individual enjoys tax relief only to the extent that total retirement benefits, including the statutory pension, do not exceed 80% of the last gross annual salary. The self-employed individual must pay an annual 4.4% tax on the total contributions paid.

Third pillar personal pension plans

Individual contributions to third pillar pension plans are eligible for a non-refundable tax credit of 30% of the amount contributed.

In the case of pension savings accounts, the maximum contribution is EUR 960 per year in 2018. Alternatively, the individual may opt for a dual account, allowing for contributions up to EUR 1 230, with a tax credit of 25% (instead of 30%). The pension savings account shall have been subscribed by an individual aged 18 or over, but less than 65, and for at least 10 years.

In the case of long-term savings individual life insurance, contributions cannot exceed 6% of professional income, up to EUR 2 310 in 2018 (respectively 15% of professional income when professional income is no more than EUR 1 920 in 2018). The individual must pay an annual 2% tax on the total contributions paid. The insurance contract shall have been subscribed by an individual younger than 65, and for at least 10 years.

Tax treatment of returns on investments

Pension plans directly withhold a 9.25% profit sharing tax from the pension account. Pension savings accounts (third pillar) are exempted from profit sharing tax.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Occupational pension plans

The tax treatment of occupational pension income depends on the form of the pay-out option and the source of the contributions. In the case of a lump sum capital payment, the part of the capital that has accrued in respect of the employer's contributions is generally taxed at 16.5% (plus municipal tax). In case the individual withdraws from the statutory age of retirement (65 years old increasing gradually to 67) and remained active until that age, the tax rate is reduced to 10% (plus municipal tax).

The part of the capital that has accrued in respect of the employee's contributions is taxed at 10% (plus municipal tax) if withdrawn following death or retirement, and at age 62 (63 as of 2019) at the earliest (16.5% for the capital that has accrued in respect of contributions made before 1993).

Annuities are taxed at the individual's marginal rate of income tax. Annuities are rare in practice. Programmed withdrawals are not allowed in Belgium.

Personal pension plans for the self-employed

Upon withdrawal from VAPZ plans (from age 62 or 63 as of 2019), the accumulated capital is converted into a virtual income for tax purposes. The virtual income is then taxed at the individual's marginal income tax rate. The virtual income is determined by applying a conversion rate to the accumulated capital (between 4% and 4.5%) and has to be declared during a certain period (13 years, except when the individual withdraws from age 65, in which case, the declaration duration is only 10 years).

Withdrawals from IPT plans are generally taxed at 16.5% (plus municipal tax). In case the individual withdraws from the statutory age of retirement (65 years old increasing gradually to 67) and remained active until that age, the tax rate is reduced to 10% (plus municipal tax).

Withdrawals from POZ plans are taxed at 10% (plus municipal tax) if withdrawn following death or retirement, and at age 62 (63 as of 2019) at the earliest.

Third pillar personal pension plans

Third pillar pension plans are paid as a lump sum. That lump sum is taxed at the rate of 8% for pension savings accounts and 10% for long-term savings individual life insurance (no municipal tax). If the pension plan has been opened when the individuals was younger than 55, the tax is calculated on the capital accumulated until age 60. If the pension plan has been opened when the individuals was 55 or older, the tax is calculated on the capital accumulated when the contract reaches 10 years. Individuals can choose to withdraw the money when the anticipated tax is due, or to delay withdrawal and the payment of the tax when they get entitled to a pension (62 or 63 as of 2019). In the latter case, individuals can continue contributing after age 60 with no further tax due on the additional capital accumulated.

Non-tax incentives

No such incentives.

Social treatment

Employers must pay social contributions at the rate of 8.86% on their contributions to an occupational pension plan, which is lower than the usual rate for social contributions.

For the self-employed, social security contributions are not levied on contributions to IPT plans. They are levied on contributions to POZ plans. VAPZ contributions are considered as social contributions.

There is a special social contribution of 3% on the portion of contributions exceeding EUR 32 472 (for 2018) per year (so-called Wyninckx contribution). This applies to all plans except third pillar plans, but is mostly relevant for IPT plans.

Employee contributions to occupational plans and individual contributions to third pillar plans are treated in the same way as salary and are thus subjected to the same social contributions (13.07%).

Third pillar lump sums are not subject to social contributions.

Pensioners with a pension above a minimum threshold pay a social contribution of 3.55% for health and disability insurance. The minimum threshold is EUR 1 306.12 since 1 September 2010 for a single pensioner without dependents (EUR 1 517.60 for pensioners with dependents). The effect of the contribution cannot lead to a pension payment inferior to this monthly amount.

There is also a “solidarity” contribution levied on pension income exceeding EUR 2 478.95 per month. This contribution ranges from 0% to 2% of the gross pension.

Tax treatment of pensioners

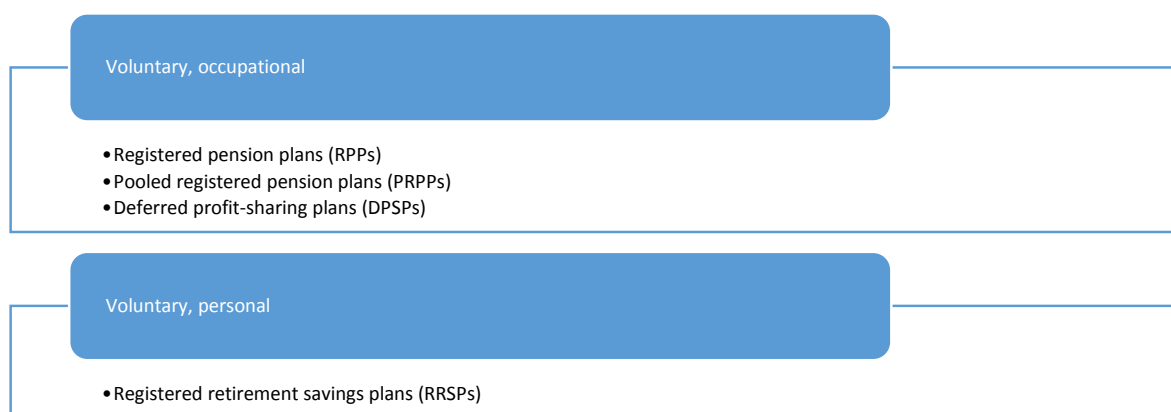
Public pension income is taxed at the individual’s marginal rate of income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions to an occupational pension plan are deductible as business expenses to the extent that total retirement benefits, including the statutory pension, do not exceed 80% of the last gross annual salary.

Canada

Structure of the funded private pension system



Tax treatment of contributions

Pension contributions made within the applicable limits are deductible from income.

There is a penalty tax of 1% per month for excess over-contributions made to an RRSP or a PRPP (i.e. contributions in excess of CAD 2 000 over the applicable RRSP/PRPP limit). Over-contributions, including those made within the CAD 2 000 over-contribution allowance, are not deductible from income.

Limits apply to contributions to RRSPs, PRPPs, DPSPs and defined contribution RPPs. Limits apply to pension benefits provided under a defined benefit RPP:

- Annual contributions of 18% of earnings are permitted to be made to an RRSP and defined contribution RPP, up to a specified dollar limit (CAD 26 230 and CAD 26 500 respectively for 2018).
- Defined benefit RPPs are permitted to provide pension benefits of 2% of earnings per year of service, up to 1/9th of the DC RPP limit per year of service (CAD 2 944 for 2018).
- Annual contributions to a DPSP are limited to 18% of earnings up to one-half of the defined contribution RPP limit (CAD 13 250 for 2018).
- The RPP and RRSP dollar limits are indexed to average wage growth.

The RPP and RRSP limits are integrated in order to provide comparable retirement savings opportunities whether an individual saves in an RPP, an RRSP, a PRPP, a DPSP or a combination of these plans. This is achieved through the pension adjustment (PA), which reduces an RPP or DPSP member's annual RRSP limit by the amount of annual RPP and/or DPSP saving.

- For defined contribution RPP members and DPSP members, the PA is equal to the sum of employer and employee contributions.
- For defined benefit RPP members, the PA is an estimate of the contributions needed to fund the annual benefit accrued under the plan (based on a pension cost factor of 9 multiplied by the annual benefit accrued under the plan).
- PRPP contributions must be made within an individual's available RRSP limit.

Unused RRSP room is carried forward to future years.

In general terms, contributions to (or benefit accruals under) these plans must cease and payments/withdrawals must commence by or after the end of the year in which the plan member attains 71 years of age. In particular, an RRSP must be converted to a Registered Retirement Income Fund (RRIF) for this purpose. While defined benefit RPP members may not accrue pension benefits after the year in which they attain 71 years of age, employers may make any necessary contributions to a defined benefit RPP that are required to ensure the plan is fully funded in respect of all members and retirees, including those over age 71.

An individual who is 72 years of age or older, may, based on the individual's accumulated unused RRSP room, contribute to a spousal RRSP until the end of the year in which the spouse reaches 71 years of age.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Payments and withdrawals from pension and retirement savings plans are included in income for regular tax purposes and taxed at the applicable rate. Income tax is generally withheld on such payments and withdrawals.

Lump sum payments from an RPP, where they are permitted, generally are not treated differently than periodic pension payments for tax purposes (i.e., they are included in income and taxed at the applicable rate) except for the purposes of the Pension Income Credit and pension income splitting (lump sum amounts are not eligible). Where a lump sum amount is permitted to be transferred to another registered plan or used to purchase an annuity (e.g., where a member terminates their membership in, or retires under, an RPP), the transfer is tax-free (i.e. there are no immediate tax consequences). The transferred amounts would be included in income for tax purposes when withdrawn from the receiving registered plan or when received as annuity payments.

The Pension Income Credit (PIC) is a non-refundable tax credit provided on the first CAD 2 000 of eligible pension income. The credit rate is 15% federally.

A pension income splitting measure permits seniors and pensioners to allocate up to one-half of their eligible pension income to their spouse or common-law partner for tax purposes.

Eligible pension income for the Pension Income Credit and pension income splitting includes periodic pension payments from an RPP, regardless of the recipient's age, and other types of pension income (i.e., income from an RRSP annuity, RRIF, PRPP and DPSP annuity) as of age 65.

Generally, pension and RRSP assets may not be withdrawn tax-free, either in a lump-sum or on a periodic basis. However, tax-free withdrawals from an RRSP may be made by first-time home buyers for the purchase of a home or by those pursuing qualifying education or training programs, under the Home Buyers' Plan (HBP) and the Lifelong Learning Plan (LLP) respectively. Withdrawals are limited to CAD 25 000 under the HBP and CAD 20 000 under the LLP. HBP and LLP withdrawals must be repaid to an RRSP in regular repayments over a specified period, otherwise the repayment amount is included in income for tax purposes.

Non-tax incentives

No such incentives.

Social treatment

Social programme contributions (Canada Pension Plan contributions and Employment Insurance premiums) are not levied on employer contributions to an RPP, PRPP or DPSP, since employer contributions to these plans are excluded from an employee's earnings. Employee contributions to an RPP or PRPP attract social programme contributions since such contributions are made out of an employee's earnings. Contributions to an RRSP, which are generally made out of employment or self-employment earnings, attract social programme contributions.

Social programme contributions are not levied on pension income.

Tax treatment of pensioners

Public pension benefits (Canada Pension Plan and Old Age Security (OAS) benefits) are included in income for regular tax purposes and taxed at the applicable rate, with the exception of the Guaranteed Income Supplement (GIS), which is a non-taxable supplement to OAS provided to low-income seniors.

The Age Credit is a non-refundable tax credit provided to individuals age 65 and over on an amount of CAD 7 333 for 2018. The credit amount is reduced by 15% of income over a threshold of CAD 36 976 (for 2018) and is eliminated when income exceeds CAD 85 863 (for 2018). Both the credit amount and the income threshold are indexed to inflation annually.

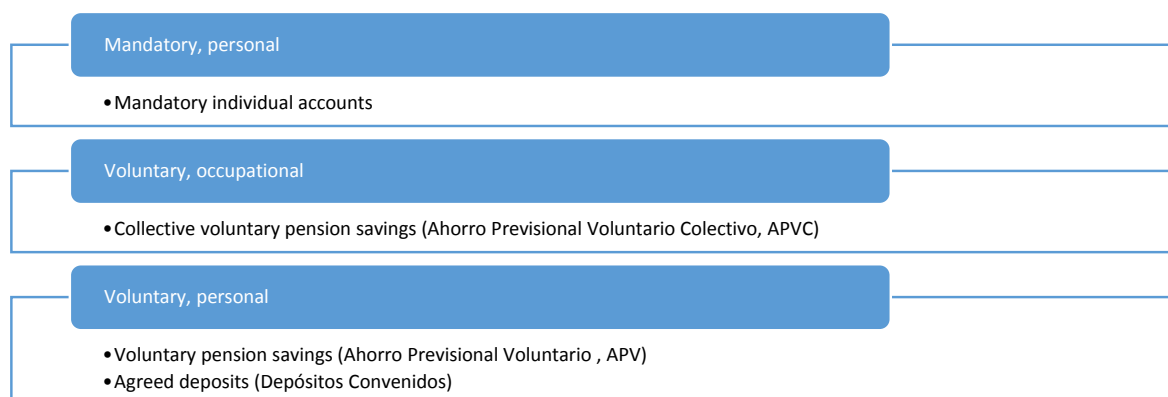
Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions to an RPP, a PRPP or a DPSP are deductible for the employer for income tax purposes.

Social programme contributions (Canada Pension Plan contributions and Employment Insurance premiums) are not levied on employer contributions to an RPP, PRPP or DPSP, since employer contributions to these plans are excluded from an employee's earnings.

Chile

Structure of the funded private pension system



Tax treatment of contributions

Members of the pension system contribute 10% of their salary to mandatory personal accounts. These contributions are tax-exempt. There is an upper limit for the salary taken into account for contributing to the system of 78.3 UF.⁸

Members may also contribute to voluntary accounts. These contributions are tax-exempt up to a certain limit. Regarding contributions to APV or APVC, there are two tax regimes available for members:

- Regime B: contributions are tax-exempt, up to a limit of 50 UF per month or 600 UF per year. Under this regime, voluntary contributions are deducted before taxation.
- Regime A: contributions are not deducted before taxation.

Agreed deposits are contributions settled between the employer and the worker. These savings may only be withdrawn upon retirement and they are not subject to taxation up to a maximum of 900 UF. Contributions above this limit are taxed at the individual's marginal rate of income tax.

Tax treatment of returns on investments

Returns on investments are not taxed in general.

Workers making voluntary contributions under regime A, withdrawing the funds and not using them to complement the mandatory pension, pay taxes upon withdrawal on the yield obtained from the amount withdrawn, at the individual's marginal rate of income tax.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income is subject to income tax.

Upon retirement, pensioners who can finance a pension greater than 100% of the maximum pension with solidarity payment and greater than 70% of the average monthly taxable wage over the last ten years, are entitled to withdraw the surplus as a lump-sum payment (i.e. funds remaining in the individual account after calculating the necessary savings to obtain the aforementioned pension). This available surplus is tax-exempt up to a maximum annual amount equivalent to 200 UTM, and the total exemption may not exceed 1 200 UTM.⁹ If members choose to withdraw the entire surplus in one year, the maximum exemption is 800 UTM. This exemption applies to all savings (mandatory and voluntary) done at least 48 months prior to retirement. In the case of agreed deposits, if an individual withdraws more than 900 UF but less than the limit of the surplus, the return on investment over the excess of 900 UF is taxed.

Workers may fully or partially withdraw the balance accumulated through voluntary contributions at any time, not only upon retirement. If the worker used regime B, these funds are subject to a special additional tax and are considered income for the year the withdrawals were made. The special additional tax is calculated differently depending on when the withdrawal is made:

- Withdrawal before meeting the conditions for retirement: The withdrawal is subject to one-off additional tax at the time of withdrawal at a rate between 3% and 7%. This rate is calculated as $0.03 + [1.1 \times (ICR - ISR)/R]$ where ICR corresponds to the amount of income tax that the individual would have to pay by adding the withdrawal to other taxable income for the fiscal year; ISR corresponds to the amount of income tax that the individual would have to pay if no withdrawals were made; R corresponds to the amount of the withdrawal.

- Withdrawal for pensioners or those who meet requirements for retirement: The withdrawal is subject to one-off additional tax at the time of withdrawal at a rate calculated as $(ICR - ISR)/R$.

If the worker used regime A, s/he does not have to pay the additional tax described above. In the case of withdrawal of funds before retiring, the worker loses the government matching contribution and pays tax on the return on investment. If voluntary contributions under regime A are used to complement the mandatory pension, the part of the pension financed with these voluntary savings is deducted before taxation.

Non-tax incentives

Workers between 18 and 35 years old with an income lower than 1.5 times the minimum wage are entitled to a government matching contribution for the first 24 contributions to the pension system. This contribution consists in two payments: a subsidy to employers for hiring this type of workers and a direct contribution to the worker's pension account of the same amount. The matching contribution is equivalent to 50% of the mandatory contribution of the worker if the wage is lower than or equal to the minimum wage; or 50% of the mandatory contribution over the minimum wage if the wage is greater than the minimum wage and lower than 1.5 times the minimum wage.

Women aged 65 or older are entitled to a government subsidy for each child alive at birth. The subsidy is equivalent to 18 months of contributions over the current minimum wage at the moment of the birth of the child, invested in fund type C since 2009 or since the birth of the child, whichever is later.

Workers making voluntary contributions under regime A (usually low-earnings workers whose wages are either exempted from income tax or have a low income tax rate) are entitled to a government matching contribution, corresponding to 15% of the amount saved annually, subject to a limit. These funds are added to the individual account each year but have a separate accounting. For each calendar year, the government matching contribution is limited to 6 UTM. If the member withdraws the funds instead of using them for retirement, the matching contribution is lost. It is not required to contribute to the mandatory system to get the matching contribution but only members of the pension system may contribute to voluntary accounts.

Social treatment

Social contributions (pension 10%; healthcare 7%; unemployment insurance 3% - of which 0.6% is paid by the employee and 2.4% by the employer - ; insurance for work-related accidents and occupational diseases 0.95%; disability and survivor insurance 1.41%) are levied over the gross salary. There is a maximum salary for social contributions of 78.3 UF. Pension contributions are part of the social security contributions.

Pensioners pay 7% of pension income for health coverage. Since 2011, pensioners eligible for a solidarity pension (who must belong to the 60% poorest population, among other requirements) are exempted to pay contributions for health insurance. Between 2012 and 2016, pensioners that belonged to the 80% poorest population and were not eligible for a solidarity pension, benefited from a reduction in the contribution for healthcare. Since November 2016, this latter group of pensioners is exempted to contribute for healthcare.

Tax treatment of pensioners

The basic solidarity pension and the pension supplement are taxed at the individual's marginal rate of income tax. In practice however, they are tax exempt, because the beneficiaries are in the lower part of the income scale.

Incentives for employers to set up or contribute to a funded private pension plan

Agreed deposits and contributions in APVC are considered as an expense for the employer and therefore reduce corporate income tax.

Czech Republic***Structure of the funded private pension system***

Voluntary, personal

- Supplementary pension insurance (participants funds)

Tax treatment of contributions

Individuals' contributions into supplementary pension insurance plans are paid from after-tax income. Contributions of and below CZK 1 000 a month are matched by government contributions. Contributions above CZK 12 000 a year are tax-deductible up to CZK 24 000 a year.

Employer contributions into supplementary pension insurance plans are not considered as taxable income for the employee up to CZK 50 000 a year. Above they are taxed as income

Tax treatment of returns on investments

Returns on investment are not subject to income tax during participation in the system but taxed according the rules described below in out payments from the system.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

If the participant would like to withdraw money and the conditions for lump sum or pension are not met, this closes the contract and any government contributions are returned to the government, and if the participant in such a case used tax incentives, the amount previously deducted must be taxed.¹⁰ In addition, the returns on investments and employers contributions are taxed at 15%.

Annuities are tax-free, including when withdrawn up to 5 years before the official retirement age. Programmed withdrawals for more than 10 years are tax-free. They are

otherwise taxed as income. Lump sums are taxed at 15% but the tax base consists only of the returns on investments and employer's contributions paid after January 2000.

Non-tax incentives

Individuals' contributions made into supplementary pension insurance plans are matched each month by the government according to the following scale:

- CZK 230 if the individual contributes at least CZK 1 000.
- CZK 210 if the individual contributes between CZK 900 and CZK 999.
- CZK 190 if the individual contributes between CZK 800 and CZK 899.
- CZK 170 if the individual contributes between CZK 700 and CZK 799.
- CZK 150 if the individual contributes between CZK 600 and CZK 699.
- CZK 130 if the individual contributes between CZK 500 and CZK 599.
- CZK 110 if the individual contributes between CZK 400 and CZK 499.
- CZK 90 if the individual contributes between CZK 300 and CZK 399.
- Nothing if the individual contributes less than CZK 300.

Employer contributions cannot be matched. The government contributions are not subject to income tax and social contributions.

Social treatment

Individuals' contributions above CZK 12 000 per year and up to CZK 24 000 are not included in income subject to social contributions.

Social contributions are not levied on employer's contributions up to the limit of CZK 50 000 per year.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Old-age public pay-as-you-go pensions are not taxed up to a value of 36 times the minimum wage.

Taxpayers can claim a tax credit of CZK 24 840 per year. Since 2014, the tax credit can also be claimed by individuals receiving an old-age public pension.

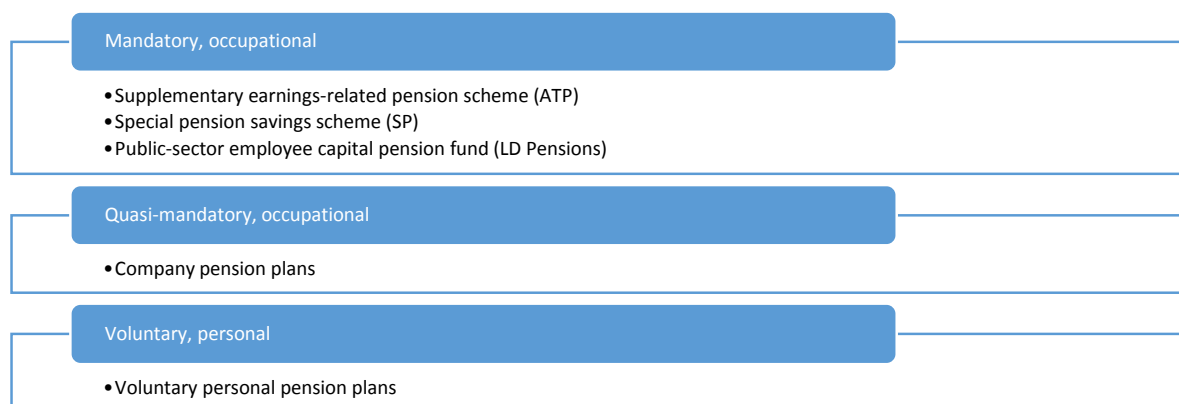
Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into supplementary pension insurance plans are deductible from corporate tax - more precisely they constitute expenses for tax purposes.

Social contributions are not levied on employer's contributions up to the limit of CZK 50 000 per year.

Denmark

Structure of the funded private pension system



Quasi-mandatory occupational plans and voluntary personal plans can run three different kinds of scheme: age savings (*Aldersopsparing*), programmed withdrawal (*Ratepension/Ophørende livrente*) or life annuity (*Livrente*).

Tax treatment of contributions

Employer contributions are not considered as taxable income to the employee.

In age savings, individual contributions are subject to labour market tax and income tax. There is a contribution limit of DKK 5 100 in 2018. The last five years before retirement age, the contribution limit is increased to DKK 46 000 per year.

For all the other plans, employee/individual contributions are deductible from income tax but still subject to the labour market tax (this tax is paid by the pension institutions):

- ATP: contributions are tax-exempt.
- Programmed withdrawal: contributions are tax-exempt up to DKK 54 700.
- Life annuity: contributions are tax-exempt.
- LD pensions: the scheme has not received contributions since 1980.
- SP: the scheme has not received contributions since 2010.

Tax treatment of returns on investments

Returns are subject to taxation, regardless of the form of the pension scheme. Returns are taxed yearly at a fixed rate of 15.3%. Returns include dividends, interests and changes in the market value of the assets.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

For ATP, programmed withdrawal and life annuity schemes, pension income is subject to personal income tax (but not to labour market tax).

Pension income from age savings schemes is tax-exempt and does not affect entitlements for the housing support and public pensions.

If an individual chooses to withdraw assets from programmed withdrawal or life annuity schemes before retirement age, the sum will be taxed at a fixed rate of 60%. Many occupational plans do not however offer this opportunity of early withdrawal.

Non-tax incentives

No such incentives.

Social treatment

No such contributions.

Tax treatment of pensioners

Public basic old-age pension is subject to personal income tax (but not to labour market tax).

Incentives for employers to set up or contribute to a funded private pension plan

Contributions made by employers are, like other parts of salaries, fully tax deductible as expenses.

Estonia

Structure of the funded private pension system



Tax treatment of contributions

In mandatory pension plans, only employee contributions and government matching contributions are possible. Employee contributions (2% of the gross salary withheld by the employer) are fully tax-deductible. Government matching contributions (4% of the gross salary) are not considered as taxable income to the employee. They are paid from the employer's social contributions (20% for pension insurance and 13% for health insurance).

Individuals receive a non-refundable tax credit on their contributions to voluntary pension plans corresponding to 20% of the contributions made during the year, up to 15% of gross income or EUR 6 000. The EUR 6 000 limit applies to the total employee and employer contributions. Contributions are otherwise taxed at the fixed income tax rate (20% in 2018). The tax credit only applies to contract opened for at least 5 years when the individual reaches 55.

Employer contributions to voluntary pension plans are considered as a part of the employee's salary and are not subject to personal income tax as long as they do not represent more than 15% of individual contributions, up to EUR 6 000. As the EUR 6 000 limit is common to employee and employer contributions, any employer contribution reduces the available room for individual contribution entitled to the tax credit.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension payments from the mandatory funded pension system and the pay-as-you-go public pension system are treated together in terms of taxation. An annual basic exemption is available to all Estonian residents who receive taxable income below EUR 25 200, and pension income exceeding the limit is taxed as income at the fixed income tax rate (20% in 2018).

The taxation of pension payments from voluntary pension plans depends on when the individual withdraws money and the form of pension payments.

- Early withdrawals (before age 55) are taxed at a rate of 20% except if the person has become fully and permanently disabled. For disabled people, lump sums are taxed at a rate of 10%, while life annuities are tax-free.
- Withdrawals from the age of 55 are taxed at a rate of 10% for fixed-term annuities and tax free for life annuities, provided that more than 5 years have passed since the conclusion of the contract. Withdrawals are taxed at a rate of 20% if less than 5 years have passed since the conclusion of the contract.
- All taxed withdrawals should be taken into account in yearly income when calculating the basic tax exemption.

Non-tax incentives

No such incentives.

Social treatment

Employees pay 1.6% of their earnings in contributions for unemployment insurance. The taxable base is the total amount of the gross wage or salary.

Social contributions are also paid by employers on the same taxable base than employees'. The social tax is 33% of gross salary. There is a minimum lump sum payment for each employee of EUR 155.10 (in 2018). In addition, employers pay the unemployment insurance premium at a rate of 0.8% of gross salary monthly.

Social contributions are not levied on pension income.

Tax treatment of pensioners

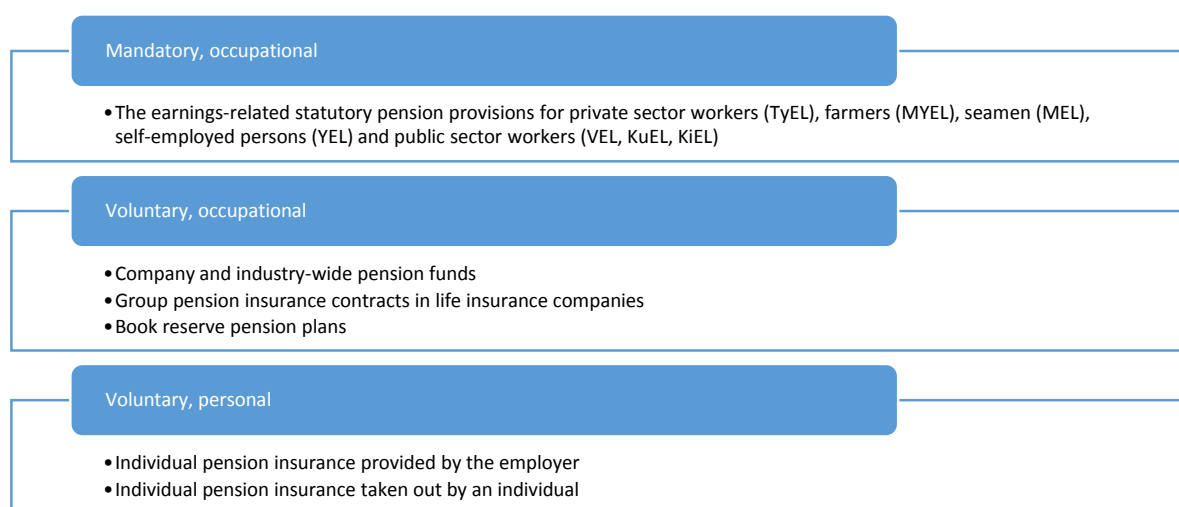
Pension payments from the mandatory funded pension system and the pay-as-you-go public pension system are treated together in terms of taxation. Pension income exceeding the annual basic exemption is taxed as income at the fixed income tax rate (20% in 2018).

Incentives for employers to set up or contribute to a funded private pension plan

Contributions to voluntary pension plans made by the employer are classified as expenses related to business. These expenses may be deducted from the employer's business income.

Finland

Structure of the funded private pension system



Tax treatment of contributions

Mandatory occupational plans: Employee contributions are fully tax-deductible from earned income. Employer contributions are not considered as taxable income to the employee.

Voluntary occupational group plans: Employee contributions are deductible from the employee's earned income up to the lesser of (i) 5% of salary or (ii) EUR 5 000 per year. If the employee contributes more than the employer does, the excess amount is not deductible. For voluntary occupational plans opened before 06/05/2004, employees' contributions are fully deductible. Employer contributions are not considered as taxable income to the employee.

If the employee contributes to the occupational group plan, the retirement age cannot be lower than the maximum statutory age (currently varying between 68, 69 and 70 years depending on the age of the insured person) to be eligible for tax relief.¹¹ If the employee does not contribute to the plan, in practice a minimum retirement age of 55 years has been applied.

Voluntary personal plans set up by the employer: Employee contributions are not tax-deductible for the employee. Employer contributions are not considered as taxable

income to the employee if they do not exceed a limit of EUR 8 500 per year. Excess contributions count as employee's salary and are taxed at his/her marginal income tax rate.

Voluntary personal plan taken by the employee: Individual contributions are deductible from capital income up to EUR 5 000 per year. If the capital income earned in the year is lower than the amount of deductible contributions, the difference is used to calculate a tax credit applicable to earned income tax. For example, if an individual contributes EUR 5 000 to a personal plan and has EUR 3 000 of capital income, the first EUR 3 000 of contributions are used to reduce capital income to zero. The tax credit is then calculated as 30% of the remaining EUR 2 000, i.e. EUR 600. Employer contributions are considered as taxable income to the employee. If the employer provides a voluntary personal plan for its employees, each year the employer contributes to it, the tax-deductible amount of contributions to a voluntary personal plan taken by the employee declines to EUR 2 500. If the voluntary personal plan was opened before 06/05/2004, contributions paid before 2006 were deductible from earned income.

For members of voluntary personal plans since 2013, the retirement age cannot be lower than the maximum statutory age (currently varying between 68, 69 and 70 years depending on the age of the insured person) to be eligible for tax relief. In addition, early withdrawal of pension assets is possible only under strict conditions (unemployment, disability, divorce and death of a spouse). Furthermore, the minimum withdrawal period has to be 10 years.

Tax treatment of returns on investments

Returns on investments in pension plans are not taxed during the saving time until pension is actually paid out.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension benefits received from mandatory occupational plans, voluntary occupational plans and voluntary personal plans provided by the employer are taxed as earned income, as part of the taxpayer's total earned income.

Pension benefits received from voluntary personal plans taken by employees are taxed as capital income. Capital income is taxed at a fixed rate of 30% up to EUR 30 000. The excess amount is taxed at 34%.

Non-tax incentives

No such incentives.

Social treatment

Employer health insurance contribution is payable by the employer on salary income, and if e.g. pension insurance contributions constitute taxable salary, the employer and employee health insurance contributions need to be collected. The average contribution in 2018 is 0.86% of salary paid. A so-called employee per diem contribution also needs to

be collected from income taxable as salary income, the rate of this contribution is 1.53% during 2018.

Similarly, if e.g. employer contributions to pension insurance are considered taxable salary income for the employee, mandatory unemployment and pension insurance contributions need to be collected.

The employer withholds the mandatory unemployment contribution from the employee's salary, and forwards both the employer's (in 2018, up to 2.6% of salary paid) and employee's (in 2018, 1.9% of salary received) contribution to the Unemployment Insurance Fund (TVR).

The average mandatory pension insurance contribution rate applicable for employer is 17.75% during 2018 on salaries paid. The mandatory pension insurance rate applicable for employees depends on the age of the employee and varies between 6.35% and 7.85%.

Pension income does not form a basis for pension or unemployment insurance contributions.

There is a separate health care contribution for pension income taxable as earned income. The health care contribution rate is 1.53% for pension income in 2018.

Tax treatment of pensioners

Public pension income is subject to taxes as earned income. However, pensions are entitled to a special pension deduction. The deduction ensures that persons who only receive a small, usually public, pension get their pension tax free.

Some public pensions and add-ons are always tax free, e.g. some war related pensions and state artist pensions.

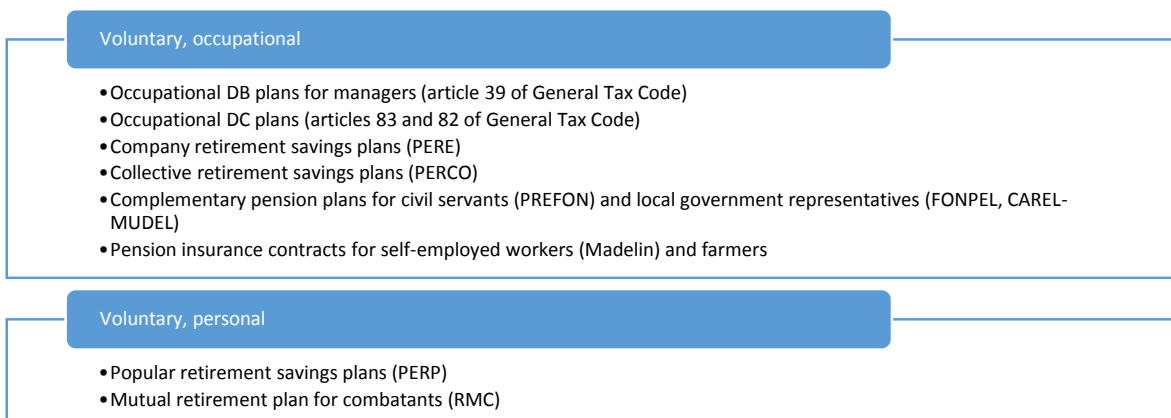
Incentives for employers to set up or contribute to a funded private pension plan

From the point of view of corporate income tax, the employer contributions to e.g. pension insurances can be deducted in the taxation of the employer, similarly to salary expenses. However, as such, there is no extra benefit in using these plans from the point of view of corporate income taxation.

As explained above, some employer (or employee) social contributions are not payable on e.g. voluntary pension insurances, if conditions are met.

France

Structure of the funded private pension system



Tax treatment of contributions

Personal income tax system

Employer contributions to all occupational pension plans (except article 82) are not considered as taxable income for the employee.

Employee contributions to occupational (except PERCO and article 82) and personal pension plans are tax deductible from income (or from taxable profit in case for Madelin contracts) up to specific limits. Contributions above the limits are taxed at the individual's marginal rate of income tax. The following limits apply:

- Article 39: No limit for the tax-exemption of employer contributions.
- Article 83 and PERE: Mandatory employer and employee contributions are tax-exempt up to a limit of 8% of the annual gross wage of the employee, with the annual gross wage capped at 8 times the annual social security ceiling. The contribution limit is reduced by tax-exempt employer or employee contributions into PERCO.
- Article 83, PERE, PERP and PREFON: The tax deduction limit for voluntary contributions is common for these four types of plan. The ceiling for a year is 10% of gross earnings of the previous year. This ceiling cannot be lower than 10% of the annual social security ceiling (EUR 3 973 in 2018) or greater than 8 times 10% of the annual social security ceiling (EUR 31 785 in 2018). This ceiling is reduced by the following contributions made in another retirement savings plan the same year:
 - Employer contributions and mandatory employee contributions into article 83 and PERE;
 - Employer contributions into PERCO;
 - Tax deductible contributions into Madelin contracts.
 - The final cap for one year is the ceiling of that year plus unused ceilings of the three previous years.
- Madelin contracts: The tax deduction limit for contributions depends on the taxable profit. If the taxable profit is lower than the annual social security ceiling

(EUR 39 732 in 2018) then the tax deduction is capped at 10% of the annual social security ceiling. If the taxable profit is between 1 and 8 times the annual social security ceiling, the cap is equal to 10% of the taxable profit plus 15% of the taxable profit above the annual social security ceiling. If the taxable profit is greater than 8 times the annual social security ceiling, the cap is equal to 10% of 8 times the annual social security ceiling plus 15% of 7 times the annual social security ceiling.

Employer contributions on behalf of employees into article 82 occupational plans are considered as taxable income for the employee and are not tax deductible.

Voluntary employee contributions into PERCO are not tax-deductible. However, profit-sharing contributions into PERCO are not considered as taxable income for the employee. Employer contribution into PERCO cannot exceed 16% of the annual social security ceiling and 3 times employee contributions (voluntary contributions and profit sharing contributions). Employee contributions into PERCO (voluntary contributions and profit sharing contributions) cannot exceed a quarter of the employee's gross earnings of the past year. The cap for employee contributions into PERCO includes any contributions made into company savings plan (PEE) or intercompany savings plan (PEI).

Social taxes

So-called "social" taxes are levied on employer and employee contributions to occupational pension plans (except article 39) and on individual contributions to personal pension plans: the General Social Contribution (CSG) at the rate of 9.2% and the Social Debt Reimbursement Contribution (CRDS) at the rate of 0.5%.¹² These social taxes are withheld from the salary. Part of the CSG is deductible from income tax (6.8%). Social taxes are not levied on contributions to article 39.

Tax treatment of returns on investments

For article 39, article 83, PERE and PERP, return on investment is exempt from income tax and social taxes.

Return on investment into PERCO and article 82 is not considered as taxable income during the accumulation phase. However, in case of a lump sum withdrawal, it is subject to social taxes at the rate of 17.2% (PERCO) or income and social taxes (article 82). Part of the CSG is deductible from income tax (6.8%).

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Annuities

Annuities paid by article 39, article 83, PERE, PREFON, Madelin and PERP are subject to the same social and income taxes as public pensions. These pensions are taxed at the individual's marginal rate of income tax after a 10% deduction. This deduction cannot be lower than EUR 383 per pensioner or greater than EUR 3 752 per household. If the individual's pension is lower than EUR 383, then the tax deduction is equal to the pension. These pensions are also subject to CSG (8.3%), CRDS (0.5%), health

contribution (1%) and the solidarity contribution for autonomy - CASA - (0.3%). Part of the CSG is deductible from income tax (5.9%).

An additional tax applies to annuities paid by article 39. The tax scale depends on the date when the annuities have begun:

- If the annuities have begun before 1 January 2011, the part of the monthly pension below EUR 500 is not taxed, the part between EUR 500 and EUR 1 000 is taxed at 7% and the part above EUR 1 000 is taxed at 14%.
- If the annuities have begun after 1 January 2011, the part of the monthly pension below EUR 400 is not taxed, the part between EUR 400 and EUR 600 is taxed at 7% and the part above EUR 600 is taxed at 14%.

The part of the additional tax covering the first EUR 1 000 of pension payment is tax-deductible.

Annuities paid by PERCO and article 82 are partially taxed at the individual's marginal income tax rate and subject to social taxes (17.2%), depending on the claiming age. If the individual claims the annuity before age 50, 70% of the pension is subject to income and social taxes. If s/he claims the annuity between age 50 and age 59, 50% of the pension is subject to income and social taxes. If s/he claims the annuity between age 60 and age 69, 40% of the pension is taxed. If s/he claims the annuity from age 70, 30% of the pension is taxed.

Lump sums and programmed withdrawals

Lump sums or programmed withdrawals are not allowed for article 39, article 83, PERE and PREFON. They are not allowed either for Madelin contracts, except if the pensioner buys his/her permanent residence.

In case of a lump sum withdrawal after 8 years from article 82, the payment is divided between a capital component and a return on capital component. Only the return on capital component above EUR 4 600 (for singles) is subject to taxes, as follows:

- if total premiums are lower than EUR 150 000, a single tax of 7.5% (or income tax at the individual's marginal tax rate), and social taxes;
- if total premiums are higher than EUR 150 000, a single tax of 30% (12.8% for income tax and 17.2% for social taxes) or income tax at the individual's marginal tax rate and social taxes.

Lump sums paid by PERCO are divided into a capital component and a return on capital component. Only the return on capital component is subject to 17.2% social tax. The lump sum is not considered as taxable income.

Pensioners can withdraw up to 20% of their PERP as a lump sum. In this case, pensioners can choose between three fiscal options:

- The lump sum is taxed at the individual's marginal rate of income tax after a deduction of 10%. The lump sum is also subject to CSG (8.3%) and CRDS (0.5%). CSG is partially tax deductible (5.9%).
- The income tax due for the lump sum is equal to 4 times the additional tax that would be generated by a quarter of the lump sum being taxed at the marginal rate of income tax. The lump sum is also subject to CSG (8.3%) and CRDS (0.5%). CSG is partially tax deductible (5.9%).

- The lump sum is entirely taxed at the rate of 7.5% and subject to CSG (8.3%) and CRDS (0.5%). In this option, there is not deductible CSG. This option is only available if it is not possible to withdraw another lump sum from the same contract in the future.

Non-tax incentives

No such incentives.

Social treatment

Contributions into article 39 plans are not subject to social contributions. More precisely, three types of employer contribution are possible and depend on employer's choice. If the article 39 management is not delegated to an insurance company, social contributions are taxed at 48% of the insurance premium. However, in case of delegated management, the rate is 24%. Employer may choose pensions as tax base with a rate of 32%.

Employee and employer contributions into article 83 and PERE are subject to employee social contributions. Employer contributions within limits are subject to a fixed social fee of 20% instead of usual employer social contributions. The contribution limit is the highest of 5% of the annual gross wage (with the annual gross wage capped at 5 times the annual social security ceiling) or 5% of the annual social security ceiling. The limit is reduced by employer contributions into PERCO. Any contributions above the limit are subject to usual employer social contributions.

Employer contributions into article 82 are subject to social contributions.

Employee contributions (except profit-sharing contributions) into PERCO are subject to social contributions. Employer contributions are subject to a fixed social fee of 20% instead of usual employer social contributions, lowered to 16% on two conditions.

Contributions to PERP and "Madelin" contracts are subject to social contributions.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Public pensions are taxed at the individual's marginal rate of income tax after a 10% tax deduction. This deduction is computed on public pensions and some private pensions (article 39, article 83, PERE, PREFON, Madelin contracts and PERP). It cannot be lower than EUR 383 per pensioner or greater than EUR 3 752 per household. If the individual's pension is lower than EUR 383, then the tax deduction is equal to the pension.

Pensioners with low "fiscal reference income" are partially or fully exempt from social taxes. The value of the income thresholds in Table A A.4 depends on the family composition and on whether the individual leaves in metropolitan France or in Overseas Departments of France.

Table A A.4. France: Exemption from social taxes

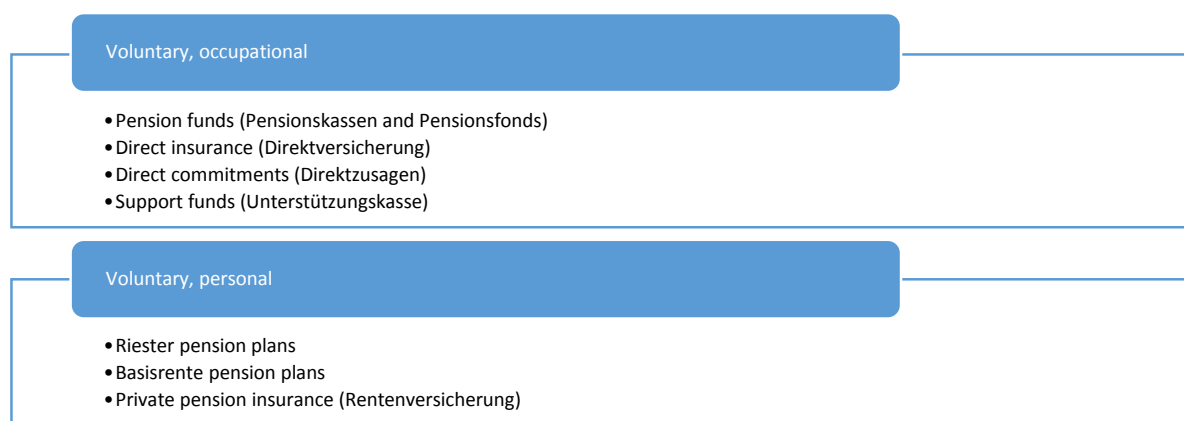
Fiscal reference income	CSG	CRDS	CASA
< Exemption threshold	Exempted	Exempted	Exempted
Between Exemption threshold and Partial CSG threshold	3.8% (3.8% tax deductible)	0.5%	Exempted
> Partial CSG threshold	8.3% (5.9% tax deductible)	0.5%	0.3%

Incentives for employers to set up or contribute to a funded private pension plan

Employers contributions to occupational private pension plans (article 39, article 83, PERE and PERCO) are deductible from corporate tax. Regarding social contributions, the social treatment described above is also an incentive for employers to set up or contribute to a funded private pension plan.

Germany

Structure of the funded private pension system



Since 1 January 2018, social partners can agree to introduce occupational defined contribution schemes per collective agreement. These plans can be offered by life insurers and pension funds.

Tax treatment of contributions

Pension funds and direct insurance: Employer and employee contributions are tax exempt, up to 8% of the social security contribution ceiling (EUR 78 000 per year in 2018). If total contributions exceed the limit, they are taxed at the individual's marginal rate of income tax. For members who joined the plan before 2005, in certain cases, total contributions up to EUR 1 752 could be subject to a 20% fixed tax rate (plus solidarity and church tax), provided this rate is more beneficial than the employee's personal income tax rate and that the 8% tax deduction rule would not be used.

Direct commitments: Employer and employee contributions are tax free and no ceiling applies.

Riester pensions: Riester pensions are available only to individuals who are actively compulsorily insured in a pension system, where the benefits were reduced by the

legislation in or after 2002 (i.e. employees, civil servants, unemployed in receipt of unemployment benefits, recipients of disability pensions). Riester pension plans and the corresponding incentives are also generally available to spouses and partners of civil partnership if both partners live in the European Union, are not separated from each other, make the minimum payment and conclude a Riester contract. Plan members can receive a government subsidy and pay contributions net of those subsidies. Their gross contributions (including the subsidy) can be deducted from income tax up to EUR 2 100. From a technical point of view, the government subsidy can be seen as an advance on the subsequent tax relief.¹³ To be incentivized, contributions must be paid to an officially certified Riester pension contract. Important certification criteria are the following. The pension has to be paid in the form of a life annuity and if the contract was signed after 2011, the payment must not occur before age 62.¹⁴ Alternatively, income drawdown until age 85 with a subsequent lifetime annuity from age 85 onwards is permitted.

Basisrente pensions: Contributions to Basisrente pensions are partly taxed at the individual's marginal income tax rate. From a tax perspective, Basisrente pension plans are treated like pillar one pensions (mandatory state pension plan and collective retirement schemes for selected professions). These pensions are in a transition period regarding taxation. Contributions to pillar one pensions (including Basisrente contributions) are partly taxed, the exempt part growing by 2 percentage points every year, starting from 60% in 2005. This means that in 2018, 86% of a maximum EUR 23 712 for single individuals (EUR 47 424 for married couples) of contributions can be deducted from taxable income. Contributions will be fully tax exempt from the year 2025, up to a maximum equal to the maximum contribution to the miners' statutory pension scheme (Knappschaft). The limit counts for the total contributions to mandatory state pension, collective retirement schemes for selected professions and Basisrente pensions. For contributions to Basisrente pensions to be tax-incentivized, they must be paid to an officially certified Basisrente contract. Important certification criteria are the following. The benefit payment of a Basisrente scheme must be under the form of a life annuity and if the contract was signed after 2011, the payment must not occur before age 62. The savings cannot be inherited by someone else, must be non-transferable, cannot be used as collateral, cannot be sold and cannot be subject to capitalization.

Private pension insurance: No tax relief on contributions.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

In general, pension income is taxed at the individual's marginal rate of income tax.

Direct commitments: Direct commitments are in transition period regarding the taxation of pension income. The tax-free allowance on benefits will be gradually phased-out from 40% of pension income up to EUR 3 000 in 2005 to 0% by the year 2040. If the payment of the benefits starts in 2018, 19.2% of pension income is tax-free, up to EUR 1 440.

Pension funds, direct insurance and Riester pensions: If the benefits of tax-deducted contributions are paid as annuities or a maximum of 30% as a lump sum, they are taxed at the individual's marginal rate of income tax. If the annuity is lower than EUR 28.35 per month then the whole benefits can be paid as a lump sum and are also taxed at the individual's marginal rate of income tax. Programmed withdrawals with subsequent annuitisation from age 85 from Riester plans are also taxed at the individual's marginal tax rate. If the benefits of non-tax-deducted contributions (e.g. contributions exceeding tax limits or paid without being entitled to Riester subsidy) are paid as annuities, then only an age-dependent percentage of the pension is liable for taxation (see description below for private pension insurance).

Basisrente pensions: Due to the transitional regime, the taxation of pension income depends on the date of retirement. If the payment of the benefits started in 2005 or earlier, 50% of the benefits are subject to taxation at the marginal income tax rate of the pensioner. The taxable portion increases annually by 2 percentage points until 2020. Between 2020 and 2040, the taxable portion increases annually by 1 percentage point until reaching 100%. Therefore, pensions withdrawn on or after 2040 will be fully taxed. The tax-exempt part of the pension is determined in the year after the retirement (based on the rate applicable in the year of retirement) and is kept constant in nominal terms for the remaining lifetime of the retiree. If the payment starts in 2018 the taxation rate of the pension is 76%. The annual amounts are taxed at the individual's marginal rate of income tax.

Private pension insurance: Because for these products, in general, contributions are not tax-favoured, some special tax rules regarding the benefits apply. Withdrawals before age 62 are not allowed for contracts signed from 2012.

- For life-time annuities, only the so-called "income part" (i.e. returns on investment) will be taxed at the individual's marginal rate of income tax. This income part is determined by the age at which the retiree receives the pension for the first time. For example, if the recipient receives his/her pension for the first time at age 65, the taxable income part is 18% of the annual pension. For age 60 (respectively age 67) it is 22% (respectively 17%). This amount will be taxed at the individual's marginal rate of income tax.
- The taxable income in case of a lump sum payment is calculated as follows. The income part is the insurance benefit in the event of survival minus the paid-in contributions. If the lump sum is paid after holding the contract at least 12 years and the recipient is 60 years or older (if the contract was signed from 2012, the payment must not occur before age 62) half of the income part will be taxed.

Non-tax incentives

Riester plans

Members of Riester pension plans can receive government subsidies. Members pay own contributions net of the subsidy. The subsidy is paid into their account by a state authority. Members have to claim the subsidy annually within two years after contributing to the plan. They may also authorize the provider to claim the government subsidy for them. For single individuals or each partner of a married or civil partnership couple where both qualify for the subsidy, the maximum subsidy is EUR 175 per year and per person. In order to receive the maximum subsidy, the sum of the tax-deducted member's contributions and the subsidies must be at least equal to 4% of his/her previous

year's annual income before taxes (up to a maximum of EUR 2 100). If below 4%, the state subsidies will be reduced pro-rata. Spouses and partners of civil partnership of individuals entitled to the subsidy are entitled to the government subsidy too if they contribute at least EUR 60 per year to their own contract.

An additional child subsidy can also be paid into the Riester account if one of the parents receives child allowances. The maximum subsidy amounts to EUR 185 per year and per child born before January 1st 2008; or EUR 300 per year and per child born on or after January 1st 2008. As a default the mother receives the subsidy, unless otherwise agreed.

Young individuals, who receive the government subsidy before their 25th birthday, receive an additional maximum one-time bonus of EUR 200.

Since 1 January 2018, income from a Riester pension is no longer included in the income assessment to determine eligibility for receiving social welfare payments ("basic social security").

Social partner model

For deferred income contracts signed as of 2019, employers have to forward 15% from the deferred income to the pension fund or direct insurance contract, if they save social insurance contributions due to the deferral of income. This contribution is tax free for the employee, within the general maximum amounts.

To support employees earning less than EUR 2 200 per month, the "Law to improve occupational retirement income provision" introduces new incentives for the setting up and expansion of occupational pension schemes. If employers contribute at least EUR 240 per year to an occupational pension scheme on behalf of a low-income earner, in addition to the regular wage payment, they get a tax allowance of 30% of the contribution, up to a maximum contribution of EUR 480 (i.e. the tax allowance varies between EUR 72 and EUR 144 per year). The additional employer contribution is tax free for low-income earners. In addition, occupational pension benefits of up to EUR 200 are not included in the income assessment to determine eligibility for receiving social welfare payments.

Social treatment

Pension funds and direct insurance: Neither the employee nor the employer has to pay social insurance contributions (state pension, unemployment, health and long-term care insurance) on the contributions within the 4% of the social security contribution ceiling limit. On the additional 4% of contributions which are still tax free, social insurance contributions are levied.

Direct commitments: Employer contributions are exempt from social insurance contributions without any limit. Same for employee contributions (deferred compensation) within the 4% of the social security contribution ceiling limit.

Pensioners have to pay the full contribution rate to health (14.6% in 2015) and long-term care insurance (2.55% in 2018) from their occupational pension payments. However, these expenses are deductible from taxable income up to certain limits. For individuals who have to finance their health insurance on their own and do not get tax-free benefits for this propose, the limit is EUR 2 800 per person and per year. For all the others, the limit is EUR 1 900 per person and per year. If the contributions to the basic health and basic long-term care insurance are higher than the limit, these higher contributions are

deductible. Contributions to health and long-term care insurance are considered as basic if they are paid to establish a care level which corresponds to the level reached when social welfare is granted.

State pensioners who contributed most of their lifetime to the public health insurance become entitled to pensioners' health insurance. In this case the state pension scheme pays half of the general contributions to health insurance (7.3% in 2018). Pensioners contribute half of the general contributions plus additional contributions stipulated by their particular health insurance. They pay the full rate of contributions to long-term care insurance (2.55% in 2018).

Riester pension, Basisrente pensions and private pension insurance: Contributions have to be paid from income from which social contributions were levied (including occupational Riester plans). Benefit payments are not subject to social insurance contributions if the retiree is eligible to pensioners' health insurance. Non-eligible pensioners have to pay the full health and long-term care insurance contributions.

Tax treatment of pensioners

Germany is currently in a transition period regarding the way income from the public pay-as-you-go system is taxed – by 2040 pensioners' income will be fully taxed. Before this date, pensioners benefit from an allowance which is not taxed. For the individual pensioner the allowance is calculated based on the pension received in the first year after the retirement (50% in 2005; annual increase of 2 percentage points until 2020 and 1 percentage point between 2020 and 2040 until reaching 100%) and is nominally fixed for the remaining lifetime. Simultaneously, contributions to the state pensions will benefit over time from growing tax relief.

There is an additional deduction of EUR 138 for pensions drawn at any age.

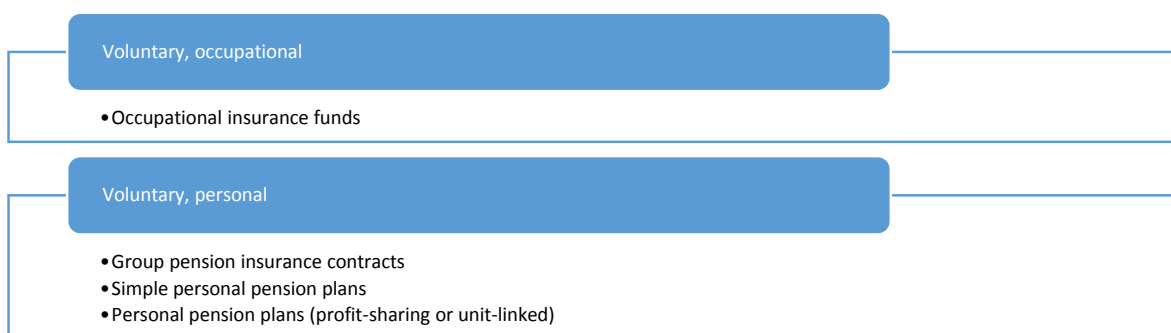
Incentives for employers to set up or contribute to a funded private pension plan

From the employer's perspective, payments to a direct insurance, a pension fund or a support fund can be deducted as operational expenses. In the case of direct commitments, an accrual should be recognized as liability. Pension accruals lead to a reduction of profit for tax purposes and in this way also to a lower tax burden. In most cases, this creates a tax deferral effect which acts in a long-term manner.

Under the new social partner model, if employers contribute at least EUR 240 per year to an occupational pension scheme on behalf of a low-income earner (earning less than EUR 2 200 monthly), in addition to the regular wage payment, they get a tax allowance of 30% of the contribution, up to a maximum contribution of EUR 480 (i.e. the tax allowance varies between EUR 72 and EUR 144 per year). The allowance is administered through the wage tax and reduces the employer's wage tax liability.

Greece

Structure of the funded private pension system



Tax treatment of contributions

Contributions paid to occupational insurance funds established by law, including employer's and employee's contributions, are not taxed.

Contributions paid by the employee or by the employer on behalf of the employee under group pension insurance contracts are not taxed.

Contributions to other personal pension plans are not deductible from income and therefore taxed.

Tax treatment of returns on investments

Returns on investment in private pension plans are tax exempt.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income from occupational insurance funds is taxed at the individual's marginal rate of income tax.

If the contributions to personal pension plans are taxed during accumulation phase then the private pension income is not taxed. If the contributions to personal pension plans are not taxed during accumulation phase then the private pension income is taxed.

Non-tax incentives

No such incentives.

Social treatment

Social insurance contributions are not levied on pension contributions.

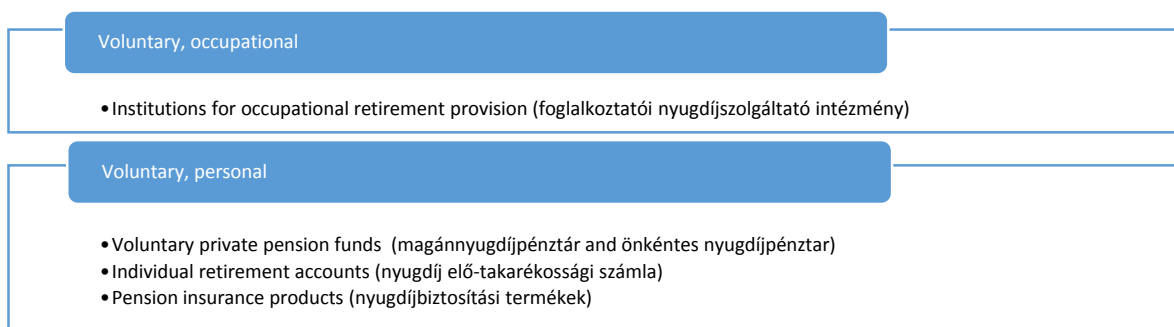
Social insurance contributions are not levied on pension income.

Tax treatment of pensioners

Public pension benefits are taxable at the individual's marginal rate of income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer's contributions are deductible from corporate income tax.

Hungary***Structure of the funded private pension system******Tax treatment of contributions***

Employees' contributions are paid from net wages. They are therefore taxed at the fixed income tax rate of 15%.

Employers may contribute as well. Employer's contributions are not considered taxable income for the employee but are subject to personal income tax at the rate of 17.7% ($1.18 \times 15\%$), paid by the employer.

Contributions to private pension plans enjoy tax relief in the form of a tax refund transferred and credited to the employee's pension account. The tax refund is equivalent to 20% of contributions made, up to a limit. The contributions could come from 3 sources: employee contribution, employer contribution and employer donation. The maximum amount of tax refund is HUF 100 000 per year in case of individual retirement accounts (for those who retire before 2020, the limit is HUF 130 000), HUF 150 000 per year in case of voluntary private pension funds and HUF 130 000 per year in case of pension insurance. If the individual has more than one of the above-mentioned savings plans, the amount of tax relief cannot exceed HUF 280 000 per year altogether. Individuals get tax relief on contributions as long as they contribute to voluntary private pension funds and/or individual retirement accounts. The tax refund paid to the member cannot be more than the personal income tax liability.

Tax treatment of returns on investments

Returns on investments in private pension funds are tax free provided the returns are not withdrawn from the account before the pension payments started.

In case of voluntary private pension funds, after 10 years of membership, returns can be withdrawn tax free once every 3 years. Otherwise returns withdrawn are taxed at a rate of 15% and health care contribution (19.5%) is also levied on returns on investment.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

After a certain waiting period, pension income from voluntary private pension funds is tax free:

- If the account was opened before 01/01/2013 and the membership period was less than 3 years, lump sum pension payment is taxed, while a programmed withdrawal of at least 3 years of duration is tax free upon the condition that the decrease of the yearly payments is less than 15%. Pension payments are tax free after 3 years of membership.
- If the account was opened after 01/01/2013, pension payments are tax free after 10 years of membership. Withdrawals before the retirement age are usually taxable at 15% personal income tax and 19.5% health care tax. However, in case of withdrawals from voluntary private pension funds after the 10-year compulsory period has elapsed, the taxable part of the income is reduced gradually (10% reduction per year), i.e. after 20 years of membership withdrawals become tax free.

In case of other types of private pension fund (e.g. individual retirement accounts), withdrawals before the retirement age are taxable for the individual at 15% personal income tax and 19.5% health care tax (the base of the tax and the contribution is 78%). In addition, when an individual wants to access to the individual retirement account before the retirement age, the 20% tax refund has to be paid back.

Non-tax incentives

The tax refund credited to the employee's pension account can also be seen as a government matching contribution of 20% of the contributions made to private pension funds, up to the limit previously described. The tax refund paid to the member cannot be more than the personal income tax liability.

Social treatment

Social contributions are levied on employee contributions.

Health care contribution is not payable by the employee, but the employer is responsible for the payment of it. Employer's contribution to institutions for occupational retirement provision and/or to voluntary private pension funds is subject to 23.01% ($1.18 \times 19.5\%$) healthcare contribution.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Public pension income is tax exempt.

Incentives for employers to set up or contribute to a funded private pension plan

Employers can deduct contributions to private pension plans as expenses.

The incentive for the employer to pay pension contributions is indirect. If the employer wants to give for instance HUF 100 employer contribution, it will cost HUF 140.01 (the employer pays 17.7% personal income tax and 23.01% health care contribution). If the employer wants to give HUF 100 net salary increase for the employee, the employer should give HUF 150.38 gross salary increase (the gross salary of the employee is subject to 15% personal income tax, 10% state pension contribution, 7% health care contribution and 1.5 % labour market contribution), which in total costs HUF 181.95 after taking into account the taxes and health care contributions paid by the employer.

Employers can also make contributions as donations. Employers can deduct donations as expenses.

In order to be eligible for tax relief, employers have to make a contract with the fund to make contributions. The employer's contribution has to be identical (same amount or same percentage) for each employee who is a fund member. Employees who have been in employment for at least six months cannot be excluded.

Iceland

Structure of the funded private pension system



Tax treatment of contributions

Both employer and employee contributions to occupational pension funds are tax-deductible. Employees can deduct up to 4% of their salaries as contributions. There is no limit for employer contributions.

If individuals decide to start personal pension savings, the minimum contribution is 2% of wages. This contribution is then matched by the employer with another 2% of wages. Individual contributions to personal pension funds are deductible from taxable income up to 4% of the salary. Excess contributions are taxed at the marginal income tax rate. The employer matching contribution is tax exempt.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income is taxed as ordinary wage income and subject to the individual's marginal income tax rate.

A law passed in June 2014 allows active members in voluntary personal pension plans to withdraw assets tax free to pay down residential housing debt, up to ISK 750 000 per year for couples taxed together and ISK 500 000 per year for single persons. Individuals who do not own their residential housing can withdraw up to ISK 500 000 per year and per person to invest in residential housing. This kind of tax-free withdrawal was initially supposed to end in 2019, but an additional article was passed in law in July 2016 to extend this possibility for 10 years from 2016.

Non-tax incentives

According to collective agreements, employers contribute minimum 2% of the salary to voluntary personal pension plans if the employee decides to start personal pension savings. The most common contribution rate (employee and employer) is 6% of the employee's salary as most employees contribute their maximum tax-free percentage (4%).

Social treatment

Social contributions are not levied on pension contributions.

Social contributions are not levied on pension income.

Tax treatment of pensioners

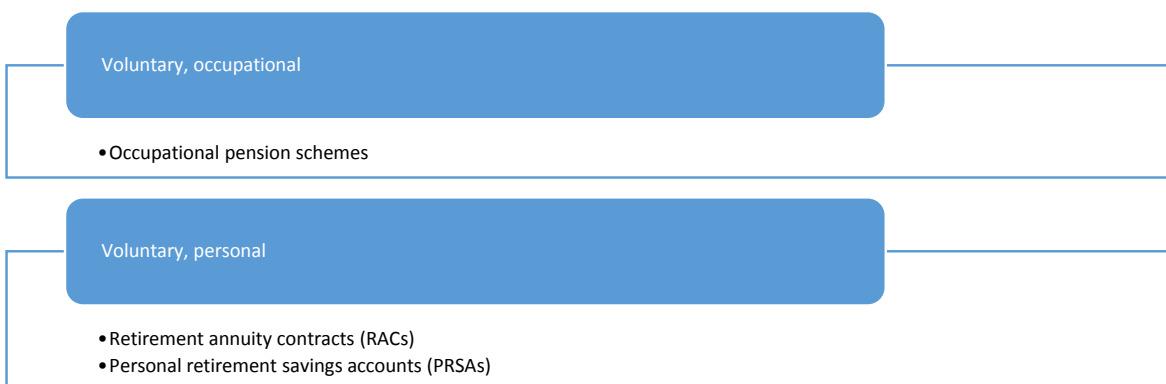
Public pension income is taxed as ordinary wage income.

Incentives for employers to set up or contribute to a funded private pension plan

There is no incentive for employers to set up or contribute to private pension savings plans. Contributions are mandatory and based on collective agreements. Pension plans are autonomous and not directly linked to the employer.

Ireland

Structure of the funded private pension system



Tax treatment of contributions

Contributions made by employees to any kind of pension plan are deductible for income tax purposes. The contributions to approved pension schemes or plans by employees subject to the pay-as-you-earn (PAYE) tax system are deducted from gross pay before the application of income tax under PAYE (this is known as the “net pay arrangement”). Self-employed individuals or individuals in non-pensionable employment must claim tax relief on contributions to pension saving arrangements. Low-income people who are exempt for filing income tax get no tax relief.

Employer contributions to occupational pension plans on behalf of their employees are not treated as taxable income in the hands of the employee.

Employer contributions on behalf of the employee to a PRSA or a RAC are treated as taxable benefit-in-kind for the employee. However, for the purposes of obtaining tax relief on pension contributions, the employee rather than the employer is deemed to have made such a contribution to the pension fund. The effect of this provision is that the tax relief on the contribution negates the taxable benefit-in-kind on the benefit provided. This treatment only applies where the employer contribution does not exceed certain limits based on the age of the employee. If combined employer and employee contributions exceed the limits, an unrelieved benefit-in-kind charge applies to the excess, at the employee’s marginal tax rate.

The amount of employee contributions that can be tax relieved is limited to an age-related percentage amount of the employee’s earnings (see Table A A.5). There is also an overall upper limit on the amount of earnings that are taken into account for the purposes of giving tax relief. Since 2011, this limit is set at EUR 115 000. These rules apply to aggregate employee contributions including additional voluntary contributions but do not apply to employer contributions into occupational pension plans.

Table A A.5. Ireland: Age-related percentage limits and corresponding contribution limits

Age	Percentage limit (% of earnings)	Contribution limit (EUR)
< 30	15%	17 250
30-39	20%	23 000
40-49	25%	28 750
50-54	30%	34 500
55-59	35%	40 250
= 60	40%	45 000

Tax treatment of returns on investments

Returns on investments are not taxed (i.e. exempt from capital gains and dividend income tax).

Tax treatment of funds accumulated

There is a lifetime limit on the total capital value of pension benefits that an individual can draw in his/her lifetime from tax relieved pension products. This limit is called the standard fund threshold (SFT) and is EUR 2 million since 1 January 2014. In certain circumstances, a higher threshold called the personal fund threshold (PFT) may apply.

On each occasion that an individual becomes entitled to receive a benefit under a pension arrangement, that individual uses up part of his/her SFT or PFT. Where the capital value

of the aggregate of such benefits exceeds the SFT or PFT, a “chargeable excess” arises equal to the amount by which the threshold is exceeded which is subject to an upfront income tax charge at the higher rate of income tax (currently 40%).

Individuals with pension rights whose capital value as at 1 January 2014 exceeds EUR 2 million are able to protect higher capital value by claiming a PFT from the Revenue Commissioners. The maximum PFT is EUR 2.3 million (i.e. the previous SFT limit), except where an individual holds a PFT issued on the previous occasions when the SFT was first introduced or reduced.

For DC pension arrangements, the capital value of pension rights when they are drawn down after 1 January 2014 is the value of the assets in the arrangement that represent the member’s accumulated rights on that date.

In the case of DB pension arrangements, the capital value of pension rights drawn down after 1 January 2014 is determined by multiplying the gross annual pension that would be payable to the individual (before commutation of part of the pension for a lump sum) by the appropriate valuation factor. DB pension benefits accrued to 1 January 2014 are valued using a standard valuation factor of 20 that applied up to that date. DB pension benefits accrued after 1 January 2014 are valued at the date of drawdown of those benefits by reference to a set of age-related valuation factors. The factors range from 37 for DB pension entitlements drawn down at age 50 and under, 30 where they are drawn down at age 60, to 26 at age 65 and 22 at age 70 or over.

Tax treatment of pension income

Pension income benefits are taxable as income at the individual’s marginal rate of income tax. Individuals can take tax-free lump sums as described below.

Individuals with DC pension savings can transfer some or all of their retirement savings upon retirement to an approved retirement fund (ARF), subject to conditions. Any money withdrawn from an ARF is taxed at the individual’s marginal rate. There is an imputed or notional distribution of the value of the assets of an ARF on 31 December each year unless the imputed distribution is matched by actual distributions and the notional amount is taxed at the ARF’s owner marginal income tax rate. The imputed percentage of ARF assets is 4% for ARF owners younger than 70 and where the value of ARF assets is EUR 2 million or less. The percentage is 5% for ARFs of such value where the owner is aged 70 or over. The level of the imputed distribution is 6% for ARFs with asset values in excess of EUR 2 million. The notional distribution measure was introduced to encourage drawdowns from ARFs so that they are used, as intended, to fund a stream of income in retirement.

Since 1 January 2011, the maximum sum that can be taken from a pension scheme at retirement tax free is capped at EUR 200 000. This tax-free amount is a lifetime limit and encompasses all retirement lump sums paid to an individual on or after 7 December 2005. Lump sum payments above that limit are taxed at the following rates:

Table A A.6. Ireland: Tax rates on lump sum payments

Lump sum payment	Income tax rate
≤ EUR 200 000	0%
EUR 200 001 to EUR 500 000	20%
> EUR 500 000	Taxpayer's marginal rate and USC

Non-tax incentives

No such incentives.

Social treatment

Employees' pension contributions do not receive relief from Pay-Related Social Insurance (PRSI) and Universal Social Charge (USC).

Employer contributions attract full PRSI relief. Employer contributions are not liable to the USC (except when the employer makes a contribution on behalf of the employee to a PRSA or to a RAC).

Pension benefits are subject to the USC.

Tax treatment of pensioners

All income in Ireland is generally subject to taxation. Social welfare payments may or may not be deemed taxable but even if an individual's social welfare payment is taxable (as state pensions are), s/he may not actually have to pay tax on it. Individuals getting a social welfare payment get a PAYE tax credit in addition to their normal tax credits. This means, if a social welfare payment is the only source of income, the individual may not pay tax because his/her tax liability does not exceed his/her tax credits. If an individual has a social welfare payment and another source of income, both sources are added together and the individual is taxed on the total amount.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions to occupational pension plans on behalf of their employees are deductible in computing the income for tax purposes of the employer's business.

Employer contributions attract full PRSI relief. Employer contributions are not liable to the USC (except when the employer makes a contribution on behalf of the employee to a PRSA or to a RAC).

Israel

Structure of the funded private pension system



Tax treatment of contributions

Employer contributions are not included in the taxable income of the individual up to 7.5% of the individual's salary, with a cap on gross salary of 2.5 times the national average salary for employees and 16.5% of the national average salary for self-employed people. Excess contributions are taxed at the individual's marginal rate of income tax.

Employee contributions are subject to a cap at 20.5% of twice the national average salary. Employee contributions are subject to a 35% non-refundable tax credit up to 7% of the salary that is taken into account for pension savings (sometimes not all the components of the salary are taken into account for pensions).

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Annuities below a limit called "entitled annuity" are tax exempt. The tax rate for the part of the annuity above the entitled annuity is 35%. The entitled annuity amount depends on the extent to which the right to an exemption on severance pay was used. In 2018, the full exemption was NIS 8 380 monthly.

Since 2008, the capital accumulated in any of the pension products (pension funds, provident funds and life insurance policies) has to be converted into an annuity, up to a minimum of NIS 4 418 (based on minimum indexed wage as of 2008). If the capital accumulated translates into a larger annuity, the individual can ask for the minimum annuity and take the difference as a lump sum. Lump sums below NIS 739 116 are tax free and anything in excess is taxed at 35%.

Non-tax incentives

No such incentives.

Social treatment

Social contributions are not levied on pension contributions.

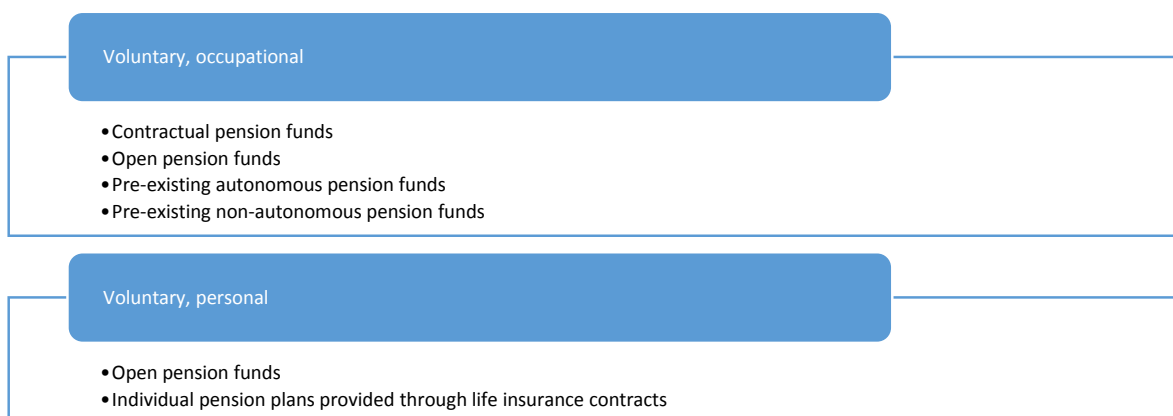
Old age pensions are subject to social insurance contributions. These contributions are deducted at source.

Tax treatment of pensioners

Public pension income is subject to income tax.

Incentives for employers to set up or contribute to a funded private pension plan

No such incentives.

Italy*Structure of the funded private pension system**Tax treatment of contributions*

Contributions are exempt from personal income tax up to EUR 5 164.57 per year. This limit applies to the sum of employee and employer contributions. Contributions above the limit are taxed at the individual's marginal rate of personal income tax.

TFR (*Trattamento di fine rapporto*) flows paid into a pension scheme are excluded from the contributions subject to such limit and thus are exempt from personal income tax, regardless of their amount.

Employees who got their first job since 1 January 2007 are entitled to recoup the unused annual tax relief of their first five years of participation in a pension scheme, up to the limit of 50% of the maximum annual relief. The recoupment may take place in the 20 years following the first five years of participation.

Since 2017, performance bonuses granted to employees up to EUR 3 000 per year are exempted from personal income tax if they are used for a number of welfare-related expenses, including contributions into occupational pension plans. However, since most

of these welfare-related expenses do not qualify for any dedicated tax relief, and most pension plan members contribute well below the pension-specific limit of EUR 5 164.57 per year, it is expected that the tax relief of performance bonuses will rarely be used for pension contributions.

Tax treatment of returns on investments

The total investment return of pension funds (interest, dividends, capital gains) is taxed at a 20% standard rate, except for the total return of government bonds, taxed at the more favourable rate of 12.5% (for example, if the investment return comes 50% from shares and 50% from government bonds, the tax rate applied will be 16.3%). This rule applies since 2014. The tax is levied annually, on the total investment income earned.

Since 2017, returns of new investments of pension funds in stocks of Italian and/or European companies are tax free, if they are kept for at least five years.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension benefits are taxed at a fixed rate of 15%, with a reduction of 0.3% for every year of participation after 15 years. The maximum reduction is 6% (leading to a 9% tax rate after 35 years of participation). Taxation is applied on the pension benefit net of the part that was already taxed in the accumulation phase (either as contributions exceeding the tax-deductible limit, or as investment income). Therefore, although the Italian system is often described as “ETT”, actually every euro paid into pension funds is taxed “one time only” (i.e. no “double” taxation occurs).

Early withdrawals (for buying a house or other reasons) are generally taxed at a rate of 23%, regardless of the type of contributions.

Non-tax incentives

In occupational plans, collective agreements between employee and employer associations provide for employer matching contributions, under the condition that the employee contributes as well.

Social treatment

Employee contributions are subject to the standard social contribution rate of 9.19% on earnings up to EUR 46 630. An additional 1% is levied for income above EUR 46 630 and up to EUR 101 427. For earnings exceeding EUR 101 427, the employee pays a fixed amount given by $(0.0919 \times 46\,630) + 0.1019 \times (101\,427 - 46\,630)$. These ceilings are updated annually.

Employer contributions are subject to a lower rate of 10% (instead of the standard contribution rate, around 24%), on earnings up to EUR 101 427; for earnings exceeding EUR 101 427, the standard contribution rate applies. Social contributions are not levied on TFR contributions.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Public pensions are taxed as personal income at the individual's marginal income tax rate.

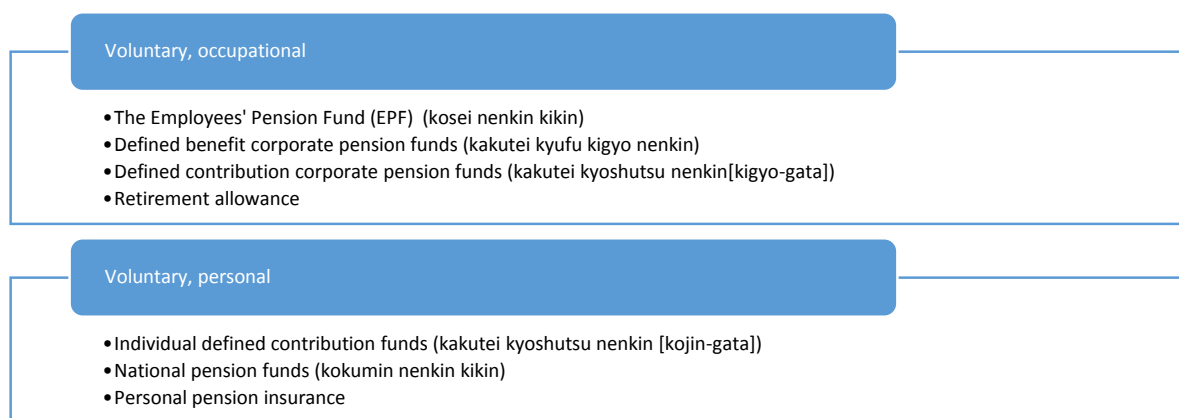
Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions are always considered as costs for the employer and hence they are deducted from business income in calculating the corporate tax.

Employer contributions to supplementary pension funds are subject to a social security contribution of 10% (lower than the standard contribution rate of about 24%), on earnings up to EUR 101 427; for earnings exceeding EUR 101 427, the standard contribution rate applies.

Japan

Structure of the funded private pension system



Tax treatment of contributions

Employee contributions

Contributions to DB corporate pension funds are deductible up to a yearly limit of JPY 40 000.

Contributions to defined contribution pension funds and EPFs are fully deductible without any limit. Employee contributions to DC corporate plans were prohibited until 2012. Since then, employee contributions cannot exceed employer contributions (employers are responsible for ensuring that contributions do not exceed the limit). The limit on combined employer and employee contributions has not changed (see below under employer contributions).

Employees are also eligible to participate in individual type DC plans. Contributions are tax deductible and the monthly contribution limit depends on the employer's plan sponsorship:

- Employers do not sponsor a DB or a DC plan: JPY 23 000
- Employers do sponsor only a DC plan: JPY 20 000
- Employers do sponsor at least a DB plan: JPY 12 000

Excess contributions are not allowed. For self-employed workers, the monthly contribution limit is JPY 68 000, although this is a combined contribution limit for DC and National Pension Funds.

Employer contributions

Employer contributions to all plans are not considered as taxable income (fringe benefit) for the members/employees.

Certain restrictions apply in the case of DC corporate plans. If the employer sponsors only one occupational plan, the maximum tax-deductible yearly contribution is JPY 660 000 for each employee. If the employer also sponsors a DB plan, the maximum tax-deductible yearly contribution to the DC plan is JPY 330 000 for each employee instead of JPY 660 000. Excess contributions are not allowed.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds.

Assets in EPFs, DB and DC plans are taxed at an annual rate of 1.173%. This tax has been temporarily stopped since 1999.

Tax treatment of pension income

Retirement income from occupational and personal pension plans is taxed separately without aggregation with other classes of income.

There is a pension-related deduction for annuities which commonly applies to public and private pensions, i.e. the tax treatment of public and private pensions is the same. Once the deduction has been calculated, the remaining income is taxed as general earned income (tax rates between 5% and 45%).

- For annual pension income (public and private) “A” below JPY 4 100 000, the statutory deduction is calculated as $(A - 500\,000) \times 25\% + 500\,000$;
- For A between JPY 4 100 000 and JPY 7 700 000, the statutory deduction is calculated as $(A - 4\,100\,000) \times 15\% + 1\,400\,000$;
- For A above JPY 7 700 000, the statutory deduction is calculated as $(A - 7\,700\,000) \times 5\% + 1\,940\,000$;

The statutory deduction cannot be lower than JPY 700 000 below age 65 and JPY 1 200 000 at age 65 and older.

Programmed withdrawals are not specifically stipulated in the Japanese pension legislation, but are not prohibited. They are usually classified as a kind of private pension income.

Lump sums are taxed at the individual’s marginal income tax rate.

Non-tax incentives

No such incentives.

Social treatment

Social contributions are not levied on pension contributions.

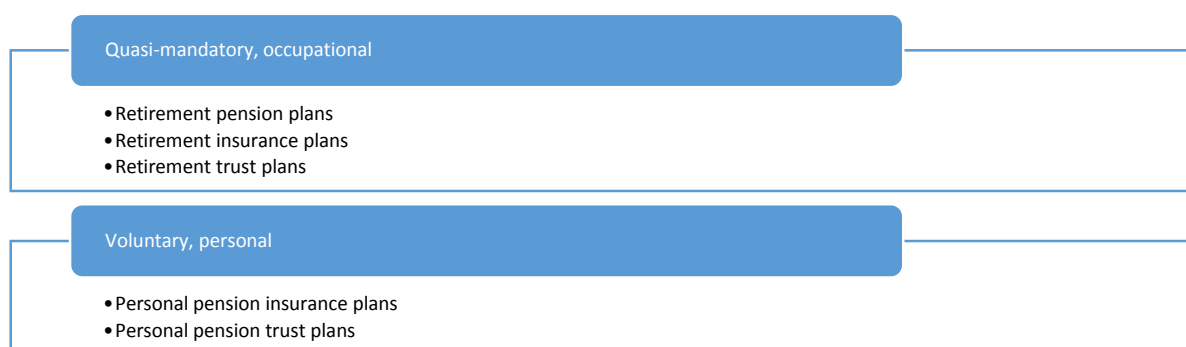
Contributions to health insurance and long-term care insurance are levied on pension income.

Tax treatment of pensioners

Old-age public pensions are taxed together with private pension annuities (see above).

Incentives for employers to set up or contribute to a funded private pension plan

No such incentives.

Korea***Structure of the funded private pension system******Tax treatment of contributions***

Individual contributions to personal pension plans and to occupational defined contribution pension plans are taxed at the individual's marginal tax rate but benefit from a tax credit. The tax credit is equal to 13.2% of the individual's contributions, except for individuals with an income lower than KRW 40 000 000 (or KRW 55 000 000 when the only income source is salary income) for whom the tax credit rate is 16.5%.¹⁵ There is a limit to the amount of contributions taken into account to calculate the tax credit which varies between KRW 4 000 000 and KRW 7 000 000 depending on the type of plan in which the individual contributes (see Table A A.7). Individual contributions to occupational DC pension plans and personal pension plans cannot exceed KRW 18 000 000 a year and are not possible in occupational defined benefit pension plans.

Table A A.7. Korea: Determination of the maximum contribution taken into account for the calculation of the tax credit for different illustrative cases

	Contributions into personal pension plans (KRW)	Contributions into occupational pension plans (KRW)	Maximum contribution for the calculation of the tax credit (KRW)
Case 1	0	7 000 000	7 000 000
Case 2	1 000 000	6 000 000	7 000 000
Case 3	2 000 000	5 000 000	7 000 000
Case 4	3 000 000	4 000 000	7 000 000
Case 5	4 000 000	3 000 000	7 000 000
Case 6	5 000 000	2 000 000	6 000 000
Case 7	6 000 000	1 000 000	5 000 000
Case 8	7 000 000	0	4 000 000

Employer contributions to occupational pension plans are not considered as taxable income for the employee. The minimum rate for employer contributions in defined contribution plans is 1/12 of total annual salary.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income¹⁶

Programmed withdrawals are not allowed. Individuals can withdraw both annuities and lump sums from their occupational DC plan from the age of 55. Individuals can claim annuities from their occupational DB plan if they are at least 55 years old and if they have completed at least 10 years of contributions. If the individual cannot withdraw annuities from his/her occupational DB plan, he/she can withdraw a lump sum.

The taxation of pension income depends on the source of the income and whether the individual chooses a lump sum or an annuity.

Pension income originating from employer contributions

To calculate the tax due on pension income originating from employer contributions, one first needs to calculate the tax base. The tax base is calculated according to the following formula:

$$\text{Tax base} = (\text{pension income} - \text{deduction for continuous years of service}) \times 12 \div \text{number of service years}.$$

The deduction for continuous years of service is provided in Table A A.8.

Table A A.8. Korea: Tax deduction for continuous years of service

Service years (SY)	Basic deduction	Additional deduction
Less than 5 years	KRW 300 000 x SY	None
5 to 10 years	KRW 1 500 000	KRW 500 000 x (SY minus 5 years)
10 to 20 years	KRW 4 000 000	KRW 800 000 x (SY minus 10 years)
More than 20 years	KRW 12 000 000	KRW 1 200 000 x (SY minus 20 years)

The total tax paid in the case of a lump sum is then determined by the following formula:

Tax paid =

(tax base – deduction for income level) × progressive income tax rates × number of service years ÷ 12

The deduction for income level, based on the tax base, is provided in Table A A.9.

Table A A.9. Korea: Tax deduction for income level

Tax base per annum	Deduction
Less than KRW 8 million	100%
KRW 8 million to 70 million	KRW 8 million +(60% exceeding KRW 8 million)
KRW 70 million to 100 million	KRW 45.2 million +(55% exceeding KRW 70 million)
KRW 100 million to 300 million	KRW 61.7 million +(45% exceeding KRW 100 million)
Over KRW 300 million	KRW 151.7 million +(35% exceeding KRW 300 million)

The difference between the tax base and the deduction for income level is taxed according to the progressive personal income tax rates (between 6% and 38%).

The tax rules incentivise annuities over lump sums, as only 70% of the previously calculated amount is due in taxes if the individual takes an annuity.

Pension income originating from employee/individual contributions and investment returns

If the individual takes a lump sum, the tax treatment depends on whether the contributions enjoyed the tax credit or not. If contributions did not exceed the maximum set for the calculation of the tax credit (Table A A.7), the lump sum is taxed at the rate of 16.5% (including local income tax). By contrast, contributions made in excess of the tax credit limit are withdrawn tax free.

If the individual takes an annuity, the tax treatment depends on the level of total retirement income (including public pensions). If total retirement income is below KRW 12 million, the individual can choose the separate taxation of the annuity. For a fixed-term annuity, the tax rate varies with the age of the annuitant (5.5% below age 70, 4.4% between 70 and 80, and 3.3% above 80). For a lifetime annuity, there is a fixed tax rate of 4.4% (including local income tax).

If total retirement income is above KRW 12 million, aggregate taxation of all sources of retirement income applies, according to the progressive personal income tax rates.

Non-tax incentives

No such incentives.

Social treatment

Contributions to private pension plans are not included in the social insurance contribution basis.

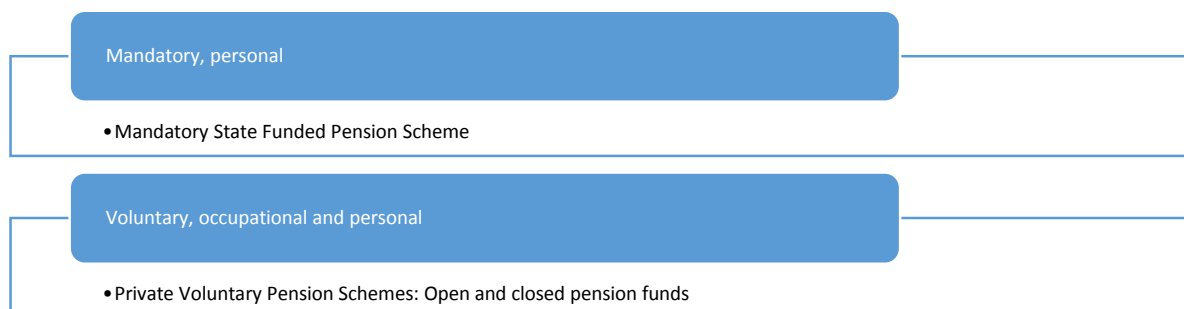
Social insurance premiums are not levied on private pension income, except for self-employed workers for whom social insurance premiums are levied on the basis of their comprehensive income.

Tax treatment of pensioners

Pension income from public pension schemes is taxed at the marginal rate of income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into occupational pension plans are tax deductible from corporate tax. Moreover, Charges for the Wage Claim Guarantee Fund are reduced by up to 50% if employers set up corporate pension plans rather than severance payment schemes.¹⁷

Latvia***Structure of the funded private pension system******Tax treatment of contributions***

Contributions to the Mandatory State Funded Pension Scheme (6% as of 2016) are fully tax exempt.

Voluntary contributions to open and closed pension funds are tax deductible up to 10% of the individual's annual taxable income. In addition, the joint limit for contributions to voluntary pension funds and insurance premiums may not exceed 10% of the individual's annual taxable income, up to EUR 4 000. Employer contributions are counted as income to the employee and are therefore deductible within the limit mentioned above. Excess contributions are subject to the individual's marginal income tax rate.

Tax treatment of returns on investments

Returns on investments are not taxed for the Mandatory State Funded Pension Scheme.

Income from investment in open and closed pension funds is considered as income from capital other than capital gains and taxed at a flat rate of 10%.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income from the Mandatory State Funded Pension Scheme is treated as ordinary income and taxed at the individual's marginal income tax rate.

Pension income formed from contributions made by an individual into private pension funds is not taxable. Pension income formed from contributions made by an employer (on behalf of an employee) into private pension funds is taxed at the individual's marginal income tax rate.

Non-tax incentives

No such incentives.

Social treatment

State Social Insurance Mandatory Contributions are tax-deductible expenses for personal income tax purposes.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Old-age pension above the annual non-taxable minimum is taxed at the individual's marginal income tax rate.

Incentives for employers to set up or contribute to a funded private pension plan

If an employer sets up or contributes to a funded private pension plan, these contributions are not subject to income tax and social insurance contributions, as long as the total does not exceed 10% of the gross remuneration calculated for the employee in the taxation year.

Lithuania***Structure of the funded private pension system***

Voluntary, personal

- Second pillar open pension funds
- Third pillar open pension funds

Second and third pillar pension plans are voluntary. However, once the decision to join the second pillar has been made, it is irreversible.

Tax treatment of contributions

Pension contributions to second pillar pension funds are a portion of the state social pension insurance contributions paid by employees and employers (2% in 2018; increasing to 3.5% from 2020). Social pension insurance contributions are not deducted from taxable income, thus are taxable at the fixed income tax rate of 15%.¹⁸ If the individual contributes voluntarily an additional 2% of income (not tax deductible), the government contributes an additional 2% of the average salary in Lithuania of the year before the last (tax exempt). For new participants who entered the second pillar after 1 January 2013, the additional individual and government contributions are mandatory.

Employee contributions to third pillar pension funds are considered as expenses and can be deducted within the annual deduction room for expenses. The total amount of deducted expenses (pension contributions, life insurance premiums, educational expenses) shall not exceed 25% of the taxable income, up to EUR 2 000 per year (this ceiling relates jointly to voluntary personal pension contributions and life insurance premiums). Excess contributions are subject to a fixed income tax rate of 15%. Employer contributions are not considered as taxable income to the employee if the amount of contributions does not exceed 25% of the employee's income related to employment.

Tax treatment of returns on investments

Returns on investments are tax exempt.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income from second pillar pension funds is tax-exempt.

The tax treatment of pension income from third pillar pension funds depends on the withdrawal age, the length of the contract and whether the individual has deducted third pillar contributions. For contracts opened since 1 January 2003, the following rules apply:

- If the contract duration is at least five years and the individual withdraws no more than five years before the statutory age of retirement, pension benefits are tax free.
- Otherwise, pension benefits are taxed at the fixed income tax rate of 15%, excluding the part of contributions that have not been deducted from taxable income.

Non-tax incentives

Government subsidies are available in the second pillar since 2014. Since 2016, the government contributes an additional 2% of the average gross salary in Lithuania of the year before the last if the individual agrees to contribute an additional 2% of his/her gross salary. This arrangement is mandatory for new participants who entered the second pillar after 1 January 2013.

Since 2014, the government contributes 2% of the average gross salary in Lithuania in the second pillar pension plan for parents who are in parental leave for every child under three years old.

Social treatment

Social contributions are levied on private pension contributions.

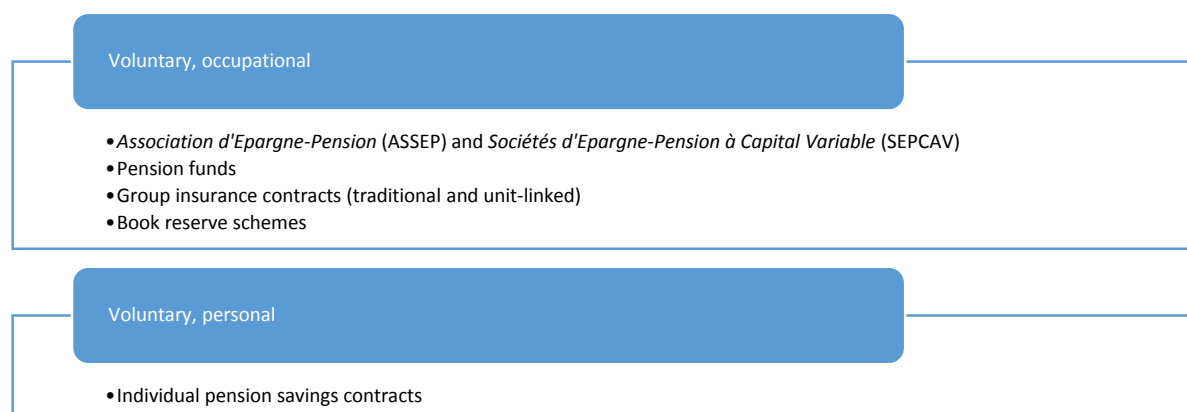
Social contributions are not levied on pension income.

Tax treatment of pensioners

Payments from the public pension scheme (SoDra) are tax exempt.

Incentives for employers to set up or contribute to a funded private pension plan

For the purpose of calculating corporate income tax, all contributions to pension funds made by the employer are considered as tax deductible.

Luxembourg***Structure of the funded private pension system******Tax treatment of contributions***

Employer contributions into occupational pension plans are not considered as taxable income for the employee up to 20% of the employee's ordinary earnings. However, employer contributions are taxed at the rate of 20%. This tax is due by the employer.

Employee contributions into occupational pension plans are tax deductible up to EUR 1 200 a year. Excess contributions are taxed at the marginal rate of income tax.

Contributions into individual pension savings contracts are tax deductible up to a limit of EUR 3 200 if some conditions are fulfilled. Excess contributions are taxed at the marginal rate of income tax. Individuals can claim a tax deduction for contributions into individual pension savings contracts if he/she fulfils the following conditions:

- Contributions are made into an insurance company or a credit institution accredited by Luxembourg or the insurance company/credit institution has its head office in another European Union Member State.
- The contract is held at least 10 years.
- Lump sum payments or the start of annuity payments are only possible when the insured person is between 60 and 74 years.
- The contract excludes early withdrawal.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income (annuities and/or lump sums, programmed withdrawals are not allowed) from occupational pension plans is divided into the part from the insured period after 1 January 2000 and the part from the insured period before 1 January 2000. The part from the insured period after 1 January 2000 is tax exempt, while the part from the insured period before 1 January 2000 is taxed at the marginal rate of income tax.

Pension income from individual pension savings contracts receives a favourable tax treatment if the conditions described above are fulfilled:

- Lump sums are taxed as “extraordinary income”. Extraordinary income is taxed at the rate of half the global effective tax rate. The global effective tax rate is the ratio between the tax due assuming that all taxable income is ordinary income and the taxable income (ordinary plus extraordinary incomes). Ordinary incomes are taxed at this rate and extraordinary incomes at 50% of this rate.
- 50% of annuities are tax exempt and 50% are taxed at the marginal rate of income tax.

Non-tax incentives

No such incentives.

Social treatment

Social contributions are levied on private pension contributions.

When people have to file an income tax declaration, excess contributions to occupational pension plans or individual pension savings contracts are also subject to employment fund tax at the rate of 7% or 9% depending on their taxable income. For example, an individual having a global effective tax rate at 20.44% and a taxable income below EUR 150 000 will be taxed at a rate of $20.44\% \times (1+7\%) = 21.87\%$.

Social contributions are levied on pension income.

When people have to file an income tax declaration, pension income is also subject to employment fund tax at the rate of 7% or 9% depending on the taxable income.

Tax treatment of pensioners

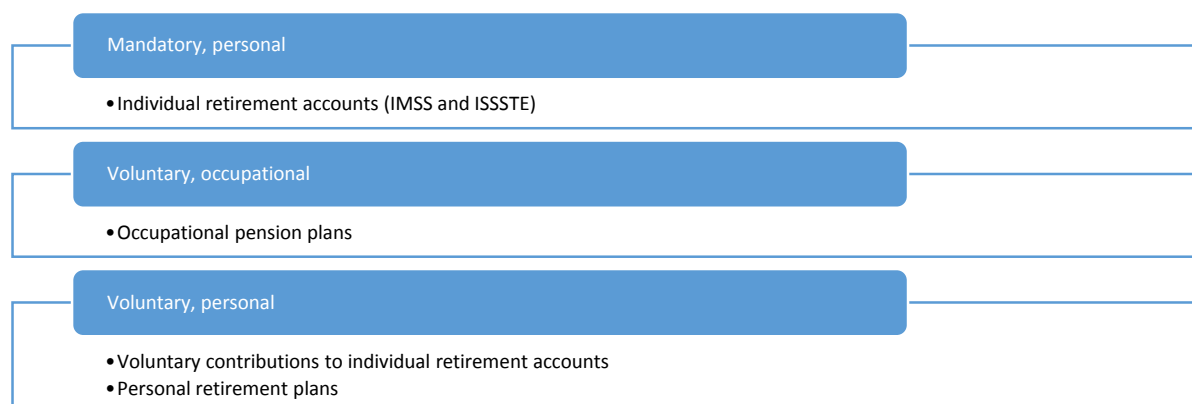
Public pensions are taxed at the marginal rate of income tax after tax deductions (wage earners and pensioners receive a maximum refundable tax credit of EUR 600 per year).

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into complementary pension plans are tax deductible from corporate tax up to 20% of the employee's ordinary earnings.

Mexico

Structure of the funded private pension system



Tax treatment of contributions

Mandatory employer contributions to individual retirement accounts, as well as government contributions and social quotas are not considered as taxable income for the employee. Mandatory employee contributions to individual retirement accounts are tax exempt as they are made from before-tax income.

The tax treatment of voluntary personal contributions depends essentially on whether these savings have a long-term perspective or not. Short-term voluntary contributions, which can be withdrawn at any time after a period from two to six month depending on the pension fund, are not tax deductible. They are made from after-tax income and therefore taxed at the individual's marginal rate of income tax. All the other types of voluntary personal contributions have a long-term perspective and are tax deductible up to different limits, as described in Table A A.10.

Voluntary employer contributions to individual retirement accounts or to occupational pension plans are never considered as taxable income for the worker. However, the maximum deductible amount of contributions to occupational plans (12.5% of the employee's salary) includes both employee and employer contributions.

There is a general limit in the income tax system for personal deductions. This limit is equal to the minimum between five times the annual minimum wage and 10% of the taxpayer's total gross income. The general deduction limit applies to the sum of complementary contributions to individual retirement accounts, long-term voluntary contributions to individual retirement accounts, contributions to special savings for retirement accounts, and contributions to personal pension plans.¹⁹

Table A A.10. Mexico: Tax treatment of pension contributions by workers, by type of contribution

Type of contribution	Tax treatment
Mandatory contributions to individual retirement accounts (IRAs)	Exempt
Short-term voluntary contributions	Not deductible
Complementary contributions to IRAs	Deductible up to the lowest of 5 AMW or 10% of taxable income
Long-term voluntary contributions to IRAs	Deductible up to the lowest of 5 AMW or 10% of taxable income
Contributions to special savings for retirement accounts	Deductible up to MXN 152 000 per year
Contributions to private occupational pension plans	Deductible up to 12.5% of salary (includes both employee and employer contributions)
Contributions to personal pension plans	Deductible up to the lowest of 5 AMW or 10% of taxable income

Note: AMW = annual minimum wage.

Tax treatment of returns on investments

Investment income is always tax exempt as long as it stays invested. Upon withdrawal, investment income remains tax exempt when generated by mandatory contributions to individual retirement accounts, long-term voluntary contributions to individual retirement accounts, contribution to special savings for retirement accounts, and contributions to occupational and personal pension plans.

The real interests earned from investing short-term voluntary contributions and complementary contributions to individual retirement accounts is considered as taxable income upon withdrawal and taxed at the individual's marginal rate. A provisional withholding tax of 0.6% of the amounts contributed applies.²⁰

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

The tax treatment of pension income depends primarily on two factors: the form of payment and whether the individual is entitled to a pension when money is withdrawn (see Table A A.11). When workers reach retirement age and get benefits in the form of an annuity or programmed withdrawals, these benefits are tax exempt up to a limit equivalent to 15 times the annual minimum wage. Benefits above this limit are taxed at the marginal rate. This limit applies to the sum of all pension payments or benefits paid by the federal government (pay-as-you-go defined benefit pensions), by pension funds (individual retirement accounts), by occupational pension plans and by personal pension plans.

Workers entitled to a pension may also take their benefits in the form of a lump sum. For example, when they have accumulated enough assets to buy a life annuity equivalent to 1.3 times the minimum guaranteed pension, they have the right to buy such an annuity and withdraw the rest of the assets as a lump sum. In that case, the amounts withdrawn enjoy a tax exemption of 90 times the daily minimum wage. The excess amount is considered as taxable income and is taxed at the average annual rate applicable to

ordinary income. Moreover, lump sum payments originated from short-term voluntary contributions are tax free, once the tax levied on real interests has been deducted.

Table A A.11. Mexico: Tax treatment of pension withdrawals, by type of contribution and form of payment

Type of contribution	Annuity / programmed withdrawal	Lump sum	Withdrawal while not entitled to a pension
Mandatory contributions to individual retirement accounts (IRAs)	Exempt up to 15 AMW; Excess taxed at marginal tax rate	Exempt up to 90 DMW annually; Excess taxed at average tax rate	Exempt up to 90 DMW for each year of contribution; Excess taxed at marginal tax rate with a provisional withholding tax of 20%
Short-term voluntary contributions	Not applicable	Exempt	Exempt
Complementary contributions to IRAs	Exempt up to 15 AMW; Excess taxed at marginal tax rate	Exempt up to 90 DMW annually; Excess taxed at marginal tax rate	Taxed at average tax rate with a provisional withholding tax of 20%
Long-term voluntary contributions to IRAs	Exempt up to 15 AMW; Excess taxed at marginal tax rate	Exempt up to 90 DMW annually; Excess taxed at average tax rate	Taxed at average tax rate with a provisional withholding tax of 20%
Contributions to special savings for retirement accounts	Not applicable	Taxed at marginal tax rate	Taxed at marginal tax rate
Contributions to occupational private pension plans	Exempt up to 15 AMW; Excess taxed at marginal tax rate	Exempt up to 90 DMW annually; Excess taxed at average tax rate	Taxed at 30%
Contributions to personal pension plans	Exempt up to 15 AMW; Excess taxed at marginal tax rate	Exempt up to 90 DMW annually; Excess taxed at average tax rate	Taxed at marginal tax rate with a provisional withholding tax of 20%

Notes: AMW = annual minimum wage; DMW = daily minimum wage.

When the worker gets a lump sum payment because he/she does not fulfil the requirements for obtaining a pension from his/her individual retirement account (*negativa de pensión*), this payment is tax exempt up to 90 times the daily minimum wage for each year of contribution. The excess amount is considered as sporadic taxable income and is subject to a temporary 20% withholding tax. The 20% withholding tax becomes final when the taxable income is less than MXN 123 580.20.

Amounts withdrawn before retirement from personal pension plans and retirement accounts constituted by complementary contributions and long-term voluntary contributions are considered as taxable income. A withholding tax of 20% is applied on the capital and the updated interest income generated by that capital.

Finally, amounts withdrawn from the special savings for retirement accounts are considered as taxable income. However, the tax rate applied cannot be higher than the one in force at the time of the deposit.

Non-tax incentives

Solidarity savings are a federal government matching mechanism to encourage public-sector workers affiliated to the pension system to make voluntary contributions. For each peso that the worker contributes voluntarily for retirement purposes, the federal

government in its capacity as employer contributes 3.25 pesos. Workers can contribute either 1% or 2% of their salary. Solidarity savings have the same tax treatment as mandatory contributions (contributions are made from before-tax income, return on investment is tax exempt and withdrawals are treated as mandatory pensions).

Social treatment

Social contributions are levied on the gross salary, and therefore on pension contributions.

Pension income is not subject to social security contributions.

Tax treatment of pensioners

Public pensions are tax exempt up to an amount equivalent to 15 times the annual minimum wage. Benefits above this limit are taxed at marginal tax rate. This limit applies to the sum of all pension payments or benefits paid by the federal government (pay-as-you-go defined benefit pensions), by pension funds (individual retirement accounts), by occupational pension plans and by personal pension plans.

Incentives for employers to set up or contribute to a funded private pension plan

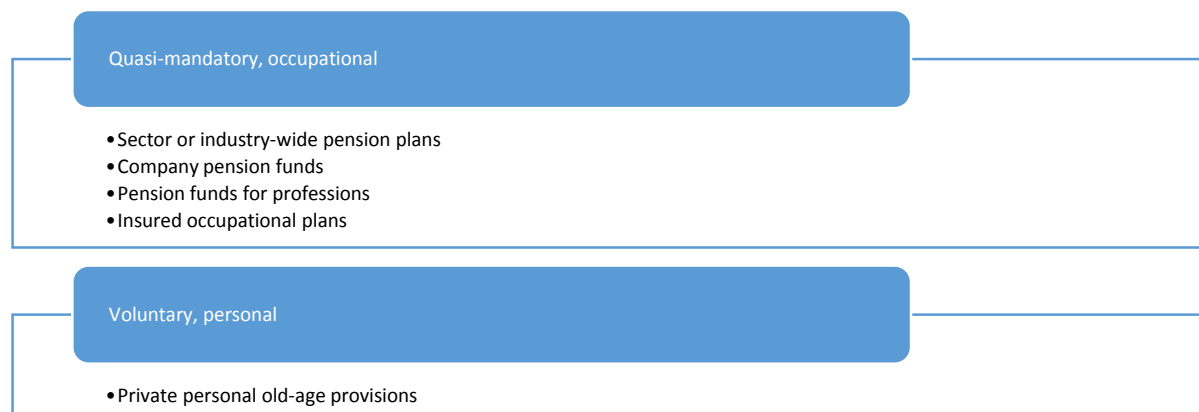
Mandatory employer contributions to the retirement sub-account and to the housing sub-account are tax-deductible for the employer.

Complementary retirement contributions done by the employer and employer contributions to occupational private pension plans are partially deductible for the employer. The amount deductible cannot exceed 47% of the contributions made. However, 53% of the contributions can be deducted when the benefits provided by the employer to its employees in a given tax year are not lower than the benefits provided the previous year.

Employer contributions to occupational private pension plans are not considered into the employee's basic salary if the pension plan is registered in the database created by the pension authority. This process gives the opportunity to reduce the employer's cost of giving this occupational plan.

Netherlands

Structure of the funded private pension system



Tax treatment of contributions

The maximum income for the EET system is set at EUR 105 075 in 2018. For the income that exceeds EUR 105 075 a TEE system can apply. This means that an individual with an income above EUR 105 075 contributes a certain percentage of his/her income to a mandatory occupational pension plan, but the income taken into account to calculate the contribution is capped at EUR 105 075. If s/he wants to make extra contributions, s/he has to open a voluntary pension plan and the contributions in that plan are not tax-deductible (investment income and capital gains are tax exempt, as well as the benefits of this voluntary pension plan). This two-tiered system was introduced on 1 January 2015. The maximum income is indexed to minimum wage.

EET system

Contributions to an occupational plan are not considered as taxable income to the employee. Second pillar contributions are normally set in collective pension agreements, and are typically shared between employers and employees. Employers usually pay a higher share (roughly two-thirds).

With reference to contributions to an occupational plan, the tax relief is limited in the EET system. For DB plans, the pension that can be granted in a year is limited (the benefit is defined). For DC plans, the contribution is limited.

- **Occupational DB plans:** The pension that can be granted in any working year (the received entitlement concerning a working year) cannot exceed 1.875% of the career-average salary minus a threshold for the first pillar (general state pension) if the retirement age is 68 years old. After 40 working years, this can lead to a pension of 75% of the average salary. In terms of final salary, the pension that can be granted in any working year cannot exceed 1.657%.
- **Occupational DC plans:** Tax rules define the maximum total contributions. Those maximum contributions differ and depend on the age of the participant and the participant's personal situation (e.g. is a pension for a partner included, and if so, in what form). These contributions vary from 3.2% to 4.6% (for employees aged

15 to 19 years old) up to 22.3% to 27.3% (for employees aged 65 to 67 years old) of the salary minus the threshold for the first pillar.

Contributions to private personal old-age provisions are tax-deductible up to a limit. Contributions are limited to 13.3% of the annual income (with a ceiling of EUR 105 075) minus a threshold for the first pillar (general state pension) and taking into account the accrued pensions rights in the occupational pension plan (to prevent accumulation and tax relief for early retirement).

TEE system

Contributions made under the TEE system are taxed at the individual's marginal income tax rate.

Contributions to occupational DC pension plans are limited as well. The maximum contributions depend on the age and range from 2.2% (age category 15-19 years old) up to 13.1% (age category 65-67 years old).

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Income from occupational and personal pension plans under the EET system is taxed at the individual's marginal income tax rate.

Income from occupational and personal pension plans under the TEE system is not taxed.

Lump sum payments are generally not permitted, unless the annuity payment is very small (EUR 474.11 in 2018 for occupational plans), and these payments are taxed as income. The occupational pension capital cannot be paid out as a lump sum to the employee. For personal pension plans, the total lump sum payment cannot exceed EUR 4 351 (in 2018; indexed to inflation).

Non-tax incentives

No such incentives.

Social treatment

EET system: Social contributions are not levied on pension contributions.

TEE system: The contributions for occupational pensions or private personal old-age provisions are not exempt or deductible from the taxable income. The individual has to pay tax and social contributions on the taxable income (there is no difference with other taxable income; in case of wages, the tax and social contributions are normally withheld by the employer).

Pensioners pay 9.75% of their taxable income for the general insurance of certain health costs and survivors' pensions (WLZ, ANW, up to an income of EUR 33 994). Depending

on their income, they pay for their own health insurance. The social contributions are less than the contributions for those below the age from which the general state pension payments are received (66 years in 2018).

Tax treatment of pensioners

Pension income is taxed if the EET system applies. Tax is calculated by applying the marginal income tax rate (box 1 income).

A general personal tax credit is available to all taxpayers. The amount of the general tax credit depends on the age of the individual and the level of the individual's income.

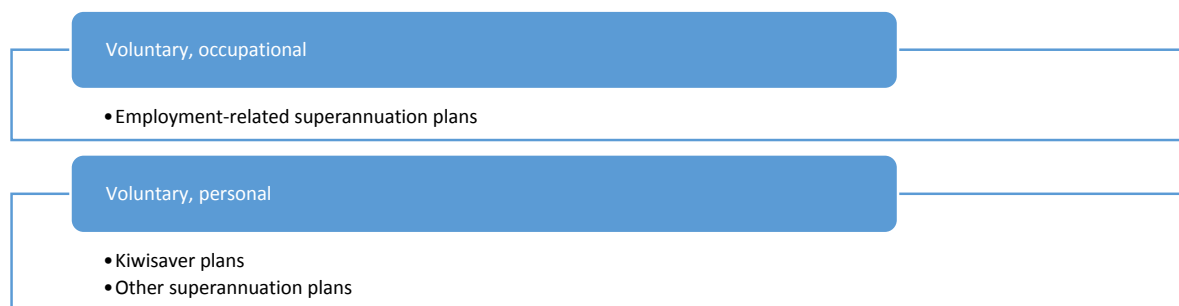
- For individuals below state pension age: If the individual's income is below EUR 20 142, the tax credit is EUR 2 265. Between EUR 20 142 and EUR 68 507, the tax credit is calculated according to this formula: $[2\,265 - 4.683\% \times (\text{income} - 20\,142)]$. If the income is above EUR 68 507 the tax credit is EUR 0.
- For individuals at or above state pension age: If the individual's income is below EUR 20 142, the tax credit is EUR 1 157. Between EUR 20 142 and EUR 68 507, the tax credit is calculated according to this formula: $[1\,157 - 2.389\% \times (\text{income} - 20\,142)]$. Above EUR 68 507, the tax credit is EUR 0.

Incentives for employers to set up or contribute to a funded private pension plan

No such incentives.

New Zealand

Structure of the funded private pension system



Tax treatment of contributions

Employees' contributions are taxed at the marginal rate of income tax.

Employers' contributions are also liable for tax (called employer superannuation contribution tax, ESCT). The ESCT rate is calculated based on the employee's salary or wages in the previous tax year (including gross superannuation employer contributions). When the employee was not employed for all the previous tax year, the tax rate is calculated based on an estimate of the total amount of salary or wages that the employee will earn in the year ahead.

- If salary $\leq$ NZD 16 800 then ESCT rate=10.5%
- If salary from NZD 16 801 to NZD 57 600 then ESCT rate=17.5%
- If salary from NZD 57 601 to NZD 84 000 then ESCT rate=30%

- If salary $\geq$ NZD 84 001 then ESCT rate=33%

There are two alternative ways to calculate ESCT rates:

- the employee's marginal rate of income tax, by treating employer contributions as part of the employee's salary or wages, with the agreement of both employer and employee; or
- for employer contributions made on behalf of a past employee, a fixed tax rate of 33% applies.

Tax treatment of returns on investments

Investment earnings are taxed. The pension provider directly deducts this tax from the pension account.

If the scheme is a widely-held superannuation fund, investment earnings are taxed at 28%.

The tax rate for investment earnings from a Portfolio Investment Entity (PIE) is referred to as the prescribed investor rate (PIR). All of the KiwiSaver default schemes are PIEs. Dividends from a listed PIE are not liable for resident withholding tax. The PIR is calculated based on taxable income in each of the previous two income years.

- If, in either of the previous two income years, taxable income was $\leq$ NZD 14 000 and (taxable income + PIE income) $\leq$ NZD 48 000 then PIR=10.5%;
- If, in either of the previous two income years, taxable income was $\leq$ NZD 14 000 and (taxable income + PIE income) from NZD 48 000 to NZD 70 000 then PIR=17.5%;
- If taxable income $\leq$ NZD 14 000 and (taxable income + PIE income) $\geq$ NZD 70 001 for both of the previous two income years, then PIR=28%;
- If, in either of the previous two income years, taxable income was from NZD 14 001 to NZD 48 000 and (taxable income + PIE income) $\leq$ NZD 70 000 then PIR=17.5%;
- If taxable income from NZD 14 001 to NZD 48 000 and (taxable income + PIE income) $\geq$ NZD 70 001 for both of the previous two income years, then PIR=28%;
- If taxable income $>$ NZD 48 000 then PIR=28%.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Payments from superannuation funds and from KiwiSaver plans, whether in the form of an annuity, lump sum or pension, are not taxable in the hands of recipients.

Non-tax incentives

The government makes an annual contribution towards KiwiSaver accounts as long as members contribute and are aged 18 and over (and satisfy some additional criteria). The government pays 50 cents for every dollar of member contribution annually up to a maximum payment of NZD 521.43. The member tax credit does not count as taxable

income for the member. Members no longer qualify for member tax credit once they become eligible to withdraw their savings.

Employees' contributions to a KiwiSaver account (minimum 3% of the salary) are matched by a minimum employer contribution of 3% of the employee's salary.

Social treatment

Social contributions are not levied on pension contributions.

Social contributions are not levied on pension income.

Tax treatment of pensioners

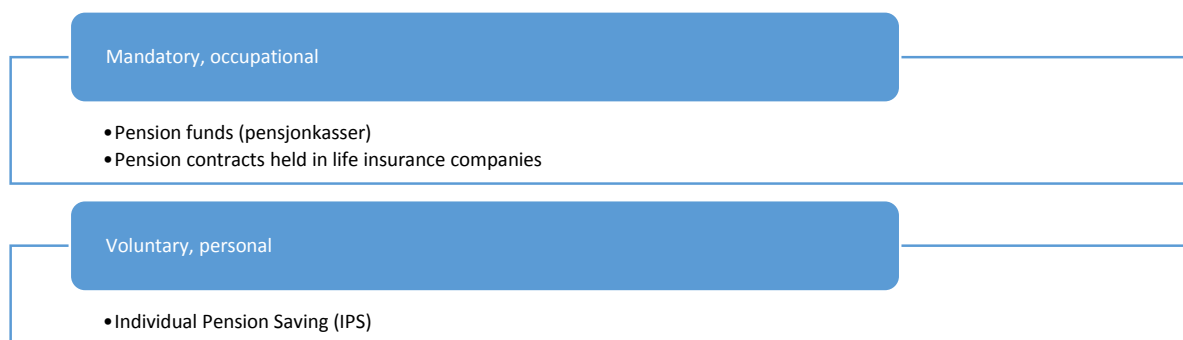
New Zealand Superannuation (public pension) is taxed at marginal rates.

Incentives for employers to set up or contribute to a funded private pension plan

No such incentives.

Norway

Structure of the funded private pension system



Tax treatment of contributions

Employer contributions to mandatory occupational pension plans are not considered as taxable income to the employees.

Employees usually do not contribute to mandatory occupational pension plans, but they are sometimes required to do so. In case employees are required to contribute, the contribution rate must not exceed 2% of salary in municipal and public sector DB plans and 4% of salary in private sector plans. Contributions are deductible from ordinary income. They are not deductible from personal income.

Contributions by self-employed workers into voluntary defined contribution occupational plans are deductible from both ordinary income and personal income, up to 6% of imputed personal income from self-employment between 1 and 12 G.²¹

Individual contributions to individual pension saving (IPS) schemes are deductible from ordinary income, up to NOK 40 000. They are not deductible from personal income.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income from occupational pension plans is taxed as both personal and ordinary income. Pension income from the IPS scheme is taxed only as ordinary income. Lump sum payments are not allowed.

Non-tax incentives

No such incentives.

Social treatment

Employers pay social contributions on their occupational pension contributions at a maximum rate of 14.1%.

Pension income is subject to 5.1% of social contribution, which is lower than contribution rates on other types of income (employees pay 8.2%).

Tax treatment of pensioners

Public pension income is taxed as both personal and ordinary income.

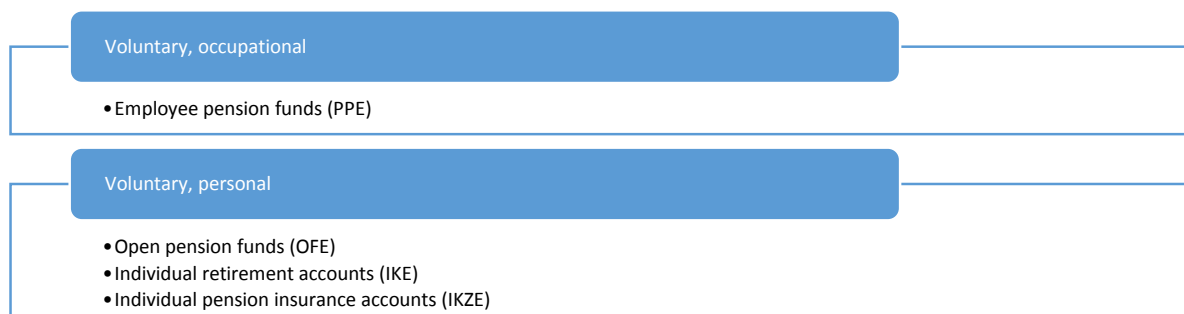
Old-age pensioners are entitled to a special tax credit. In 2018, the maximum tax reduction was NOK 29 950. The tax credit is tapered by 15.3% of pension income above NOK 193 250 and 6% of pension income above NOK 290 700. There is no tax credit for pension income above NOK 541 000.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions to mandatory occupational pension plans are tax-deductible as business expenses according to the Norwegian Taxation Act. Employer contributions to collectively negotiated labour market pensions have also become tax-deductible as business expenses through administrative practice at the taxation authorities.

Poland

Structure of the funded private pension system



Tax treatment of contributions

Contributions into OFE are tax deductible.

Contributions into IKZE are tax deductible up to a limit. Annual contributions into IKZE are capped at 1.2 times the national projected average monthly salary (PLN 5 331.60 in 2018). If the individual exceeds this limit, the financial institution has to return the excess contributions or to forward them to another account.

Employer contributions into PPE (so-called basic contributions) are included in the taxable income of the employee and consequently taxed at the marginal rate of income tax. Employee contributions (so-called additional contributions) are paid from earnings that have been already taxed. Employee contributions into PPE cannot exceed 450% of the national projected average monthly salary (PLN 19 993.50 in 2018).

Contributions into IKE are taxed at the marginal rate of income tax in the sense that contributions are made from after-tax earnings and do not benefit from tax reliefs. Annual contributions into IKE cannot exceed 300% of the national projected average monthly salary (PLN 13 329 in 2018). If the individual exceeds this limit, the financial institution has to return the excess contributions or to forward them to another account.

Tax treatment of returns on investments

Returns on investments are not taxed. Early withdrawal from IKE and IKZE is possible, but in this case returns on investments are taxed at 19%.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Ten years before the official age of retirement, assets in OFE are subject to graduate transfer to ZUS sub-account (in 10% per year pace), due to so called security slide mechanism. At the age of retirement, all assets are completely transferred to the first pillar, from which the individual receives total pension which is taxed at the marginal rate of income tax.

IKZE benefits can be paid after age 65 as lump sums or regular payments and are taxed at a fixed rate of 10%. Early withdrawal is possible, but all accrued tax benefits must be surrendered.

Any withdrawal after 60 from PPE or IKE is tax free. There are no specific rules regarding payment options. Early withdrawal from PPE is not possible. Early withdrawal from IKE is possible but in this case, returns on investments are taxed at 19%.

Non-tax incentives

No such incentives.

Social treatment

Employer contributions into PPE are not included into income subject to social contributions.

Pension income is not subject to contributions for pensions, unemployment insurance etc. However, there is a tax-deductible health-insurance contribution. The contribution is deducted from an amount of due personal income tax (7.75%) and from incomes after taxation (1.25%).

Tax treatment of pensioners

Public pensions are subject to income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into PPE are tax deductible from corporate tax, up to 7% of the employee's salary.

Portugal

Structure of the funded private pension system



Tax treatment of contributions

Contributions to occupational pension plans are, in terms of amount, mostly employer contributions. Employer contributions are not considered as taxable income for the

employee and are tax deductible from the employer taxable profits as long as the legal required criteria are met, namely:

- All permanent workers of the company are enrolled in the pension plan and the benefits are established in accordance with an objective criteria that applies to all workers;
- The annual contributions made by the employer do not exceed 15% of the annual total costs with wages and salaries (the limit is 25% if employees are not covered by social security such as pension plans under a collective agreement in the banking sector). If the contributions exceed the limit, the exceeding part is not considered as a cost for the company for tax purposes, unless the amounts are included in the employee's taxable income;
- At the time of retirement, at least two thirds of the benefits are paid in the form of annuities;
- The pension plan covers exclusively benefits in case of retirement, early retirement, supplementary retirement, health (post-work), disability or survivorship and follows, in what concerns age and holders/beneficiaries, the general social security framework;
- The management and disposal of these employer contributions do not belong to the company itself;
- Contributions are not considered income from employment.

Employer contributions to retirement savings schemes (PPR) are also not considered as taxable income for the employee. The legal requirements above do not apply as this type of contribution is always considered as income from employment and deductible from the employer's taxable profits.

20% of overall employee contributions to private pension plans (both occupational and personal) are tax deductible, up to a yearly deduction limit which varies according to the individuals' age: EUR 400 per taxpayer under 35 years old, EUR 350 per taxpayer between 35 and 50 years old, and EUR 300 per taxpayer above 50 years old. In the case of contributions to the public regime of capitalisation (RPC), only two age limits apply: EUR 400 per taxpayer under 35 years old and EUR 350 per taxpayer older than 35. In addition, an overall limit applies for deductions related to certain expenses, namely health, health insurance, residence for the elderly and tax benefits (including tax benefits related to the above-mentioned contributions to private pension plans) when the annual income exceeds EUR 7 091. Between EUR 7 092 and EUR 80 640 the limit for tax deductions varies between EUR 2 500 and EUR 1 000. For an annual income above EUR 80 640, the maximum deduction available is EUR 1 000.

Tax treatment of returns on investments

Generally, the income generated by private pension assets is tax exempt.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

If the contributions were exempt (employer contributions to occupational pension plans), the following tax treatment applies:

- Annuities: Taxed at the individual's marginal rate of income tax. A maximum deduction of EUR 4 104 applies to total pension income. However, if the compulsory contributions to social protection schemes and to legal health subsystems exceed that limit (EUR 4 104), the deduction will be equal to the total amount of contributions.
- Lump sums: One-third of the "contribution part" (capital component) is tax exempt up to a maximum of EUR 11 704.70. The remainder is taxed at the individual's marginal rate of income tax. The "gains and other returns on investment part" is taxed at a rate of 4% or 8% depending on whether the contributions that originated such income were made before or after 1 January 2006 respectively.

If the contributions were taxed (employee contributions to occupational and personal pension plans, as well as employer contributions when legal criteria are not met for receiving a favourable tax treatment), the following tax treatment applies:

- Annuities: The "contributions part" is exempt and only the "gains and other returns on investment part" is subject to taxation at the marginal rate of income tax. If it is not possible to distinguish between contributions and returns, then only 15% of the annuity is subject to taxation at the marginal rate of income tax.
- Lump sum: The "contributions part" is exempt. The "gains and other returns on investment part" is taxed at a rate of 4% or 8% depending on whether the contributions that originated such income were made before or after the 1 January 2006 respectively.

The interest income subject to taxation can be reduced if more than 35% of the contributions are paid in the first half of the contract, and the benefits are received more than 5 years after the beginning of the contract (5 to 8 years: 80% of the interest is taxed; more than 8 years: 40% of the interest is taxed).

Withdrawals from retirement savings plans (PPR) under the following conditions are not subject to penalties: (i) old-age retirement; (ii) long-term unemployment of the participant or any member of their household; (iii) permanent disability of the participant or any member of their household; (iv) severe illness of the participant or any member of their household; (v) at the age of 60; (vi) for payment of instalments of mortgage-backed credit on the participant's own permanent residence.

Withdrawals outside the above conditions are subject to penalties. The year of withdrawal, the individual has to add to his/her taxable income the full amount of tax deductions received on contributions over the years, plus an annual penalty rate of 10% applied to the tax deductions for each year since the contribution has been made. This is then taxed at the individual's marginal rate. For example, if the individual has made a contribution of EUR 300 eight years ago, the penalty for that contribution will be calculated as the tax deduction received on that contribution ($20\% \times 300$) multiplied by $8 \times 10\%$.

Non-tax incentives

No such incentives.

Social treatment

Social contributions are not levied on employer pension contributions.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Public pensions are considered as income and taxed at the individual's marginal income tax rate.

There is a general deduction for pensions of EUR 4 104 or, when higher, of the total amount of the mandatory social security contributions.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions to occupational pension plans are tax-deductible expenses as long as some requirements are fulfilled (see above). Besides this relief on corporate income tax, social contributions are not levied on employer pension contributions.

Slovak Republic

Structure of the funded private pension system



Tax treatment of contributions

Employers have to pay mandatory contributions on behalf of employees enrolled in an individual retirement account (4.5% of the salary in 2018, increasing by 0.25 percentage point each year until reaching the target of 6% in 2024). Mandatory contributions are fully tax deductible.

Employees can make additional voluntary contributions in their individual retirement account. There is no cap on the amount an employee can contribute voluntarily and these contributions are not tax deductible.

Employer contributions into supplementary pension plans are treated as employee's income and taxed at the employee's marginal rate.

Employee contributions into supplementary pension plans are tax deductible up to EUR 180, only if the participant opts for new pay-out conditions. Excess contributions are taxed at the marginal rate of income tax. New pay-out conditions are in place since 1 January 2014 for all new entrants. Participants who joined the scheme prior to 1 January 2014 can decide to conclude with their supplementary pension company a contract amendment with new pay-out conditions. However, if they opt not to choose to sign this contract amendment, they will not become eligible for the EUR 180 tax relief.

Tax treatment of returns on investments

Returns on investment into individual retirement accounts are tax exempt.

Returns on investment are taxed upon withdrawal for supplementary pension plans (both those gained during the accumulation phase and the pay-out phase). A fixed tax rate of 19% applies.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income from individual retirement accounts is tax exempt.

Upon withdrawals from supplementary pension plans, only the part of the assets originated from returns on investment is taxed at 19%. The other part (originated from contributions) is tax free.

Non-tax incentives

No such incentives.

Social treatment

Mandatory pension contributions are part of the social insurance contributions: 25.2% of the salary paid by the employer and 9.4% of the salary paid by the employee. Health insurance contributions (10% of the salary paid by the employer and 4% of the salary paid by the employee) and social insurance contributions are calculated based on the gross salary.

Voluntary contributions to individual retirement accounts and individual contributions to supplementary pension plans are subject to social contributions, as they are paid from net income.

Employer contributions to supplementary pension plans are considered as income and are subject to health insurance contributions (but not to social insurance contributions).

Social contributions are not levied on pension income.

Tax treatment of pensioners

Public pensions are not taxed.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into supplementary pension plans are tax deductible for the employer (corporate tax) up to 6% of the member's salary. Employer contributions into supplementary pension plans are not subject to social insurance contributions but health insurance contributions are levied on these contributions.

Slovenia

Structure of the funded private pension system

Voluntary, occupational and personal

- Mutual pension fund
- Umbrella pension fund
- Guarantee fund

Tax treatment of contributions

Employer contributions are not included in employee's taxable income up to 5.844% of the employee's gross wage.²² This cap cannot exceed EUR 2 819.09 per year.

Individual contributions to occupational and personal pension plans attracting tax deduction are capped by the unused cap of employer contributions attracting tax relief. If contributions are paid by both the employer and the employee, and the total amount of contributions exceeds the maximum contribution entitled to tax relief, the employee may only receive tax relief on the difference between the contribution paid by the employer and the maximum contribution. Excess contributions are taxed at the marginal rate of income tax.

Employer and employee contributions benefit from tax relief if the pension plan is approved by the ministry of labour and entered into a special register kept by the competent tax authority. The sum of employer and employee contributions into pension plans cannot be lower than EUR 240 a year.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Annuities and lump sums are taxed at the marginal rate of income tax.

Non-tax incentives

No such incentives.

Social treatment

Employer contributions above 5.844% of the employee's gross wage or above EUR 2 819.09 are subject to social contributions. Contributions within the limit are not subject to social contributions.

Employee contributions are made from income that has already been subject to social contributions.

Income from private pension schemes is not subject to social contributions.

Tax treatment of pensioners

Pensions from the public scheme are taxed at the marginal rate of income tax and benefit from a tax credit. The tax credit is equal to 13.5% of resident pensioners' pensions received from compulsory pension and disability insurance.

Incentives for employers to set up or contribute to a funded private pension plan

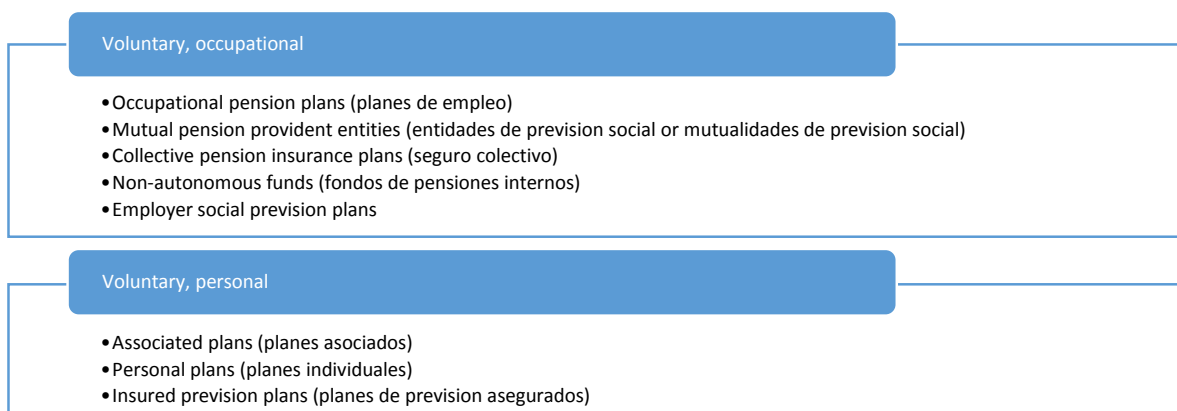
Employer contributions are tax deductible from corporate tax up to 5.844% of the employee's gross wage. This cap cannot exceed EUR 2 819.09 per year.

Employer and employee contributions benefit from tax relief if the pension plan is approved by ministry of labour and entered into a special register kept by the competent tax authority. The sum of employer and employee contributions into pension plans cannot be lower than EUR 240 a year.

Employer contributions above 5.844% of the employee's gross wage or above EUR 2 819.09 are subject to social contributions. Contributions within the limit are not subject to social contributions.

Spain

Structure of the funded private pension system



Tax treatment of contributions

Employer contributions count as income to the employee.

Total employer and employee contributions made to personal and occupational pension plans are limited to EUR 8 000 per year. Additional contributions are not permitted. In addition, a tax-deductibility limit applies to total contributions. The limit for 2018 is the lesser of (i) 30% of the aggregate net income from work and economic activities, and (ii) EUR 8 000.

The individual can additionally deduct up to EUR 2 500 per year for contributions paid to his/her spouse's pension plan when the spouse's net earned and business activities income is less than EUR 8 000. The additional deduction can be carried forward for five years.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income is taxed as labour income at the individual's marginal rate of income tax. The same tax treatment applies to lump sums and annuities (except lump sums arising from contributions made before 2007) and to early withdrawals.

Until 2007, 40% of pension income received as a lump sum was tax free. A transitional regime applies, with lump sums arising from contributions made before 2007 taxed in this way under specific conditions and others fully taxed. Conditions to benefit from tax-free lump sums are the following:

- People who retired before 2011 can only benefit from tax-free lump sums if they withdraw money before 2018;
- People who retired between 2011 and 2014 can only benefit from tax-free lump sums if they withdraw money at most 8 years after retirement;
- People retiring as of 2015 can only benefit from tax-free lump sums if they withdraw money at most 2 years after retirement.

Non-tax incentives

No such incentives.

Social treatment

Only employer contributions to private pension plans are included for the calculation of social security contributions.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Public pension income is taxed as labour income at the individual's marginal rate of income tax.

The income exempt from income tax is EUR 5 550 per taxpayer under the age of 65. Taxpayers aged over 65 may add EUR 1 150 to the former amount. Those aged over 75 years may claim additionally EUR 1 400.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions to occupational pension plans are tax exempt for the employer.

Sweden

Structure of the funded private pension system



Tax treatment of contributions

Employee's contributions to PPM are offset with a tax credit.

Contributions to occupational plans are only financed by employers. These contributions are not considered as taxable income to the employee.

From 1 January 2016, only the self-employed and employees without employer contributions to their pensions can deduct contributions to pension insurance contracts or IPS schemes. For these persons, the cap for individual contributions is 35% of eligible income or at most 10 basic amounts (SEK 455 000 in 2018) per year. Eligible income for the self-employed is essentially defined as surplus from active business activities. To be eligible for tax relief, benefits cannot be withdrawn before the age of 55, and payments must last at least for 5 years in the form of an annuity.

Tax treatment of returns on investments

Returns on investment are not taxed in PPM schemes.

For occupational and personal pension schemes, returns are taxed at a fixed rate of 15% on an imputed return on investment. The imputed return corresponds to the previous year's average government borrowing rate, but it cannot be negative.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income is taxed as earned income at the individual's marginal income tax rate.

Non-tax incentives

No such incentives.

Social treatment

A reduced social contribution of 24.26% (instead of 31.42%) is applied on contributions for occupational pensions paid by the employer.

Social contributions are not levied on pension income.

Tax treatment of pensioners

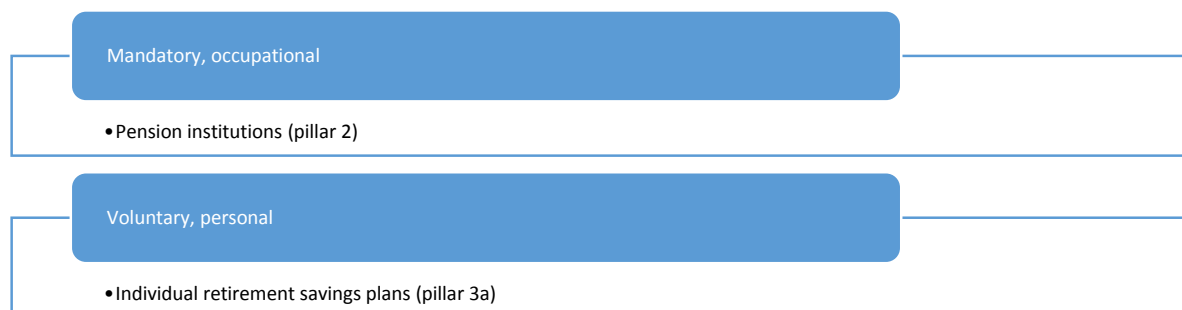
Public pension income is taxed as earned income.

A basic allowance is given for assessed earned income and varies between SEK 19 246 and SEK 34 900, depending on income. Individuals aged over 65 get an additional allowance, which amount also varies with income.

Incentives for employers to set up or contribute to a funded private pension plan

Employers can deduct 35% of maximum 10 basic amounts (SEK 455 000 for 2018) for contributions to different pension schemes.

There is also a possibility for the employer to use a supplementary provision in cases when a pension agreement is changed or a new agreement is met on early retirement from an employment. Furthermore, the supplementary provision can be used if the pension commitments are insufficiently secured. The supplementary provision states that the whole cost for securing a pension commitment can be deducted if it does not oppose conditions stipulated in law.

Switzerland***Structure of the funded private pension system******Tax treatment of contributions***

Employee and employer contributions to occupational pension plans are tax deductible.

Contributions to individual retirement savings plans are tax deductible up to a limit. If the individual has an occupational pension plan, tax-deductible contributions to personal plans are capped at CHF 6 768. If the individual does not have an occupational pension plan, tax-deductible contributions are capped at 20% of annual earnings. In this case, the tax deduction cannot exceed CHF 33 840. Excess contributions are not permitted.

Tax treatment of returns on investments

Returns on investments are not taxed.

Financial transactions are subject to stamp duty, including those done by pension funds. The rate of 0.15% (half paid by each contractor) applies on all securities bought and sold.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

The same tax treatment applies to pension benefits paid by occupational and personal pension plans. Annuities and programmed withdrawals are taxed at the marginal rate of income tax.

The federal government and the regions (cantons) tax lump sums separately from other incomes at preferential rates:

- The federal government taxes lump sums as capital income. This tax is progressive and is equal to 1/5 of the income tax which would be generated if lump sums were separately taxed as income.
- The fiscal treatment of lump sums differs between cantons.

Non-tax incentives

No such incentives.

Social treatment

Contributions to occupational pension plans are part of the social contributions, paid from the gross salary.

Contributions to individual retirement savings plans are paid from disposable income. This income has already been subject to social contributions.

Social contributions are not levied on pension income.

Tax treatment of pensioners

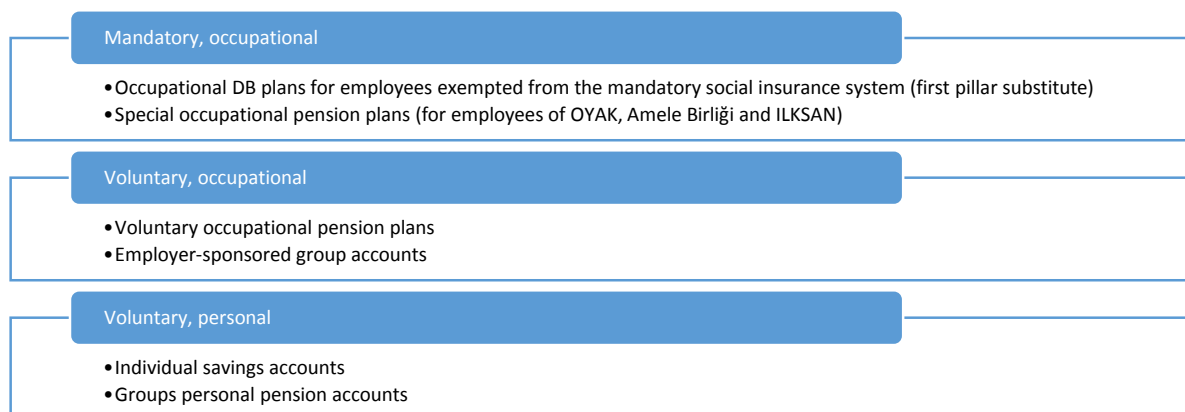
Income from public pension schemes is taxed at the individual's marginal rate of income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into pillar 2 are tax deductible from corporate tax.

Turkey

Structure of the funded private pension system



Tax treatment of contributions

Employee contributions into personal pension plans are deducted from salaries that have already been taxed at the marginal rate of income tax and that have already been subject to stamp tax at the rate of 0.759%. Employee contributions are matched by the government up to a limit.

Employer contributions into employer-sponsored group accounts are included in employee's taxable income. Such contributions do not receive the government match.

Tax reliefs are available only if the pension plan is offered by a pension company established in Turkey.

Tax treatment of returns on investments

Returns on investment into voluntary pension plans are taxed upon withdrawal. The tax rate depends on when the withdrawal takes place:

- If the individual reaches 56 years old and has been in the scheme during 10 years at least, the tax rate is 5%;
- If the individual has been in the scheme during 10 years at least without reaching 56 years old, the tax rate is 10%;
- If the individual has been in the scheme during less than 10 years, the tax rate is 15%.

Individuals can withdraw a lump sum from voluntary pension plans. Only the return on capital component of the lump sum is taxed at a fixed rate, as described above. Part or all of the savings can be converted into an annuity or programmed withdrawal if the individual reaches the age of 56 and has been in the scheme for at least 10 years. Programmed withdrawals are taxed upon each payment made to the member, while the annuities are taxed just before conversion.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income is tax exempt owing to the fact that tax on returns is deducted at the time the total savings amount is converted into an annuity or programmed withdrawal.

Non-tax incentives

The government matches 25% of pension contributions into individual savings accounts or group personal pension contracts up to 25% of the annual minimum wage. The government contribution applies for the automatic enrolment system too, with a separated limit from the one in the individual pension system (i.e. an individual can get the government match twice, within the limit of 25% of the annual minimum wage for each scheme).

Individuals receive 100% of government contributions if they withdraw their assets after reaching 56 years old and if they have contributed for at least 10 years.

If an individual makes an early withdrawal (i.e. if s/he does not fulfil at least one of the two previous conditions), s/he cannot keep all of the matching contributions:

- If the individual stays less than 3 years in the scheme, s/he does not receive the government contribution;
- If the individual stays between 3 and 6 years in the scheme, s/he receives 15% of the government contribution and investment returns generated by these contributions;
- If the individual stays between 6 and 10 years in the scheme, s/he receives 35% of the government contribution and investment returns generated by these contributions;
- If the individual stays more than 10 years in the scheme, s/he receives 60% of the government contributions and investment returns generated by these contributions.

The government matching contribution is paid every month into the pension account. If an individual makes an early withdrawal, he/she is not entitled to 100% of the government contribution and so the relevant percentage of government contributions and the investment returns generated by these contributions are withdrawn from the account.

In the automatic enrolment system, the government pays a one-time TRY 1 000 contribution for individuals who do not opt out within the first two months. The initial government contribution is vested once the employee is entitled to the pension. There is also an incentive to annuitize pension assets in the form of a subsidy equal to 5% of participants' savings at retirement for those who choose a minimum 10-year annuity.

Social treatment

Employer contributions up to 30% of the minimum wage are not included in income subject to social contributions. No relief from social insurance contributions is available for individuals' contributions.

No social contributions are levied on pension income received from the private pension system.

Tax treatment of pensioners

Public pension income is not subject to income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions are deductible from corporate income tax provided that the sum of contributions paid by employers to the individual pension system and personal insurance premiums paid by employees does not exceed 15% of the employee's monthly wage and the monthly minimum wage. If the sum of the two exceeds the limit, the employer and the employee decide upon the priority of the deduction, i.e. deducting first the insurance premiums from the employee's personal income tax or the employer contributions to the individual pension system. If, for example, the priority is to deduct insurance premiums from the employee's personal income tax, the employer can only deduct from corporate income tax the difference between the insurance premiums and the overall limit.

United Kingdom

Structure of the funded private pension system



Workplace pensions include occupational pension schemes, group personal pensions and group stakeholder pensions.

Tax treatment of contributions

Contributions to registered pension schemes benefit from tax relief up to an annual limit (annual allowance). Individuals pay tax at the marginal rate of income tax on any pension savings they have in that tax year above the annual allowance.

- Occupational pension schemes: Usually, the employer takes the pension contributions from the individual's pay, before deducting tax. The individual only pays income tax on what is left. This system of giving tax relief is known as "net pay arrangement". Employees that do not pay tax do not get tax relief on their pension contributions.
- Other workplace pensions: The employer takes the pension contributions from the individual's pay after deducting tax. The pension provider claims tax back from the government at the basic rate of 20% and the tax refund is paid in the pension account. Individuals paying tax at higher rate (40%) or additional rate (45%) can claim the difference through their tax return. The extra tax refund is not paid in the pension account. This system of giving tax relief is known as "relief at source".
- Personal pensions: The relief at source method applies. Individuals pay income tax on their earnings before any pension contribution, but the pension provider

claims tax back from the government at the basic rate (the tax refund is paid in the pension account). Individuals paying tax at higher rate or additional rate can claim the difference through their tax return (the extra tax refund is not paid in the pension account).

The maximum amount of pension contributions that an individual can get tax relief on in each tax year is the highest of GBP 3 600, and 100% of the individual's taxable UK earnings. Where individuals UK taxable earnings are less than GBP 3 600, they can get relief on their contributions only if the pension scheme uses the relief at source method.

If an individual has pension contributions (from both member and employer) in a year of more than GBP 40 000 (annual allowance for the tax year 2017-2018) the excess is subject to a tax charge (the annual allowance charge) that effectively limits tax relief given for the year. Individuals are allowed to make use of unused annual allowance from the previous three years.

The money purchase annual allowance (MPAA) applies to individuals who have flexibly accessed pension benefits and who make money purchase pension contributions. If the MPAA has been triggered (by taking income from a flexi-access drawdown plan or an uncrystallised funds pension lump sum), only GBP 4 000 (the MPAA for tax year 2017-2018) can be paid to all DC plans for an individual in any tax year before the annual allowance tax charge is applied. If the MPAA is triggered part-way through a tax year, only the contributions made after the trigger are tested against the MPAA. However, the total contributions and accruals in that tax year are also tested against the GBP 40 000 annual allowance. The contributions paid before or on the trigger date are measured against an alternative annual allowance of GBP 36 000 (GBP 40 000 - GBP 4 000). Those paid after the trigger date are measured against the GBP 4 000 MPAA. It is not possible to carry forward unused tax relief against the MPAA. Contributions and accruals in relation to a defined benefit plan made after the trigger date are tested against the alternative annual allowance.

Pensions tax relief is restricted by a tapered reduction in the amount of the annual allowance for individuals with income (including the value of any pension contributions) over GBP 150 000 and who have an income (excluding pension contributions) in excess of GBP 110 000. The rate of reduction in the annual allowance is by GBP 1 for every GBP 2 that the adjusted income exceeds GBP 150 000, up to a maximum reduction of GBP 30 000. Where an individual is subject to the money purchase annual allowance, the alternative annual allowance is reduced by GBP 1 for every GBP 2 by which their income exceeds GBP 150 000, subject to a maximum reduction of GBP 36 000.

Although contributions can be paid after a member has reached the age of 75, they are not relievable pension contributions and do not qualify for tax relief.

Tax treatment of returns on investments

The income and gains from most pension scheme investments are not taxable. However, pension schemes do not receive a dividend tax allowance and income from certain investments, such as residential property, is taxable if the scheme is an investment-regulated pension scheme (i.e. a pension scheme where the investments can be directed by a member of the scheme).

Tax treatment of funds accumulated

There is a cap on the total amount that can be accumulated in a private pension plan that an individual can get tax relief on (lifetime allowance). This is currently set at GBP 1.03 million (updated annually by the consumer price index). Individuals building up pension savings worth more than the lifetime allowance will pay a tax charge on the excess.

Pension savings are tested against the lifetime allowance when individuals take their pension benefits and on certain other key events:

- Defined benefit schemes: pension benefits are tested against the lifetime allowance. This level of pension savings is broadly equivalent to an annual pension of GBP 50 000 if the individual does not take a lump sum, or GBP 37 500 if the individual takes the 25% maximum tax-free lump sum.
- Defined contribution schemes: the value of the pension pot that is used to pay pension benefits is tested against the lifetime allowance.

The charge is paid on any excess over the lifetime allowance limit. The rate depends on how this excess is paid to the individual. If the amount over the lifetime allowance is paid as a lump sum, the rate is 55%. If it is paid as a pension, the rate is 25% (the pension income is then taxed at the individual's marginal tax rate). The scheme administrator should deduct the lifetime allowance charge due from the pension pot before paying the pension.

Tax treatment of pension income

Annuities, programmed withdrawals and lump sums are all taxed as income at the marginal rate of income tax. Income from workplace and personal pension schemes is paid to the individual by the pension or annuity provider with tax already taken off via the PAYE (Pay As You Earn) system.

An individual can have a tax-free lump sum up to 25% of the total value of the pension pot(s) when they take a pension or annuity. DB schemes are deemed to have a pot size 20 times the annual pension to calculate the tax-free lump sum. Where DC schemes pay an uncrystallised funds pension lump sum, 75% of the value of the lump sum is taxable at the individual's marginal tax rate.

Pension savings accessed before the normal minimum pension age (currently age 55) are charged a 55% rate (unauthorised payments charge and unauthorised payments surcharge).

Non-tax incentives

No such incentives.

Social treatment

There is no National Insurance contributions' (NICs) relief on employee contributions. Employer contributions are excluded from earnings for both employer and employee NICs.

NICs are not levied on pension income.

Tax treatment of pensioners

The State Pension is taxed as income at the marginal rate of income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions to a registered pension scheme can be deducted as an expense in computing the profits of a trade, profession or investment business, and so reducing the amount of an employer's taxable profit. There is no set limit on the amount that an employer can pay into a registered pension scheme.

United States

Structure of the funded private pension system



Tax treatment of contributions

There are different types of employee and employer contribution with different tax treatments. Employee contributions can be salary reduction/elective deferral contributions, catch-up contributions, designated Roth contributions or after-tax contributions. This document describes the federal income tax rules that apply to these types of contribution. These contributions are also subject to state income tax rules; the state income tax rules are generally the same as the federal rules, but there are some differences in some states.

Salary reduction/elective deferral contributions

Salary reduction/elective deferral contributions are pre-tax employee contributions to occupational pension plans. There is an annual limit on elective deferrals made to all plans in which the individual participates. If the employee's total contributions exceed the deferral limit, the difference is included in the employee's gross income (i.e. the excess contribution is taxed at the individual's marginal rate of income tax). In addition, the excess amount (and the income earned on that amount) has to be withdrawn from the plan.

- If the excess contributions are withdrawn by April 15 of the following year, any income earned on the contribution is reported as gross income for the tax year in which it is withdrawn. The withdrawal is not subject to the additional 10% tax on early withdrawals.

- If the excess contributions are not withdrawn by April 15, they are subject to double taxation, i.e., they are taxed both in the year contributed and in the year withdrawn from the plan (at the individual's marginal rate of income tax). These withdrawals could also be subject to the 10% early withdrawal tax.

Limit on elective deferral contributions depend on the type of plan:

- Traditional 401(k), safe harbour 401(k), 403(b) and 457(b) plans: USD 18 500 in 2018.
- Savings Incentive Match Plan for Employees (SIMPLE) 401(k) and SIMPLE IRA plans: USD 12 500 in 2018.
- Salary Reduction Simplified Employee Pension (SARSEP): USD 18 500 in 2018 or 25% of compensation whichever is less.

The total amount the individual can contribute (elective deferral contributions and designated Roth contributions) to all his/her plans (not including 457(b) plans) is USD 18 500 in 2018.

Catch-up contributions

Certain plans allow participants 50 years old and over to make pre-tax catch-up contributions beyond the basic limit on elective deferrals. Different limits apply to these additional elective deferral contributions:

- Traditional 401(k), safe harbour 401(k), 403(b), SARSEP and 457(b) plans: USD 6 000 in 2018.
- SIMPLE 401(k) and SIMPLE IRA plans: USD 3 000 in 2018.
- Individual Retirement Arrangement (IRA) plans: USD 1 000 in 2018.
- 403(b) plans: If permitted by the 403(b) plan, an employee who has at least 15 years of service with a public school system, hospital, home health service agency, health and welfare service agency, church, or convention or association of churches (or associated organisation), has a 403(b) elective deferral limit that is increased by the lesser of USD 3 000; USD 15 000 reduced by the amount of additional elective deferrals made in prior years because of this rule; or USD 5 000 times the number of the employee's years of service for the organisation, minus the total elective deferrals made for earlier years. When both the age-50 catch-up and the 15-year catch-up are available, the 15-year catch-up contributions apply first and count towards the overall limit on contributions, while the age-50 catch-up contributions extend this overall limit.
- 457(b) plans: special 457(b) catch-up contributions, if permitted by the plan, allow a participant for 3 years before the normal retirement age (as specified in the plan) to contribute the lesser of twice the annual limit (USD 37 000 in 2018); or the basic annual limit plus the amount of the basic limit not used in prior years (only allowed if not using age-50 catch-up contributions).

If an individual aged 50 or over participates in only one 401(k) plan that does not permit catch-up contributions, the USD 18 500 limit applies. However, if that individual participates in two 401(k) plans, s/he can contribute up to USD 24 500 (18 500 + 6 000) on aggregate even though neither plan has catch-up provisions. The USD 18 500 limit still applies to each plan.

Designated Roth contributions and after-tax contributions

Designated Roth contributions are included in gross income (but tax free when withdrawn if certain requirements are met) and are therefore taxed at the individual's marginal rate of income tax. Roth contributions can be made to Roth Individual Retirement Accounts (Roth IRAs) and to 401(k), 403(b) and governmental 457(b) plans.

After-tax contributions are contributions from compensation that an employee includes in taxable income. After-tax contributions can be made to traditional IRAs and to other types of pension plans that permit these types of contribution.

IRA contribution limits

In addition to the contribution limits described above, limits apply to contributions to Roth and traditional IRAs. Contributions that exceed these limits are excess contributions. Excess contributions are taxed at 6% per year, as long as the excess amounts remain in the IRA. The excess contribution can be avoided by withdrawing the excess contribution and any income earned on it by the due date of the individual income tax return.

The maximum an individual can contribute to all of his/her IRA plans is the lesser of USD 5 500 (USD 6 500 including catch-up contributions); or the individual's taxable compensation for the year. Although the same overall limit applies to both Roth and traditional IRAs, Roth IRA contributions may be limited based on the participant's filing status and income (see Table A A.12).

Table A A.12. United States: Amount of Roth contributions allowed for 2018

Filing status	Modified adjusted gross income	Contribution limit
Married filing jointly/ Qualifying widow(er)	< USD 189 000	Up to the limit
	= USD 189 000 and < USD 199 000	A reduced amount
	= USD 199 000	zero
Married filing separately and the participant lived with his/her spouse at any time during the year	< USD 10 000	A reduced amount
	= USD 10 000	zero
Single/Head of household/Married filing separately and the participant did not live with his/her spouse at any time during the year	< USD 120 000	Up to the limit
	= USD 120 000 and < USD 135 000	A reduced amount
	= USD 135 000	zero

Note: Calculation method to calculate the reduced amount: <https://www.irs.gov/retirement-plans/plan-participant-employee/amount-of-roth-ira-contributions-that-you-can-make-for-2018>.

Contributions to a traditional IRA are made after-tax but may be deductible. The deduction may not be full if the participant or his/her spouse is covered by an occupational pension plan and his/her income is above certain limits, as described below (see Table A A.13 and Table A A.14).

Table A A.13. United States: Deduction limits for traditional IRA contributions if the participant is covered by an occupational pension plan (2018)

Filing status	Modified adjusted gross income	Deduction limit
Single/Head of Household	= USD 63 000	Full deduction up to the amount of the member's contribution limit
	> USD 63 000 and < USD 73 000	Partial deduction
	= USD 73 000	No deduction
Married filing jointly/Qualifying widow(er)	= USD 101 000	Full deduction up to the amount of the member's contribution limit
	> USD 101 000 and < USD 121 000	Partial deduction
	= USD 121 000	No deduction
Married filing separately	< USD 10 000	Partial deduction
	= USD 10 000	No deduction

Table A A.14. United States: Deduction limits for traditional IRA contributions if the participant is not covered by an occupational pension plan (2018)

Filing Status	Modified adjusted gross income	Deduction limit
Single/Head of Household/qualifying widow(er)	Any amount	Full deduction up to the amount of the member's contribution limit
Married filing jointly or separately with a spouse who is not covered by an occupational pension plan	Any amount	Full deduction up to the amount of the member's contribution limit
Married filing jointly with a spouse who is covered by an occupational pension plan	= USD 189 000	Full deduction up to the amount of the members contribution limit
	> USD 189 000 and < USD 199 000	Partial deduction
	=USD 199 000	No deduction
Married filing separately with a spouse who is covered by an occupational pension plan	< USD 10 000	Partial deduction
	= USD 10 000	No deduction

Deductible contributions to a traditional IRA are not allowed in the year an individual reaches 70½ or later years. However, an individual can make contributions to a Roth IRA, and can make rollover contributions to a Roth or traditional IRA, regardless of age.

Employer contributions

Employers can make matching contributions or discretionary/non-elective contributions. In both cases, employer contributions are not included in the individual's gross income. There are limits to how much employers and employees can contribute on aggregate to each plan each year. The limits differ depending on the type of plan.

Overall limit on contributions

- Defined contribution plans (including 401(k) plans): total annual contributions to all the accounts of an individual in plans maintained by one employer (and any related employer) are limited. Total annual contributions cannot exceed the lesser of 100% of the participant's compensation; or USD 55 000 (USD 61 000 including catch-up contributions) in 2018. The limit applies to the total of all types of contribution, including elective deferrals, employer matching contributions, employer non-elective contributions and allocations of forfeitures.
- SIMPLE 401(k) plans: smaller limits apply.

- 403(b) plans: the limit on the combination of all employer contributions and employee elective deferrals to all 403(b) accounts is the lesser of USD 55 000 (USD 61 000 including catch-up contributions) or 100% of the amount of taxable wages and benefits the employee received in his/her most recent full year of service.
- 457(b): annual contributions cannot exceed the lesser of 100% of the participant's compensation; or the elective deferral limit (USD 18 500 in 2018, USD 24 500 including catch-up contributions).
- Simplified Employee Pension Plans (SEP): contributions an employer can make to an employee's SEP-IRA cannot exceed the lesser of 25% of the employee's compensation; or USD 55 000 in 2018. Elective deferrals and catch-up contributions are not allowed in SEP plans.
- SIMPLE IRA plans: elective deferrals are limited to USD 12 500 in 2018 (USD 18 500 including catch-up contributions). Employer contributions are limited to either (1) a dollar-for-dollar match of employee contributions up to 3% of the employee's compensation; or (2) a non-elective contribution of 2% of each eligible employee's compensation.

Savers' Credit

Individuals may receive a non-refundable tax credit for making eligible contributions to an IRA (traditional or Roth) or occupational pension plan (401(k), SIMPLE IRA, SARSEP, 403(b) or 457(b)). The amount of the credit (so-called Saver's Credit) is 50%, 20% or 10% of the contribution up to USD 2 000 (USD 4 000 if married filing jointly), depending on the individual's adjusted gross income (AGI).

Table A A.15. United States: Saver's Credit (2018)

Credit rate	Married filing jointly	Head of household	All other filers
50% of contribution	AGI = USD 38 000	AGI = USD 28 500	AGI = USD 19 000
20% of contribution	USD 38 001 – USD 41 000	USD 28 501 – USD 30 750	USD 19 001 – USD 20 500
10% of contribution	USD 41 001 – USD 63 000	USD 30 751 – USD 47 250	USD 20 501 – USD 31 500
0% of contribution	> USD 63 000	> USD 47 250	> USD 31 500

Note: All other filers include: single, married filing separately or qualifying widow(er).

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Withdrawals from pension plans must be included in taxable income (and therefore taxed at the individual's marginal rate of income tax), except for designated Roth accounts.

Individuals must pay an additional 10% early withdrawal tax if the withdrawal occurs before the individual reaches 59½ years old.²³

Most payments an individual receives from a pension plan (other than annuity payments) can be “rolled over” by depositing the payment in another pension plan within 60 days. By rolling over a pension plan benefit, the individual does not pay tax on amounts that are rolled over until they are withdrawn from the new plan.

Once reaching age 70½, the individual generally must withdraw a minimum amount (so-called Required Minimum Distribution, RMD) from his/her pension plan each year. It is possible to withdraw more than the RMD. If the individual fails to take the full amount of an RMD, the individual generally will have to pay a 50% excise tax on the amount not withdrawn as required. Under the RMD strategy, the percentage of financial assets that retirees can withdraw each year increases as they age, from 3.13% at 65 to 4.37% at 75, 6.76% at 85, and 15.78% at 100.

Roth IRAs do not require withdrawals until after the death of the owner. In a Roth IRA, a retiree can withdraw money, including the investment income, totally tax free if s/he has had the Roth IRA for more than five years.

Non-tax incentives

Employers are permitted to automatically enrol employees into a 401(k) plan and to automatically escalate elective deferral/salary reduction contributions. For a Qualified Automatic Contribution Arrangement, the initial automatic employee contribution must be at least 3% of wages, increasing by 1 percentage point annually, so that by the fourth year, the automatic elective deferral/salary reduction contribution is at least 6% of wages. Under this arrangement, the employer must match 100% of the first 1% of wages contributed by the worker, plus 50% of the next 5% of wages, for a maximum match of 3.5% of wages to each employee. Alternatively, the employer can make a non-elective contribution of at least 3% of wages to all eligible non-highly compensated employees.

Employees covered by the Federal Employees Retirement System (FERS) and members of the uniformed services covered by the Blended Retirement System (BRS) can participate in the Thrift Savings Plan (TSP) and receive matching contributions from their agency or service on the first 5% of pay they contribute every pay period. The first 3% is matched dollar-for-dollar, while the next 2% is matched at 50 cents on the dollar.²⁴

Social treatment

There is no social contributions relief on salary reduction/elective deferral contributions. Social contributions include social security tax (6.2% of taxable earnings for the employer and 6.2% for the employee), Medicare tax (1.45% for the employer and 1.45% for the employee) and Additional Medicare tax (0.9% of wages in excess of USD 200 000 for the employee). Other employer contributions are not subject to social security and Medicare tax.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Social security benefits include monthly retirement, survivor and disability benefits. They do not include supplemental security income (SSI) payments, which are not taxable. To determine whether social security benefits are taxable, the individual must compare the base amount for his/her filing status with the total of one-half of his/her benefits, plus all his/her other income, including tax-exempt interest. If the total is more than the base amount, part of the benefits is taxable. The base amounts for 2018 are the following:

- USD 25 000 for single, head of household or qualifying widow(er);
- USD 25 000 for married individuals filing separately and lived apart for all of the year;
- USD 32 000 for married couples filing jointly;
- USD 0 for married couples filing separately and living together at any time during the year.

Generally, up to 50% of the social security benefits are taxable. However, up to 85% of the benefits can be taxable if either of the following situations applies to the individual:

- The total of one-half of benefits and all other income is more than USD 34 000 (USD 44 000 if married filing jointly);
- The individual is married filing separately and living with his/her spouse at any time during the year.

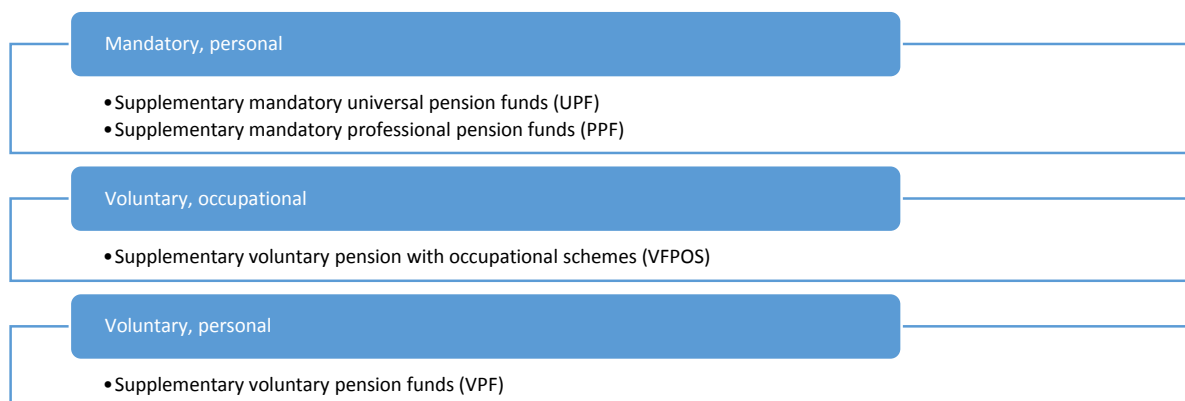
Incentives for employers to set up or contribute to a funded private pension plan

Although employers generally cannot deduct amounts provided to an employee until the year in which those amounts are included in the employee's income, employers can deduct amounts contributed to pension plans (including elective deferral/salary reduction contributions, which are treated as employer contributions for this purpose) in the year that they are contributed to the pension plan.

The income tax deferral provided by pension plans is a particularly desirable benefit for highly compensate employees, including the working owners of smaller businesses and the executives of larger companies. Non-discrimination rules prohibit employers from providing significantly greater pension plan benefits to highly compensated employees than they provide to employees who are not highly compensated (referred to as non-highly compensated employees). However, the non-discrimination rules allow employers to provide somewhat better benefits to highly compensated employees than they provide to non-highly compensated employees. Limiting the ability of employers to provide pension benefits to highly compensated employees by the amount that they provide to non-highly compensated employees is intended to give working employee, owners and executives an incentive to establish, and make contributions to, pension plans for all employees.

Bulgaria

Structure of the funded private pension system



Tax treatment of contributions

Employee contributions into UPF and PPF are tax deductible. Employer contributions into UPF and PPF are not included in the employee's taxable income.

Employee contributions into VPF and VPFOS are tax deductible up to 10% of the individual's taxable income. Excess contributions are taxed for the individual (fixed income tax rate of 10%). Employer contributions are not included in the employee's taxable income up to BGN 60 per month (excess contributions are taxed for the employee).

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension income from UPF, PPF, VPF and VPFOS is tax exempt. Benefits from UPF and PPF are tax free in all cases. Benefits from VPF and VPFOS are tax free only after the person becomes eligible for a pension.

Individuals can withdraw annuities, programmed withdrawals, lump sums or a combination of them from VPF in case of retirement or disability. If the individual is not in retirement or in a disability scheme, s/he can also withdraw assets but the part of withdrawal corresponding to contributions, which enjoyed tax deduction, is taxed at the rate of 10%.

Non-tax incentives

No such incentives.

Social treatment

Both employee and employer contributions are not subject to obligatory social contributions.

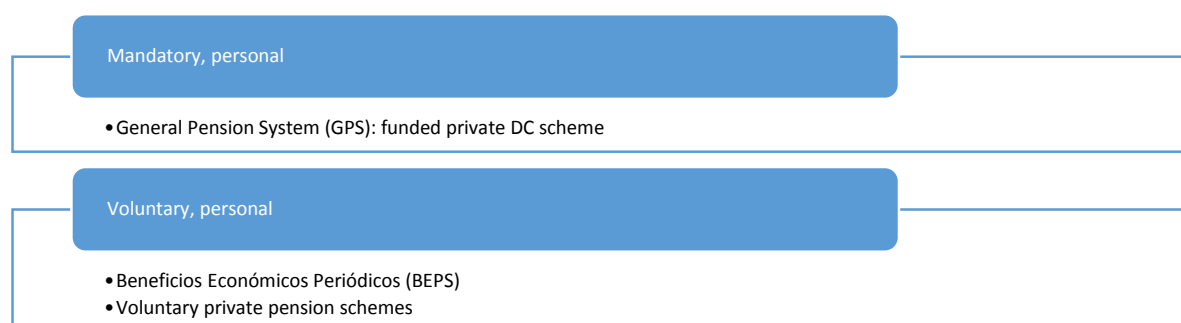
Pension income is exempt from social security contributions.

Tax treatment of pensioners

Pensions from the first pillar (public pay-as-you-go) are tax exempt.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into UPF, PPF, VPF and VPFOS are deductible from corporate income tax. For VPF and VPFOS, the tax relief is valid: i) for contributions not exceeding the amount of BGN 60 per month per employee and ii) if the employer does not incur any coercively enforceable public obligations.

Colombia***Structure of the funded private pension system***

The Global Pension System (GPS) is a mandatory system with two competing schemes: (1) the public pension scheme and (2) the private pension scheme. Insured individuals must contribute to either the public or the private pension scheme and may switch membership every five years up to the last ten years before retirement.

Tax treatment of contributions

Mandatory contributions to the General Pension System paid by the employee and the employer are not considered as income for the employee and are therefore exempt from income tax.

Voluntary contributions made by the employee, the employer, or the independent worker are exempt from income tax provided these amounts, added to deposits into special savings accounts to support the purchase of housing (AFC), do not exceed 30% of the employee's employment income or COP 125 992 800 (3 800 UVT) annually.²⁵

In case these voluntary contributions are withdrawn by the affiliate within ten years, the withdrawn contributions are considered as taxable income in the year of withdrawal, except if this withdrawal is due to the affiliate's retirement, disability or death, or the withdrawal is made for home buying.

The sum of all exempt income and deductions cannot exceed 40% of gross income less health and pension contributions up to 5 040 UVT, i.e. COP 167 106 240, for fiscal year 2018.

Tax treatment of returns on investments

The investment returns on pension fund assets are exempt from income tax.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

The sum of mandatory (public or private) and voluntary pension benefits is exempt from income tax unless the aggregate monthly benefits are over 1 000 UVT.

Non-tax incentives

The *Beneficios Económicos Periódicos* (BEPS) programme allows some of the lowest income groups to voluntarily contribute to GPS, as long as they are affiliated to either the private or the public component of the GPS. At retirement, individuals receive a 20% matching contribution from the government. The government matching contribution is only deposited in the pension account when the individual retires and therefore does not accrue interests during the accumulation phase.

For the public component of the GPS, individuals eligible for the BEPS programme are those who could not complete all the weeks required to become beneficiaries of a pension income and have reached the age of retirement, or those who cannot contribute on the basis of a minimum salary.

For the private DC component of the GPS, members who cannot accumulate the minimum capital to become eligible for the minimum pension guarantee are eligible for the BEPS programme.

Social treatment

Contributions to private pension funds come from a base salary and are therefore subject to social contributions.

Private pension income is subject to health care contributions. A rate of 12% is applied to pension benefits to contribute to the health care system, which is lower than the rate applied when the member is an employee (12.5%, of which 8.5% is paid by the employer). However, this 12% must be fully paid by the member.

Tax treatment of pensioners

The sum of mandatory (public or private) and voluntary pension benefits is exempt from income tax unless the aggregate monthly benefits are over 1 000 UVT.

Incentives for employers to set up or contribute to a funded private pension plan

Pension contributions made by an employer are tax exempt from its gross corporate income tax.

Croatia

Structure of the funded private pension system



Tax treatment of contributions

Contributions into open mandatory pension funds (5% of wages) are tax exempt. The maximum monthly earnings considered to compute contributions are HRK 48 120.

Employee contributions into open and closed voluntary pension funds are taxed at the marginal rate of income tax and matched by the government.

Employer contributions into closed voluntary pension funds are not considered as employee's taxable income up to HRK 6 000 a year. The same limit applies to self-employed individuals saving for themselves. Excess contributions are considered as employee's taxable income.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Income from open mandatory pension funds is taxable. Pensioners only pay 50% of the tax that would be due if that income was taxed as income from employment at the marginal rate of income tax.

Individuals can claim annuities from open mandatory pension funds if they are eligible to get a retirement pension from the public pension scheme. It is not possible to withdraw lump sums or programmed withdrawals from open mandatory pension funds. Early withdrawal is not possible.

Income from open and closed voluntary pension funds is tax exempt. Individuals can withdraw lump sums, programmed withdrawals, annuities or combinations of them from their open and closed voluntary pension funds if they are 50 years old or more.

Non-tax incentives

Member's contributions into open and closed voluntary pension funds are matched by the government. The government matches 15% of the member's first HRK 5 000 of contributions (for a maximum matching contribution of HRK 750 per year). Contributions above HRK 5 000 a year are not matched.

Social treatment

Contributions into open mandatory pension funds are part of the social contributions levied on employee's earnings.

As of 1 January 2015, employers who conclude an employment contract for an indefinite period with a person younger than 30 years of age will be exempt from employer's social contributions (that is, health insurance contribution, unemployment contribution and contribution for work related injuries – currently cumulatively 17.2%) for a period of 5 years from employing such a person. Therefore, only employee contributions will be payable (i.e. pension insurance contributions pillar I and pillar II).

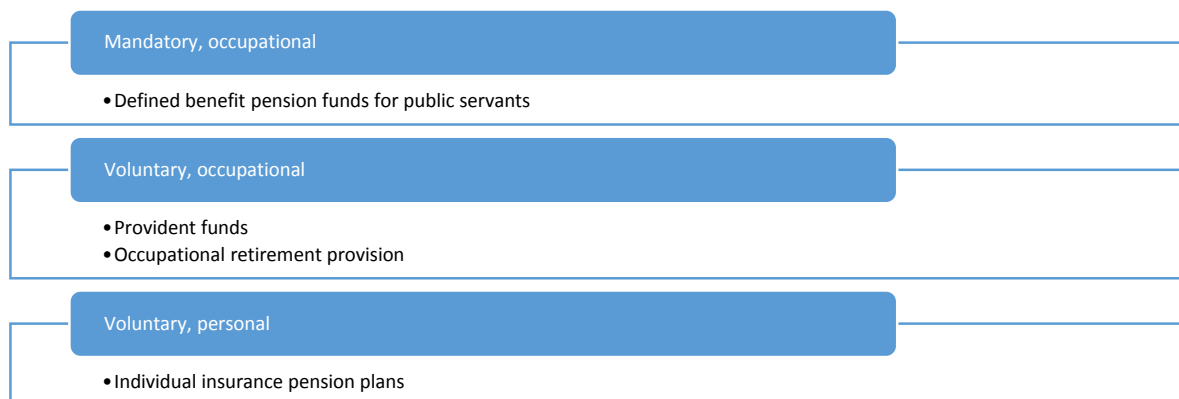
No social contributions are levied on private pension income.

Tax treatment of pensioners

Public pension income is taxed at the marginal rate of income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into closed voluntary pension funds are not subject to corporate tax up to HRK 6 000 a year.

Cyprus***Structure of the funded private pension system******Tax treatment of contributions***

Employee contributions into occupational defined benefit pension funds for public servants and into provident funds are tax deductible up to one sixth of the employee's annual taxable income. This cap applies to the sum of tax-deductible contributions paid for defined benefit pension funds for public servants, provident funds, medical funds (up

to 1.5% of employee's income), social insurance, and life insurance (up to 7% of the insured amount). Excess contributions are taxed at the marginal rate of income tax.

Tax treatment of returns on investments

Returns on investments are not subject to income tax.

Interest income earned by provident funds is taxed at the flat rate of 3% (special contribution for defence).

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Pension benefits paid by provident funds only take the form of tax-free lump sums.

Non-tax incentives

No such incentives.

Social treatment

Contributions to private pension plans are subject to social contributions.

Social contributions are not levied on pension income.

Tax treatment of pensioners

Pension income from public pension schemes is taxed at the marginal rate of income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into occupational defined benefit pension funds for public servants and into provident funds are tax deductible from corporate tax.

Malta

Structure of the funded private pension system



Tax treatment of contributions

Employees who contribute into voluntary occupational and personal retirement schemes receive a non-refundable tax credit equal to 15% of the member's contribution up to a maximum of EUR 150 a year.

Employer contributions into voluntary occupational retirement schemes are not considered as taxable income for the employee.

Employers can contribute into personal retirement schemes but receive no tax credit on their contributions and the contributions are considered as employee's taxable income.

Tax treatment of returns on investments

Returns on investments (i.e. interests, dividends and capital gains) of any retirement fund or retirement scheme licensed, registered or otherwise authorized under the Special Funds (Regulation) Act or any Act replacing the said Act are tax exempt, except income derived from immovable property situated in Malta.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

Lump sums are tax free up to 30% of the accumulated assets. Above they are taxed at the marginal rate of income tax.

Other payment options are taxed at the marginal rate of income tax.

Non-tax incentives

No such incentives.

Social treatment

The social security contributions are calculated on the gross pay.

No social security contributions are deducted from the pension income.

Tax treatment of pensioners

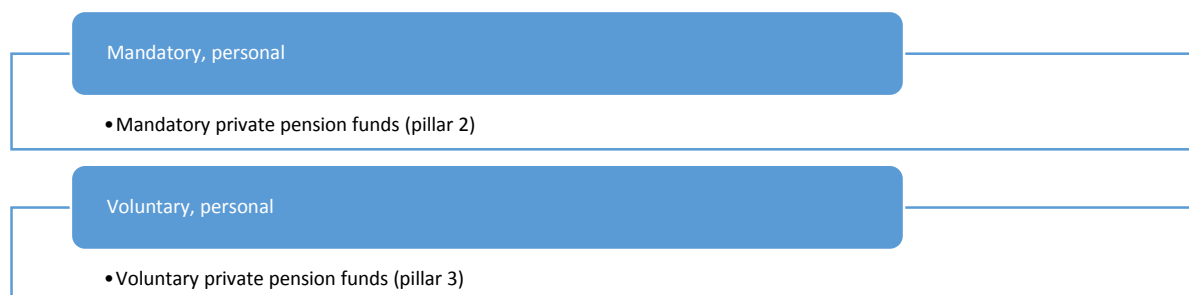
Pension income from public pension schemes is taxed at the marginal rate of income tax.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into voluntary occupational retirement schemes are deductible from corporate income tax up to a maximum of EUR 2 000 per employee per year. In addition, employers receive a non-refundable tax credit amounting to the lower of 15% of the amount of contributions paid or EUR 150 for each employee in respect of whom the contributions are paid.

Romania

Structure of the funded private pension system



Second pillar private pension funds are mandatory for employees and self-employed persons up to 35 years old and voluntary between 35 and 45 years old.

Tax treatment of contributions

Contributions into mandatory private pension plans are tax deductible. They are 3.75% of gross earnings in 2018.

Employee and employer contributions into voluntary private pension plans are commonly capped at 15% of the employee's gross earnings. Employer contributions are not considered as employee's taxable income. Employee contributions are tax deductible up to EUR 400. Excess contributions are taxed at the fixed income tax rate of 10%.

Tax treatment of returns on investments

Returns on investments are not taxed.

Tax treatment of funds accumulated

There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated.

Tax treatment of pension income

There is no pay-out legislation yet. However the secondary legislation has been amended in order to allow members to receive their accumulated account in monthly instalments up to 5 years starting April 2018.

Pension income below RON 2 000 per month is tax free. This limit is common with public pensions. Pension income above this threshold is taxed at the fixed income tax rate of 10%.

Non-tax incentives

No such incentives.

Social treatment

Contributions into mandatory private pension plans are part of the social contributions levied on employee's earnings.

Employee and employer contributions into voluntary private pension plans are not subject to social contributions.

No social contributions are levied on pension income.

Tax treatment of pensioners

Pension income (public and private) is tax exempt up to RON 2 000 per month, above it is taxed at the fixed income tax rate of 10%.

Incentives for employers to set up or contribute to a funded private pension plan

Employer contributions into voluntary private pension plans are tax deductible up to EUR 400 from corporate tax.

Notes

¹ This description applies to the majority of pension funds. Some funds do not pay taxes on concessional contributions nor on returns on investment, but withdrawals from these funds are taxed.

² Salary sacrifice contributions are when the employee and the employer make a valid agreement to pay some of future before-tax salary or wages into the employee's superannuation fund.

³ People can only make non-concessional contributions to their spouse's account if their spouse is younger than 65 or aged 65–70 and working. No tax offset is available when the spouse receiving the contribution has exceeded their non-concessional contributions cap or their balance is AUD 1.6 million or more.

⁴ Rebate income is the aggregate of taxable income, adjusted fringe benefits amounts, total net investment loss and reportable superannuation contributions.

⁵ As municipal tax is levied on total income tax, the tax credit also reduces the taxable base for municipal tax.

⁶ Employers can offer individual company plans to specific employees, if they already offer a collective plan to all their employees. In that case, employer contributions cannot exceed EUR 1 525 in 2018 (EUR 2 440 in 2019). These arrangements are rare.

⁷ The employer must however pay an additional 4.4% contribution for the solidarity components.

⁸ The UF (*Unidad de Fomento*) is a price-indexed unit of account.

⁹ The UTM is a Monthly Taxation Unit.

¹⁰ It is not possible to withdraw a lump sum before the age of 60. Early withdrawal is possible as an annuity or programmed withdrawal up to 5 years before the official retirement age.

¹¹ The retirement age is 60 for members affiliated between 06/05/2004 and 31/12/2012, and 55 for members affiliated before 06/05/2004.

¹² There is a debate on how to classify the CSG. The French Law considers it as a tax because it does not entitle workers to any right or benefit (as opposed to social contributions). The Court of Justice of the European Union considers it as a social contribution because the money is only used to finance the social security system and is levied on wages (although not only). Following French interpretation, both CSG and CRDS are considered as taxes in this analysis, rather than as social contributions.

¹³ The tax authority checks whether individuals are entitled to the tax deduction. The tax authority first deducts the capped gross contributions (i.e. own contributions plus the subsidy, up to EUR 2 100) from the personal income tax base and calculates an adjusted tax liability. It then adds the amount of the subsidy to the adjusted tax liability and compares it with the regular tax liability (i.e. without deducting contributions). The tax relief corresponds to the difference between the two tax liabilities. If the difference is negative, the tax authority does not deduct contributions.

¹⁴ For contracts signed before 2011, the minimum age to receive payments is 60.

¹⁵ The tax credit rates include local income tax.

¹⁶ The rules described here correspond to those that will apply fully from 2020. There is a transition from the old rules to the new rules between 2016 and 2019, with the portion of the tax calculated based on the new rules increasing over time.

¹⁷ The Wage Claim Guarantee Act of Korea (WCGAK) guarantees payment of employees' wage claims covered as preferential claims in the insolvency process.

¹⁸ In July 2018, the Parliament of Lithuania approved significant tax reforms that will take effect in 2019. In particular, the reform plans a shift from a fixed 15% personal income tax rate to a progressive income tax system.

¹⁹ The general deduction limit also applies to other expenses such as hospital and medical expenses, funeral expenses and mortgage real interests.

²⁰ Individuals whose only taxable income is composed of interest income can consider the withholding tax as their final tax payment as long as these interests do not exceed MXN 100 000 per year.

²¹ G is the basic amount and is worth NOK 95 800 in 2018.

²² This percentage is obtained by applying 24% on the employer and employee contributions into the public pension scheme: $0.24 \times 0.2435 = 5.844\%$.

²³ Exceptions are listed here: <https://www.irs.gov/retirement-plans/plan-participant-employee/retirement-topics-tax-on-early-distributions>.

²⁴ The agency or service also pays automatic contributions equal to 1% of basic pay for FERS and BRS participants. Participants do not have to contribute any money to their TSP account to receive these contributions.

²⁵ The value of each tax unit (*Unidad de Valor Tributario* or UVT) is equivalent to COP 33 156 for fiscal year 2018.

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