Abstract

As part of globalization, individuals increasingly spend part of their working or retirement life abroad and want to keep or move their acquired rights, accumulated retirement assets, or benefits in payment freely across borders. This raises the issue of the portability and taxation of cross-border pensions in accumulation and disbursement. This paper addresses both portability and taxation issues from the angle of which type of pension scheme – defined benefits (DB) or defined contributions (DC) – and which regime of cross border pension taxation is more aligned with globalization in establishing individual fairness, fiscal fairness, and bureaucratic efficiency. The paper summarizes the limited literature on portability and taxation of cross-border pensions and concludes that the current taxation approach is unsustainable in a global setting. We present a proposal to move from deferred toward frontloaded taxation of pensions and point at the gains in fairness for individuals and states and some other attractive features of this regime change. Moreover, we discuss three tax payment options for frontloaded pension taxation which can be combined with financial and nonfinancial pension schemes.

Keywords: portability of pensions, pension taxation, international taxation, international migration, model tax convention

JEL Classification: H55, H24, H87, F22
1 Introduction

Pensions and broader forms of retirement income do not stop at national borders. As part of globalization and the increasing mobility of labor and capital, an increasing number of individuals spend at least part of their working life abroad and acquire pension rights that they want to keep in case of migration. Some individuals want to spend part or all of their retirement life in places with a better climate, a lower cost of living, or a more benign taxation of their retirement income. However, the increasing mobility of individuals before and after retirement raises questions of the portability of pension claims and their taxation along the pension cycle. Both topics, portability and taxation of pensions, have found limited attention in pension economics so far.

Simply put, full portability of pensions allows labor migrants to accumulate and maintain pension rights and to receive pension benefits after retirement anywhere in the world. Without that ability, potential migrants may decide not to migrate, or to migrate although they risk losing their acquired rights. In the first case, international labor mobility is impeded; in the second, costly risk management reduces the welfare of the migrant over his lifecycle. Such obstacles may also arise even if pension benefits are portable but other benefits, particularly in health care, are not.

The income taxation of cross-border pensions may increase or reduce individuals’ migration incentives, as the total tax burden of the retired migrant may rise or fall depending on the income taxation in working and residence countries. For the relevant tax burden of the migrant’s pension, the tax treatment across his whole lifecycle matters as income taxes may be levied when contributions are paid, when pension wealth earns returns, and when pension benefits are paid.

Differences in the portability of social benefits and in the taxation of cross-border pensions raise questions of individual fairness, e.g., do I get out what I paid in?, or is my pension tax burden the same as that of a nonmigrating individual? Portability also affects fiscal fairness at the country level, i.e., does the portability arrangement and the tax assignment in the double taxation treaty favor one country affected by migration? A final issue concerns the bureaucratic efficiency of the implemented portability and taxation system with respect to administration and compliance.

This paper addresses both portability and taxation issues by comparing different types of pension schemes with respect to individual fairness, fiscal fairness, and bureaucratic efficiency in a global setting. The focus is on the pension type – defined benefits (DB) versus defined contributions (DC) – with funding and administrative issues given secondary importance. The relevant literature on both topics is briefly summarized and referenced. Section 2 presents evidence on rising international labor mobility and retirement migration. Section 3 discusses portability issues and the role of benefit types. Section 4 surveys the complexity of pension taxation within and across countries, identifies a double fairness dilemma due to the interaction of deferred pension taxation and the tax assignment in the OECD Model Tax Convention, and proposes front-loaded pension taxation as a fair and sustainable tax regime. Section 5 discusses the reform proposal and the implementation of the income tax payment options under different types of pension schemes. Section 6 summarizes and concludes.
The rise of international labor and benefit mobility

Figure 1 illustrates the dynamics of the worldwide migration since 1960. The share of individuals living outside their home country reached 3.4 percent (260 millions) of the world population in 2017 up from 2.3 percent during the temporary low in the 1970s. In 2018, the number of people living in the EU-28 who were citizens of other (EU member and nonmember) countries was 39.9 millions, representing 7.8 percent of the EU-28 population, while the number of people living in the EU-28 who were born outside of the European Union (EU) was 60.0 millions or 11.7%. (Eurostat 2019).

Figure 1: Number and share of migrants in world population, 1960–2017

Source: United Nations 2017; Migration Policy Institute, Data Hub; authors’ compilation.

The migrant stock numbers of Figure underestimate the underlying labor mobility dynamics, because the numbers only capture individuals who have lived outside their traditional country of residence in the observation year. As individuals may take multiple migration spells of varying length, sometimes in different countries, the relevant number of individuals with past migration spells is significantly higher. Evidence from across the world is strong that the number of spells spent abroad is increasing. The EU figures show a similar rising trend. The level of potential cross-border pension recipients cannot be indicated by adding foreign born and noncitizen figures due to double counting, but even its exclusion would underestimate cross-border pension claims by neglecting individuals who spent at least some of their adult life outside their home country (as a student, intern, intra- or interfirm mobile employee, labor migrant, or “snowbird” retiree). Holzmann (2015) estimates that one out of every five migrants within and to the EU has earned cross-border pension claims. Table 1 details the composition and trends of former labor and more recent retirement mobility to and from Germany. The share of recipients of German pension benefits outside Germany plus the number foreign born pensioners, who live in Germany and are likely to have cross-border pension claims as well, was 11.1 percent in 2015, up from 9.8 percent 10 years before.
Table 1: Recipients of statutory German pensions – in Germany and abroad

<table>
<thead>
<tr>
<th>Number of pensioners in millions (in % of total pensioners)</th>
<th>2015</th>
<th>2010</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pensioners with non-German citizenship</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- living in Germany</td>
<td>2.612 (100%)</td>
<td>2.367 (100%)</td>
<td>2.032 (100%)</td>
</tr>
<tr>
<td>- living outside Germany</td>
<td>1.099 (42.1%)</td>
<td>0.944 (39.9%)</td>
<td>0.774 (38.1%)</td>
</tr>
<tr>
<td>Pensioners with German citizenship</td>
<td>1.512 (57.9%)</td>
<td>1.423 (60.1%)</td>
<td>1.258 (61.9%)</td>
</tr>
<tr>
<td>Total number of pensioners</td>
<td>25.520 (100%)</td>
<td>25.013 (100%)</td>
<td>22.484 (100%)</td>
</tr>
<tr>
<td>- living outside Germany</td>
<td>1.741 (6.85%)</td>
<td>1.629 (6.51%)</td>
<td>1.427 (5.83%)</td>
</tr>
<tr>
<td>- non-German citizens living in Germany</td>
<td>1.099 (4.21%)</td>
<td>0.944 (3.77%)</td>
<td>0.774 (3.44%)</td>
</tr>
<tr>
<td>- potential recipients of cross-border pensions</td>
<td>2.841 (11.1%)</td>
<td>2.573 (10.3%)</td>
<td>2.201 (9.8%)</td>
</tr>
</tbody>
</table>


Warnes (2009) presents data for Germany, the United Kingdom, and the United States on the popularity and dynamics of their respective retirement destinations for the period mid-1990s to 2005, which show a dynamic similar to that presented in Table 1.

3 Portability issues: Objectives, instruments, and DB–DC comparison

The topic of cross-border portability of pensions (and other social benefits) is a relatively new area in pension economics. While the portability of pension benefits within countries and between occupational plans has been explored for quite some time (e.g., Foster 1994), portability between countries has received little attention by economists. This field was generally left to experts of social policy and social law.

This paper focuses on the economic issues of portability, which might be captured by the following working definition:

“Cross-border portability of pension benefits is the ability of labor migrants to preserve, maintain, and transfer both acquired pension rights and rights in the process of being acquired from one private, occupational, or statutory pension schemes, to another independent of nationality and aligned with the country of residence. Pension rights refer, in principle, to all rights stemming from contributory payments or residence criteria in a country. Not portable typically are benefit components that are not based on contributions such as benefit top-ups for low-income individuals or minimum income guarantees.”

Section 3 presents the economic foundation of portability based on three elements: a brief discussion of the economic objectives of international portability of pensions and more broadly of social security benefits (section 3.1); a brief presentation of the key instruments used to establish pension benefit portability (section 3.2); and an assessment of the implications for the DB–DC selection (section 3.3).

3.1 Objectives of portability

Establishing portability of social benefits should be straightforward, as three key considerations—economic, social, and human rights—favor it (Holzmann and Koettl 2015).
From a first-best economic point of view, individuals’ labor mobility decisions should not be hampered by the lack of portability of social benefits for which they have acquired rights. Global efficiency and global growth is increased if distortionary obstacles toward portability are absent. To ensure that international labor mobility profits the home as well as the host country, select and appropriate bilateral interventions may be necessary.

The lack of benefit portability can influence labor migrants’ international mobility decisions. Workers may decide not to take a job abroad if they have to pay social security contributions in the host country but cannot profit from its benefit coverage or cannot take their acquired rights home. Nonportability is particularly relevant for the long-term benefits of pensions and health care schemes. For pensions, problems exist due to long vesting periods of 10, or 15, or even more years or to restrictions on cross-border benefit payments. Access to health care services in retirement is typically linked to the eligibility of pension benefits and residence in the host country, unless cross-country legal arrangements exist.

From a social policy point of view, such acquired rights are a critical element of individual and household lifecycle planning and social risk management. Denying portability – particularly once the mobility decision has been made and cannot be reversed – increases the risk of lifecycle planning for individuals and their families and creates substantial welfare losses.

For emigrants the lack of portability of acquired rights means that they have to establish pension rights in their home country. While a higher wage rate in the host country may provide some compensation, labor emigrants will face a lower replacement rate after retirement. This typically happens for mid-career labor migrants who will have to increase private saving or to continue working if they cannot transfer pension rights acquired abroad to their home county or receive cross-border benefits. These adjustments in lifecycle planning are beneficial, but they cause welfare losses compared to full portability.

From a human rights point of view, migrants have the right to enjoy social protection according to national legislation and international conventions. These rights should carry over when individuals leave the country or change profession. A key question is whether these human rights apply only to acquired (contributory or residential) pension rights or to all social rights. As they are resource-consuming, economic and human rights tradeoffs will emerge.

3.2 Instruments of portability

Essentially three approaches are available to establish cross-border portability of pension benefits between countries:

- Stipulating binding portability arrangements between countries
- Using multinational private pension providers
- Changing the pension benefit design to make benefits portable without further government action

3.2.1 Portability arrangements between countries

Most portability analyses and discussions focus on bilateral agreements, but the scope is much larger and includes unilateral and multilateral arrangements.
Unilateral actions (UAs) by the country where migrants earn labor income and are able to acquire pension rights include:

- Denying migrants access to the national social security scheme can be substituted by giving them the option to contribute to pension systems in their home country, as is feasible in Mexico, the Philippines, and Sri Lanka.
- Denying migrants access to the national security scheme can be substituted by voluntary access to either the host or the home country pension system. Enrollment in the home country pension system avoids host country constraints on cross-border benefit payments.
- Granting migrants full access to the statutory national pension scheme as well as full exportability of eligible pension rights may establish full portability. Hence all pensioners with a contribution length beyond the vesting period keep their acquired pension rights and receive pension benefits after the minimum retirement age is reached and other eligibility conditions are fulfilled. Ineligibility typically emerges because of a contribution record below the vesting period.

Bilateral agreements (BAs) are the centerpiece of current portability arrangements between countries. While they can, in principle, cover the whole range of exportable social benefits, they typically focus on long-term benefits such as old-age, survivors’, and disability pensions, and to a much lesser extent on health care benefits.

With regard to pensions, BAs can:

- Focus on temporary migrants only (e.g., waiving the contribution requirement to the pension scheme in the host country while making contributions mandatory in the home country).
- Establish mutual exportability of pension claims between the two countries.
- Allow migrants to continue paying their social security contribution to their home country for an extended period of time.
- Establish “totalization” (i.e., summing up) of the insurance periods in both agreement countries in order to pass binding effects of vesting periods.
- Cover all (legal or even illegal) migrants who have acquired pension rights.
- Establish full eligibility within the two agreement countries.
- Establish benefits for migrants facing different benefit schemes, e.g. a residence-based basic benefit scheme (such as Australia) and an earnings-related/contribution-based benefit scheme (such as Germany).

Multilateral arrangements (MAs) establish a general framework of portability for all or a subset of social benefits for a group of countries. These general rules are in most cases supported by more detailed BAs. Traditional MAs have been established in Latin America (MERCOSUR) and the Caribbean (CARICOM) and in 15 French-speaking countries in Africa (CIPRES); one was recently established between Latin America and Spain and Portugal (Ibero-American Social Security Convention); and one is under development for the Association of Southeast Asian Nations (ASEAN) countries.

The most developed MA is the one among EU member states (plus Norway, Liechtenstein, and Switzerland). Strictly speaking the EU arrangement is not an MA but an EU Directive that obliges EU member countries to revise their existing BAs accordingly. The main objective of the Directive is to
make all social benefit claims portable among EU member states in order to avoid discrimination and to establish free labor mobility, which is one of four core freedoms of the EU Treaties.\(^7\)

Portability works well for statutory pension benefits. In principle, this is also true for private sector schemes although benefit losses are possible if civil servants move between countries.\(^8\) Portability problems emerge in occupational and personal pension schemes, similar to problems which also occur within countries. This happens when individuals leave a DB scheme that is linked to their final salary, but also with DC schemes, which are essentially easy to handle as individual savings plans. But tax privileges granted when contributions are paid and returns are received render portability difficult and the EU has not yet found an effective way to establish comprehensive portability (see sections 4 and 5). Even if transfers can be made, they may inhibit the original intention of pension policy, for example, when a pension plan offers a lump sum in cash to workers when they leave the country but they are free to spend this money rather than investing it into another pension plan. So portability should ideally be portability of pension assets from one pension vehicle to another.

3.2.2 Multinational private sector providers

A promising approach, at least for supplementary pensions, is to use the service of a privately organized multinational provider (MP). MPs exist and function well for health care benefits. For example, Cigna, a Belgium-based service provider, services World Bank staff and retirees residing in Europe, as well as staff of the European University Institute. MP arrangements have been discussed, and sometimes implemented, for supplementary pensions of international workers in multinational enterprises. No portability problems emerge because insured persons are tied to one pension scheme even if they work in various countries. Multinational providers may prove superior to national providers with respect to interjurisdictional risk sharing, transmission of best practices and innovations across countries, and better information on the state of the world.

3.2.3 Changes in benefit design

The key idea behind changing the benefit design is to transparently disentangle three components that are lumped together in the pseudo-actuarial benefit design of social security schemes: the period insurance component, the presaving (or asset accumulation) component, and the redistributive component (Holzmann and Koettl 2015, 378–80).

The period insurance component is only valid for one period, in which it is consumed; hence, it does not require portability. This element is relevant in health insurance, does not exist in old-age pension schemes, but does exist in the form of survivors’ or disability claims if all are lumped together under one contribution rate.

The presaving component exists in all social benefit systems in one form or another. It is huge in health care and old-age benefit schemes, amounting to a high multiple of annual contributions. In a health care scheme without age-related contribution rates, presaving serves to accumulate reserves for health care costs that rise with age and for catastrophic health care. In (old-age) pension schemes, financial or nonfinancial presaving is the constituent component. Conceptually, a pure accumulation phase is followed by a decumulation phase in which annuities or phased withdrawals are paid out.
The redistributive component generates a gap between the value of accumulated individual contributions (including returns) and individual pension wealth (i.e., the present value of expected future pension benefit payments) at the end of each period. The redistributive component of a pension scheme is the consequence of a nonactuarial benefit design to pursue redistributive goals. For individuals the redistributive component may be positive or negative. A dominantly positive redistributive component typically emerges when a pension scheme is not only financed by contributions but also by transfers from the general budget.

If the three components can be separated conceptually and technically, then benefit portability between countries is substantially facilitated:

- Complete separation is attained, if there is no period insurance component, because disability and survivors’ pensions are separately organised, and no redistributive component, because all redistributive measures are taken outside the pension scheme. The remaining presaving component is purely actuarial and portability across borders upon migration can therefore be easily implemented.
- In a less complete separation, there is again no period insurance component and no redistributive component due to interpersonal transfers, but the presaving component is not actuarially fair because of government transfers. Although the redistributive component is ready for portability, the question emerges to what extent the source country should reduce the transferred amount because is partly financed through its national budget.

### 3.3 NDB and NDC schemes compared

Against the background of the objectives, instruments, and evaluation criteria presented above, how do DB and DC schemes compare on portability? To simplify and shorten the comparison, the focus is on nonfinancial DB and DC schemes (NDBs and NDCs), because most results are believed to also hold for financial schemes (FDBs and FDCs).

The following properties of NDC and NDB schemes are relevant for cross-border portability:

- Ideally, an NDC scheme has no period insurance component, as disability insurance is separately financed and organized (but coordinated with the NDC scheme); long-term survivors’ benefits are financed by own accounts and shared accumulations of spouses; and short-term transitional benefits during child-rearing periods are financed by other resources (Holzmann 2017; Kruse and Ståhlberg 2018).
- The “textbook” NDC scheme has no redistributive component within the insurance pool, and no redistributive component of budget subsidies to support financial sustainability. The existing redistributive components are explicitly financed through earmarked government transfers and reflect purposeful social policy objectives. These social policy objectives emerge if individuals cannot make own contributions due to disability, unemployment, maternity leave, family leave, etc., and they are financed by earmarked contributions of respective programs. Beyond that NDC schemes may also include selective matching or lump-sum contributions to individual accounts, e.g., to incentivize formal labor market contributions and/or to render schemes explicitly redistributive (Holzmann, Robalino, and Winkler 2018). Because of the above-
mentioned characteristic features of an NDC scheme, the accumulated individual account values reflect own contributions, rates of return that are consistent with financial sustainability, and earmarked external contributions accounting for specific individual circumstances. Thus, the values of these accounts are fully portable upon migration, either as NDC annuities or as accumulated amounts of pension wealth.

- In a traditional NDB scheme, disability and survivors’ pensions are typically part of the old-age benefits scheme design. But survivors’ pensions lose importance under reformed NDB schemes as own pension claims above a certain amount increasingly disqualifies descendants from receiving a widow/widower’s pension, and children receive fixed flat-rate amounts. Although these reforms reduce the contemporaneous insurance component they do not eliminate it, and no clear answers can be given which acquired rights should be portable upon migration.

- Traditional NDB schemes have a few explicit and many implicit redistributive components because of their design. Most countries also have a variable redistributive component to keep these schemes afloat. Making explicit redistributive components portable raises little objection, apart from is their costing. The implicit and often unknown redistributive components should cannot and should not become portable. Nevertheless serious problems arise in establishing appropriate adjustment mechanisms to account for characteristic NDB features like, e.g., the last salary assessment period, variable annual accrual rates, or nonactuarial decrements for earlier or later retirement.

A comparison of NDB and NDC schemes with respect to cross-border portability can be summarized as follows:

- Textbook NDC schemes promise full portability even in the absence of BAs and MAs. Full exportability of benefits in disbursement and preservation of the acquired rights are required. Full exportability can be established unilaterally; the full preservation until eligibility is a design component of an NDC scheme as the account values are annually indexed with the notional (sustainable) rate of return.

- Whether acquired rights in an NDC scheme prior to eligibility should become portable and transferred in real cash is a question of convenience and reciprocity with another NDC country. On the one hand, it is only the annual balance of notional inflows and outflows which needs to be settled in cash. On the other hand, the annuitized benefit at retirement is determined by country-specific cohort life expectancy at migration before retirement may invite benefit arbitrage. It would not affect the source country but would affect the retiree’s residence country if its cohort life expectancy is well below that of the sending country, while it offers immigration to groups with a higher life expectancy.

- NDB schemes will always need BAs or MAs to achieve portability. But the closer NDBs are to NDCs, the simpler are cross-border portability arrangements. BAs or fully-fledged MAs will still exist for NDC corridor countries for purely administrative reasons as well as for the portability for other social benefits, such as health care.

- While BAs exist between most industrialized countries, they are the exception rather than the rule between industrialized and developing economies. Holzmann and Jacques (2018) provide figures for 2013 which show that only 23.3 percent of worldwide migrants lived in
countries with BAs between home and host countries. Main beneficiaries of these BAs were migrants from high-income countries which made up over 80 percent of these migrants. The global progress in portability has been moderate in the last two decades (+1.4 percentage points since 2000, another year for which comparable data are available) and further progress on BAs is likely to be slow too. Since solutions which ensure portability for migrants of low income countries are urgently needed, UAs and appropriately designed NDC and NDB schemes in industrialized host countries seem to be the only promising short run solution.

4 The taxation of cross-border pensions: Facts, issues, and suggested solutions

The topic of taxing cross-border pensions is terra incognita in economics. No single recognized or competing paradigms explain how internationally portable pensions should be taxed. Yet countries typically have many bilateral double taxation agreements (DTAs) that include rules on how the rights are assigned to tax income from pensions and other retirement saving instruments. But this agreed tax treatment of pensions in a DTA for one migration corridor is not necessarily the same for another corridor, even if the corridor partners are neighbors. Furthermore, the tax treatment typically differs substantially across pension pillars (statutory, occupational, and personal). The guidance that exists on pensions is established in the Organisation for Economic Co-operation and Development (OECD) model tax convention on income and capital. Its relevant articles 18 and 19 suggest different tax treatment of cross-border pensions, viz residence taxation for private and source taxation for public sector pensions (see Annex 2). Furthermore, they are also highly incomplete as they deal only with the disbursement phase of pension taxation, leaving out income taxes during the saving and contribution payment phase as well as the return on pension wealth phase. Hardly any other area in economics has such a conceptual void, which has led to operational complexity and inconsistency in the taxation of cross-border pensions (Genser and Holzmann 2016, 2018).

This section summarizes recent attempts to highlight issues and offers a new proposal on how pensions should be taxed to address the double fairness dilemma of current pension taxation (Holzmann 2015; Genser 2015; Genser and Holzmann 2016, 2018): individuals risk unfair treatment due to the differences between and within countries, with some individuals paying the income tax on pension benefits twice – once during accumulation in the source country and again during decumulation in the residence country; others may benefit from tax exemption of pension wealth accumulation and disbursement in two countries. Of course, the latter case gives rise to tax arbitrage by strategic migration and pension planning. Countries risk fiscal unfairness as the current rules assign the right to tax cross-border pension benefits to the residence state, which inhibits the source state from recouping income tax losses which occurred when income spent on contributions and income from pension wealth returns were tax-exempt under deferred income taxation of pensions. In view of the rising share of international mobility of workers and pensioners these revenue losses grow and the fiscal situation is assessed as unfair and unsustainable.
To substantiate this proposal, this section highlights three areas: the state of taxation of cross-border pensions (section 4.1); the incompatibility of deferred income taxation and the OECD model tax convention (section 4.2); and a new framework for pretaxed pension/retirement income (section 4.3).

4.1 The state of taxation of cross-border pensions

Income taxation in most OECD countries is codified according to the Schanz/Haig/Simons principle of comprehensive income taxation, which regards any annual increase in personal wealth as taxable income. This is uncontroversial for individual pension wealth accumulated in financial institutions like pension funds, insurance companies, or banks, because wealth accruals increase individuals’ ability to pay and should therefore be taxed as a component of comprehensive income. Economically this is also true for notional pension wealth accruals within a statutory or mandatory occupational pension system, because individual pension claims under these systems increase ability to pay, although pension benefits are not capital-funded but financed on a pay-as-you-go (PAYG) basis. In fact, this difference between funded and unfunded pensions has led to a different tax treatment of these pensions.

To compare national pension tax practices, three phases of capital accumulation are distinguished in which income taxes can or should be levied: pension wealth accumulation through contributions or savings, returns on accumulations, and dissaving or withdrawal of pension wealth. Technically, comprehensive income taxation of savings can be characterized by a T-T-E income tax, where T indicates that the respective income flow is taxed at the going tax rate and E indicates that it is tax-exempt. With respect to old-age pensions comprehensive income taxation, viz. T-T-E, requires that income used to contribute to a pension system should be taxed; growing pension claims as returns to pension wealth should be taxed as well; but withdrawals of pension wealth are tax-exempt. In contrast to the comprehensive income principle, most national income tax codes tax PAYG financed pensions E-E-T, which implies exempting income spent on pension contributions and income from accruals in pension claims and taxing withdrawals of pension benefits. While a long-lasting dispute persists among public economists whether to tax capital income according to either T-T-E (Schanz/Haig/Simons) or E-E-T (Fisher/Kaldor), tax lawyers argue that the difference between taxing pensions and taxing other saving is nondiscriminatory because pension benefits are taxed as (deferred) labor income and other savings must be taxed when income is earned and again when returns on saving flow back as capital income.

A survey of pension taxation in OECD countries shows a much broader variety of tax rules for different forms of pensions (Table 2). To capture the different tax rules, “t” and “s” are introduced to indicate that in a certain phase of the pension cycle a lower tax rate, t<T, or even a subsidy rate s, is applied. In this sample a majority of countries apply expenditure taxation (E-E-T) and none of them comprehensive income taxation (T-T-E). Some countries impose a slightly higher income tax burden than E-E-T on statutory pensions, but many offer additional tax preferences down to complete tax exemption through all three phases of the pension cycle. Sweden is the only country that grants pension tax relief by not only deducting social security contributions from the personal income tax base but by granting a full tax credit for these contributions. The taxation of occupational and personal pensions reveals a similar pattern, with a less dominant cluster of countries using E-E-T. But columns 3 and 4 also exhibit a significantly broader scope of complexity, reaching from slightly reduced comprehensive income taxation down to full exemption of occupational as well as personal pensions over all three phases of
the pension cycle. In addition to the different forms of tax treatment represented in Table 2, country-specific personal pension schemes are often connected with direct subsidy payments that are granted to encourage voluntary enrolment in supplementary pension saving by further reducing the individual pension tax burden.

Table 2: Income taxation of pensions in OECD countries

<table>
<thead>
<tr>
<th>Tax regime</th>
<th>Statutory Pension</th>
<th>Occupational Pension</th>
<th>Personal Pension</th>
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<td>T-T-E</td>
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<td></td>
<td>Li, LV, PT; TR, US</td>
<td>EE, FR, IR, IS, RO</td>
</tr>
<tr>
<td>E-E-E</td>
<td>AM, AZ, BG, BY, GE, MC, MD, RS, RU, UA</td>
<td>BG, SK</td>
<td>BG, LT</td>
</tr>
</tbody>
</table>

Notes: Country abbreviations follow the two-letter ISO 3166 code listed in Annex 1.
1/ The OECD 2015 study does not cover AL, AM, AZ, BY, GE, LI, MD, MC, ME, RS, RU, and UA.

The complexity of the tax treatment of pensions increases when pension benefits are paid across borders. The avoidance of international double taxation of cross-border pensions is codified in bilateral DTAs. Although these treaties usually follow the recommendations of the OECD model tax convention, room for variance arises in income tax assignments for different forms of foreign income. Table 3 reveals the tax assignment of cross-border pension flows in treaties signed by Germany. The residence principle shows a marked dominance, but statutory pensions are frequently assigned exclusively to the source country. Shared tax assignments allowing for limited source country taxation and a respective foreign income tax credit in the residence country are rare.
Table 3: Tax assignment of cross-border pensions in German double taxation treaties

<table>
<thead>
<tr>
<th>Tax assignment</th>
<th>Statutory</th>
<th>Occupational</th>
<th>Personal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive residence taxation</td>
<td>CA, CH, CZ, EE, ES, FI, GR, HU, IR, IT, LU, PT, SE, SI, GB, US</td>
<td>AT, BE, CH, CZ, EE, ES, FI, FR, GR, HU, IR, IT, LU, MT, NL, PL, SE, SI, GB, US</td>
<td>AT, BE, CH, CZ, DK, EE, ES, FI, FR, GR, HU, IR, IT, LU, MT, NL, PL, PT, SE, SI, GB, US</td>
</tr>
<tr>
<td>Exclusive source taxation, progression proviso in residence country</td>
<td>AT, BE, DK, FR, IT (citizens), MT, NL, PL, SE</td>
<td>FR (mandatory)</td>
<td></td>
</tr>
<tr>
<td>Nonexclusive source taxation, residence taxation with tax credit</td>
<td>CA, DK</td>
<td>CA, DK (rents)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Genser and Holzmann 2018; Wellisch et al. 2008; and tax treaties.
Note: The country abbreviations follow the two-letter ISO 3166 code listed in Annex 1.

A closer look at the bilateral network of DTAs for a richer set of countries reveals three fundamental complexities of cross-border pension taxation (Genser and Holzmann 2016, 2018). First, countries tax cross-border pension benefits differently for different pension schemes. Second, countries tax inbound cross-border pension benefits differently depending on the source country. Third, outbound pension benefits are taxed differently depending on the residence country of the pensioner.

Based on Table 2 and Table 3, the application of different tax rules within and between countries for different forms of pensions violates horizontal equity, motivates strategic pension planning, and is a source of interpersonal fiscal unfairness. In addition, inconsistent and uncoordinated assignments for income taxes on retirement income create fiscal unfairness between countries and induce strategic migration of pensioners and international competition in pension taxation.

4.2 The incompatibility of deferred income taxation and OECD model tax convention

The OECD model tax convention addresses pensions explicitly in Articles 18 and 19 (see Annex 2). According to Article 18, pension benefits disbursed across-borders “in consideration of past employment” are taxable only in the residence country of the recipient. However, the article contains a proviso clause for pension benefits paid out to a recipient in the residence country who had been employed in the source country by a public body. In this case the pension is taxable in the source state unless the recipient is also a national of the resident state.

The dominance of the residence principle is motivated by administrative arguments. On the one hand, the residence state of the recipient of a foreign pension is considered to be “in a better position than the source state to take into account the recipient’s overall ability to pay, which depends on the worldwide income and the personal circumstances” (OECD 2014). On the other hand, residence taxation eases tax compliance of the recipient of foreign pension benefits because tax obligations are concentrated in the residence country only. Source taxation on public pensions according to Article 19
was originally a byproduct of income taxation of public employees “inherited from traditional rules of international courtesy.” However, the scope and fiscal importance of Article 19 increased with the growth of the public sector in many countries and with the extension of public activities abroad. The OECD model tax convention thus changed the assignment of taxes on public salaries and wages (and subsequent pensions) from a potential to an exclusive right of the source state.

From an economic perspective, it is important to recognize that the assignment of tax competences in the OECD model tax convention is restricted to the third phase of the pension cycle, when pension benefits are paid out across the border. The possibility of taxing pensions while pension wealth is accumulated is addressed neither in the model tax convention nor in the elaborate commentaries on the particular articles. An immediate consequence of this gap is that pensions that were pretaxed in the source country during the accumulation period will be double taxed if the residence country taxes pension benefits.

This undesirable result can be avoided if the source country’s tax code determines deferred income taxation on pensions, as proposed by the EU Commission. Under an E-E-T regime no income tax is levied when contributions are paid and pension wealth earns returns, and income tax only becomes due when pension benefits are paid out. For a pensioner who emigrates after retirement, and for whom pension benefits are taxed exclusively in the immigration country, double taxation cannot occur. But simultaneously the total income tax payment on this pension goes to the resident state and the income tax revenue of the benefit-paying source state on earned income spent on pension contributions is zero.

It could be argued that the assignment of pension benefit taxation to the residence state must not be regarded as an unfair or inequitable international distribution of income tax revenues, because the model tax convention assigns the right to tax returns from capital to the residence state of the capital owner and only a limited right to tax these returns as well to the source state. But there is one important difference between pension benefits and capital returns: Pension benefits comprise withdrawals of pension wealth as well as returns to pension wealth. Passing on the right to tax pension benefits from the past residence state to the new residence state implies that the right to tax earned income spent on contributions to the pension system is assigned to the new residence state after migration although it was assigned to the former resident state when this income was earned. This comprehensive transfer of taxing rights on pension benefits differs fundamentally from transferring the right to tax returns from accumulated and correctly taxed personal wealth to the new residence state.

Table 4 presents a set of simplified treaty examples that illustrate the constrained capability of the model tax convention to solve the double equity dilemma. For a given set of parameters, the table illustrates the interaction of three different tax regimes in country A, viz. expenditure taxation E-E-T, prepaid expenditure taxation with exempt returns T-E-E, or comprehensive income taxation T-T-E, and two assignments of income taxation for a pensioner who migrates to country B after retirement: benefit taxation according to the residence principle or the source state. To interpret the numbers, keep in mind that income taxation subject to the source principle replicates the tax situation in the no migration case.

Three results in table 4 reveal the problems of the OECD model tax convention with respect to pension taxation:
The last row shows that application of the residence principle avoids international double taxation only in the case of expenditure taxation, whereas the treaty rules do not eliminate double taxation if pensions are pretaxed, because tax credits only account for source country taxes on pension benefits.

For the source country, deferred income taxation under the residence principle implies that the deferred income tax revenue on cross-border pension benefits is zero.

For the residence country, income taxation under the source principle implies that the income tax revenue on cross-border pension benefits is zero.

Table 4: Income tax on pensioners migrating from country A to B under different tax regimes and tax assignments

<table>
<thead>
<tr>
<th>Parameter selection:</th>
<th>Labor income</th>
<th>Contributions rate</th>
<th>Income tax rate</th>
<th>Return rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>0.2</td>
<td>0.3</td>
<td>0.5</td>
<td></td>
</tr>
</tbody>
</table>

Residence principle:
- E-E-T
- T-E-E
- T-T-E

Source principle:
- E-E-T
- T-E-E
- T-T-E

| A1 income           | 120          | 120              | 120             | 120          | 120          | 120          |
| A1 pension contributions | 24          | 24               | 24              | 24           | 24           | 24           |
| A1 income tax base  | 96           | 120              | 156             | 96           | 120          | 156          |
| A1 income tax       | 28.8         | 36               | 46.8            | 28.8         | 36           | 46.8         |
| A2 pension benefit  | 36           | 36               | 36              | 36           | 36           | 36           |
| A2 income tax base  | 0            | 0                | 0               | 36           | 0            | 0            |
| A2 income tax       | 0            | 0                | 0               | 10.8         | 0            | 0            |
| B2 tax base         | 36           | 36               | 36              | 0            | 0            | 0            |
| B2 income tax       | 10.8         | 10.8             | 10.8            | 0            | 0            | 0            |
| Total income 1/     | 132          | 132              | 132             | 132          | 132          | 132          |
| Total tax 1/        | 39.6         | 46.8             | 57.6            | 39.6         | 36           | 46.8         |

Source: Authors’ calculations.
Note: A1 is working period in country A, A2 is retirement period in country A, and B2 is retirement period in country B.

1/ Net present value, normal return rate zero.

4.3 A new framework for pretaxed pension income

The starting position is the weakness of the prevailing taxation architecture outlined in subsection 4.2. In subsection 4.3.2 we show that the double fairness dilemma caused by migrants can be solved by moving from deferred toward frontloaded taxation of pensions. In addition, three pension tax payment options are suggested to facilitate the implementation of frontloaded pension taxation.

4.3.1 The starting position
The starting point for a new framework for pension taxation is the existence of two unsolved problems in the prevailing architecture of existing pension tax systems. First, there is the simultaneous orientation of tax equity along two mutually exclusive equity standards: comprehensive income taxation and expenditure taxation. These standards imply different time patterns of capital income taxation over the cycle of accumulation and withdrawal of capital. The Schanz/Haig/Simons principle requires taxation while capital wealth accrues, viz. T-T-E, whereas the Fisher/Kaldor principle defers taxation until capital wealth is withdrawn and used for consumption, viz. E-E-T. The Fisher/Kaldor approach forgoes the double taxation of savings and establishes intertemporal neutrality on consumer spending decisions. Countries typically apply comprehensive income taxation for capital income not related to retirement and apply various forms of Fisher/Kaldor-type taxes on different forms of retirement income. Pure expenditure taxation is frequently applied for statutory pensions, and less frequently for occupational pensions. Highly differentiated and country-specific forms of taxation are applied to personal pensions (Table 2).

Second, tax assignment and balancing methods in DTAs that try to avoid double taxation of pensions are codified only for cross-border pension benefit flows and ignore the fact that pensions might have already been pretaxed when pension wealth was accumulated.

4.3.2 The proposal

Double taxation of pensions can be avoided by requiring that:

- Pensions are taxed according to the Fisher/Kaldor principle, and
- Fair taxation of pensions has to account for pension taxes over the whole pension cycle.

To satisfy the first requirement the proposal makes use of a fundamental equivalence property of the Fisher/Kaldor approach. The nonneutrality of comprehensive income taxation can be avoided not only by expenditure taxation (E-E-T), but also by a corresponding frontloaded income tax regime (T-t-E), which shares the intertemporal neutrality property of the backloaded Fisher/Kaldor-type expenditure tax and is economically equivalent under a set of simplifying assumptions. Under a T-t-E regime, income spent on pension savings is taxed when contributions are made and exempted when pension benefits are withdrawn from accumulated pension wealth. Moreover, returns on pension wealth are only liable to tax if they exceed normal returns that are tax-exempt. This partial income tax exemption of returns is indicated by t. t<T also reveals that the tax liability under the two equivalent forms of Fisher/Kaldor taxation is smaller than under comprehensive income taxation.

The second requirement makes use of the time pattern of T-t-E taxation. Pensions are pretaxed in the source country, while pension benefits are exempt. To avoid double taxation of cross-border benefits, it is necessary to exempt pension benefits in the residence country as well. Compared to deferred income taxation, under T-t-E, the source country does not suffer from income tax revenue losses on deductible contributions when individuals migrate as retirees nor when they emigrate before retirement, as their pension wealth has been appropriately taxed upon accrual.

Pretaxing pensions following the Fisher/Kaldor principle should be attractive to treaty partners because it generates a fair distribution of income tax revenues and avoids international double taxation of pensioners even under the existing assignment rules bilateral treaties.
Pretaxation of pension implies that the recouping pressure of deferred income taxation in source states is absent upon migration.

No income tax is due for pension benefits paid out to migrants and non-migrants in source as well as in residence states.

Pretaxation of pension income accounts for the personal circumstances of the income earner and his ability to pay under unlimited tax liability as a resident of the source country.

Two key arguments that gave reason to assign the competence of taxing cross-border pensions benefits to the residence country no longer apply: the recipient is not taxed under limited tax liability on pension benefits in the source country after migration, because his pension benefits were already pretaxed under unlimited tax liability when he was a resident of the emigration country; and the recipient would only have to comply with the tax authority in the residence country after migration because his pension benefits are tax-exempt in the source country.

If all pensions are pretaxed and pension benefits are not taxed in both treaty countries, then assignments according to articles 18 and 19 can be erased.

At the national level pretaxation of pension benefits offers some further attractive features for source and residence countries.

- Administration and compliance costs of pre-taxing pension will be lower than under deferred pension taxation because monitoring of deductible pension saving becomes redundant.
- Another substantial relief in tax compliance and tax administration is that pensioners will only have to file tax returns for the rest of their lives if they receive market income but not if pension benefits are their only source of old-age income.
- Pre-taxation of pensions implies that the income tax authority which keeps track of the relevant personal circumstances of the income earner and his ability to pay under unlimited tax liability anyway also handles pre-taxation of pension benefits.
- Equity norms, on which progressive income tax schedules are based, will no longer be eroded by deferred pension taxation, which is particularly beneficial for high income earners, who escape high marginal income tax rates on earned income invested in pension premia and are taxed at substantially lower tax rates on pension wealth withdrawals after retirement.
- The problem of taxing pension benefits under limited tax liability in the source state after migration is avoided because pensions were already pre-taxed under unlimited tax liability in the emigration state.
- Pensioners would only have to comply with the income tax authority in the residence state after migration if they earn other taxable income beside pension benefits.
- If pension benefits are not taxable, pensioners are offered an incentive to supplement their pension benefits by tax-free labor or rental income as long as these additional earnings do not exceed the personal income tax allowance.
- Monitoring costs for keeping track of taxable excess returns on pension wealth may be kept low if these returns are treated as capital income and taxed at a flat rate under a dual income tax and which can be handled efficiently at the pension fund level.
The solution to the double taxation problem of cross-border pensions is simple if countries are willing to switch from deferred income taxation to frontloaded expenditure taxation. If, however, one state decides to keep deferred pension taxation, then avoidance of international double taxation requires that Article 18 must be changed and assign the right to tax cross-border pension benefits to the source state rather than to the residence state. Consequently, the OECD model tax convention should then be revised and codify a pension article which assigns the right to tax pension benefits exclusively to the source state.

4.3.3 Three tax payment options

The frontloaded pension tax approach suggests that tax liabilities must be cleared immediately upon income tax assessment. But this is not a necessary consequence. The tax authority may be ready to accept deferred payment of the assessed tax liability in the same fiscal way as expenditure taxation defers taxation of saved income. Deferred down payment of tax debt is neutral for the intertemporal government budget constraint as long as the present value of deferred tax payments is equal to the present value of the assessed tax liability. For this reason, three proposals are presented that complement the T-t-E frontloaded pension tax regime by decoupling the tax statement of the tax authority and the prescription of the tax payment.

(i) The immediate tax payment option requires that tax liabilities are settled when they occur. This immediate tax payment does not (and in this proposal should not) imply a loss of purchasing power for the pension saver. The tax liability can be settled when an appropriate share of the individual contribution to the pension system is used to pay the tax bill, which implies that individual pension wealth accumulation is reduced by the tax factor \((1-T)\). The same procedure can be applied to settle the income tax liability on excess returns which accrue in the accounts of the pension funds. If pension funds are obliged to pay income tax to the tax authority pension wealth returns are reduced by the tax factor \((1-t)\). No income tax is due when pension benefits are disbursed after retirement. Since all income tax liabilities on pension wealth are settled immediately, no revenue loss occurs in the source state if the pension saver emigrates as a worker or a pensioner.

(ii) Under the deferred tax payment option, the tax liabilities are assessed according to the T-t-E regime, accumulated until retirement, and then turned into a tax annuity that must be paid to the tax administration in line with the disbursement of the monthly pension benefits (Holzmann 2015). The approach combines frontloading of tax assessment \((T-t-E)\) with a material backloading \((E-E-T)\) of tax payment and defers the tax-induced net income loss by paying out pension benefits net of the tax annuity. If a pension saver emigrates before retirement and the gross pension assets remain in the source country, the tax annuity is withheld when pension benefits are paid out and transferred to the treasury in the same way as for a resident retiree. If the pension wealth is transferred abroad upon migration, then the accumulated tax liability becomes due as a form of exit tax that is also paid by the pension fund, and the migrant’s transferrable pension wealth is reduced accordingly. If a pensioner dies before the accumulated tax liability is redeemed, the pension fund is able to settle the open tax debt.

(iii) Under the distributed tax payment option, the payments of the accumulated tax liability are spread evenly across the whole pension cycle by charging a constant rate \(t^*\) on contributions, pension wealth returns, and pension benefit payouts. The rate \(t^*\) should be chosen to balance the expected aggregate
present value of tax payments and the expected present value of the frontloaded pension tax liability. To balance tax liability and tax payment at the individual level may be left to a recalculation of the monthly payment upon retirement by means of a supplemental tax annuity, which could either be an individual surtax or a tax decrement on t*. Emigration or death of the pensioner should be settled by the pension fund as outlined above. A constant tax payment rate t*, which should be between one third and one-half the average income tax rate, may increase political support because the advanced tax revenue inflows and later tax revenue losses level out over the lifespan of individuals. Moreover, t* increases the toolbox of national tax policy and mitigates the fiscal transition effects that accompany the switch from traditional deferred to a frontloaded pension taxation.

Decoupling front-loaded tax assessment and tax payment does not affect the tax burden of migrants and national tax revenue in present value terms. Liquidity effects on disposable income are avoided because tax payment only affects pension wealth accumulation in the pension fund. Liquidity effects for the government budget avoid a sharp rise of income tax revenue after the switch to front-loading and political pressure to balance the budget by rising expenditures but do not constrain the scope for public borrowing.

Deferred payment of taxes smooths the income tax revenue of the government in the years after the pension tax reform. Front-loaded pension taxation in the source state and exempting pension benefits precludes international double taxation. Unlimited income tax liability in the source country, where income is earned and where pension wealth is accumulated as resident, and unlimited tax liability in the new residence country after migration, are in full accordance with vertical equity and low costs of tax compliance and tax administration.

5 Frontloaded taxation, payment options, and DB and DC in comparison

For backloaded pension taxation, pension benefits are taxable income and the type of pension system, DB or DC, does not affect the way of assessing and paying income tax. The situation is different under the frontloaded taxation of cross-border pensions due to the tax base definition under a DB or a DC scheme. There is no difference in the taxation of income spent on contributions to DC or DB pension schemes. This component is recorded in the books of pension funds and can be taxed at the individual income tax rate of the pension saver.

A crucial problem of frontloaded pension taxation is the determination of taxable excess returns on accumulated pension wealth. These excess returns are depending on the type of the pension scheme

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1 Exemption of cross-border benefits does not exclude the option of applying the progressivity proviso clause if the residence state wants to ensure that pension benefits should increase the income tax rate on other taxable income if this option is codified in its DTAs.
and they have to be calculated appropriately by the pension funds. For DC systems, notional or financial, returns on wealth comprise, e.g., interest income, capital gains, public transfers or substitute contributions for qualified periods, and are recorded in the annual balance sheets of the pension fund. The breakdown of aggregated returns for individual pension savers requires a determination of a normal rate of return and a general mechanism of assigning the remaining excess returns to each pension saver. For DB systems, notional or financial, pension wealth is the present value of expected benefits and not directly related to individual contributions. DB pension funds, which are financed on a pay-as-you-go basis, must be forced to provide extended balance sheets to calculate the expected individual pension wealth status of their pension savers in present value terms for each year. The problem to be solved is to capture the redistributive components of the DB system in line with the pension plan and to calculate individual pension wealth figures. Excess returns can be derived from these pension wealth figures analogously to DC schemes. In a back-loaded pension tax regime these redistributive effects are fully captured in pension benefits and taxed when pension wealth is disbursed. In a front-loaded pension tax system this accumulation of DB pension wealth is reflected in excess returns. While it is true that calculating DB pension wealth is a challenge, a better information on the individual status of notional pension wealth is highly welcome to base individual supplementary pension saving but also public pension policy on transparent and resilient data.

An economically less attractive form of front-loaded pension taxation would be to ignore excess returns in DB system and to tax only income spent on tax contributions to DB pension plans. Although tax administration and compliance would be simplified, the equivalence between front- and back-loaded income taxation would be destroyed and tax revenue will be lowered. Moreover, frontloading makes the pension system more progressive, even though low-income earners will have to pay income tax on their pension contributions in comparison to a backloaded tax system, because the progressivity erosion effect of deferred pension taxation is prohibited. But intensifying progressivity further by exempting excess returns is an intransparent and not recommendable policy device. If vertical equity targets support an increase in progressivity this should be handled directly, e.g. by focusing on lifetime rather than annual ability-to-pay.

5.1 The front-loaded tax assessment and immediate payment option

Immediate payment of income tax on pension contributions under DB and DC schemes simplifies annual income taxation because filing and monitoring of deductible contributions are no longer necessary. The tax-induced loss of net disposable income can be avoided, if the additional tax liability is not charged separately but paid as a share of the contributions to the pension fund.

Immediate payment of income tax on excess returns to pension wealth depends on the availability of annual tax base data. The provision of these data by pension funds should be easy for funded DC schemes, but this might not be the case for DB schemes. The calculation of taxable excess returns crucially depends on the level of annual normal returns. Depending on the pension scheme it may well be that excess returns are similar or even the same large groups of pension savers. When pension funds provide data on excess returns annually or for a period of several years, income taxes due should also be paid directly by the pension fund as a deduction from individual pension wealth. This tax payment is administratively simple, if the tax code treats excess returns as flat-rate-taxed capital income.
under a dual income tax. Progressive taxation with differentiated rates is possible but complicated and costly with respect to compliance and administration. Under this income tax payment arrangement frontloaded taxation does not cut the net purchasing power of the income earner but reduces the accumulated pension wealth. Yet, the purchasing power of the pension benefit after retirement is not reduced because the pension benefits remain untaxed.

5.2 The frontloaded tax assessment and deferred payment option

Under the deferred payment option, the annual tax liabilities on contributions and excess return are calculated in the same way as under the immediate payment option. Consequently, also the problems caused by the injection of redistributive transfers are the same. In addition, the implementation of the deferred payment option requires that the income tax debt is correctly accumulated with an appropriate interest rate until retirement and then transformed into a tax annuity that is withheld and forwarded to the tax authority by the pension fund when pension benefits are paid out.

Under funded DB and DC schemes the interest rate used for the calculation of the income tax liability at retirement is the normal interest rate which is used to define excess returns. For NDC schemes, the notional interest rate which keeps the scheme sustainable, is part of the scheme design and well known. For NDB schemes, the notional interest rate is normally unknown and requires a complex estimation for which the data may not be fully available. Good arguments exist to use the higher, unsustainable internal rate of return for indexing. A higher interest rate would cause two countervailing effects, because it reduces excess returns, the tax base in each tax period, but it increases the nominal value of the tax debt due at retirement.\(^\text{16}\)

At retirement the accumulated tax liability due needs to be translated into the tax annuity. This is straightforward in an NDC scheme, as all the information for calculating the benefit annuity can be used for the tax annuity, most importantly the remaining cohort life expectancy. This is not a minor issue, as few countries publish official cohort (and not only period) life expectancy tables. The difference between cohort and period life expectancy at age 65 can be sizable, and currently reaches up to nine years for both genders in some countries (Ayusa, Bravo, and Holzmann 2018). Applying a too-low period life expectancy would result in a too-high tax annuity and, compared to an annuity calculated with cohort life expectancy, an incorrect, too-high tax payment. However, a typical NDB scheme uses period life expectancy to estimate its financial solvency, which implies too-high pension annuities but also too-high tax annuities if the available period life expectancy were to be used. But if individuals actually live according to the survival probability of the cohort life expectancy, they have a higher pension wealth and a higher tax liability at retirement. With high differences between cohort and period life expectancies, as in Australia, this may amount to an increase of pension wealth of up to 50 percent at retirement, of which only a share is recovered by future higher taxes (e.g., 20 percent).

To summarize, the deferred tax payment option requires more technical effort and faces more estimation and implementation challenges compared to the immediate payment option. This is true for all pension schemes. On the other hand, the accumulation process of tax liability does not necessarily require an appropriate calculation of the annual income tax base for excess returns and opens room to recalculate the tax base for periods which are administratively more suitable. This also includes the
possibility to balance positive and negative annual "excess returns" over the pension cycle. In contrast to immediate tax payment option the crucial target of the deferred payment option is the final accumulated pension tax liability upon retirement.

5.3 The frontloaded tax assessment and distributed payment option

Payments under the distributed payment option are not tax annuities, in principle. This option makes use of a pseudo tax rate $t^*$ which is applied to all accumulation and decumulation entries along the pension cycle: contribution payments, receipts of excess returns, and disbursed pension benefits. The present value of this payment stream to the tax authority should be equal to the present value of the front-loaded income tax, viz. $\text{NPV}(t^*; t^*; t^*) = \text{NPV}(T-t-E) = \text{NPV}(E-E-T)$.

For a predetermined stream of labor income, a given tax regime and an actuarially fair DC pension system it might be possible to solve the equation above, but there is, however, no way to fix $t^*$ in advance in a world of imperfect information. Fixing $t^*$ is a political decision which helps to spread pension taxation along the full pension cycle. While pension wealth is accumulated until retirement a substantial part of the lifetime pension tax burden due has already been paid. At retirement, when the present value of frontloaded pension tax is known, there is an open tax liability between one-third and one-half of the frontloaded lifetime pension tax. Then a recalculation of $t^*$ is required to ensure that the rest of the tax debt is correctly settled after retirement.

Basically, the deferred payment option can be interpreted as a special case of the distributed payment option with $t^* = 0$ during the accumulation phase and $t^*$ equal to the annuity payment after retirement. The deferred payment option tries to smooth pension tax payment by choosing a rate which is significantly lower than the statutory income tax rate. While front-loaded pension taxation seems relatively easy for DB schemes because all relevant data are available in pension funds and compliance as well as monitoring cost are low, DB schemes require additional effort of pension funds in providing resilient data on personal pension wealth. Combining pretaxed pension taxation with different payment options is a separate decision which can be made independently and does not depend on the pension system. Deferred payment schemes leave administrative leeway with respect to providing required data on excess returns, but they also require additional technical effort to calculate consistent values of the accumulated individual tax debt and the subsequent annuities. Compromises on the calculation of individual pension wealth in order to facilitate frontloaded taxation of DB pensions should be avoided because transparency on the pension wealth status of citizens is valuable on its own for pension savers, for pension providers, and for policy makers.

6 Conclusions

A feature of globalization is the increasing international mobility of individuals during their working life and after retirement. This trend has existed since the 1960s and does not seem to attenuate. For mobile individuals as well as for home and host countries, this raises the issue of portability of acquired pension rights as well as the taxation of cross-border pensions. If the design and arrangements for these issues
between source and destination countries are not done well, the result will be less fairness for individuals, less fiscal fairness for countries, and lower administrative efficiency. The effects on these three outcome criteria also depend on the type of pension benefit scheme in place — DB or DC.

Portability of pension benefits and related retirement income savings can be established through three types of instruments: unilateral, bilateral, or multilateral legal arrangements; multinational providers from the private sector; and benefit redesign. These three instruments are both substitutes and complements. Thus a pension benefit redesign toward DC schemes simplifies the portability of pensions as accumulated resources can be easily transferred upon migration. This feature makes bilateral arrangements — the workhorse of portability — either unnecessary or easier to establish. The DC approach also makes multinational schemes easier to operate. Yet portability of both DB and DC benefits may be impeded by tax considerations, particularly if tax concessions granted during accumulation must be repaid upon emigration.

The current taxation of cross-border pensions across all migration corridors is highly complex and inconsistent. This violates equitable taxation among individuals, fair distribution of revenues between countries, and efficiency in tax administration and compliance. This outcome is not sustainable in a world of internationally mobile workers and retirees. The key reasons are the mix and heterogeneity of national pension tax principles and the economically unsound guidance of the OECD model tax convention for bilateral double taxation treaties. The current practice of taxing pensions does not exclude zero taxation or double taxation of cross-border pension benefits and the recouping of tax preferences in the source country when pension savers move to a new residence country.

While deferred taxation of pension benefits is a welcome form of pension taxation in a closed economy setting, it does not achieve fairness and efficiency in a global setting. This paper proposes moving toward frontloaded expenditure taxation of pensions and discusses its implementation for DB and DC schemes. In addition, it suggests three economically equivalent payment options — immediate, deferred until retirement, or distributed across the whole pension cycle which can be combined with frontloaded pension taxation. Operating frontloaded pension taxation in financial as well as nonfinancial DC schemes is regarded as a simple and efficient in an open economy setting for all payment options and leaves room for the policy maker to choose the preferred form of tax payment. Calculating and taxing excess returns is more affording in DB schemes, in particular in NDB schemes and further decisions of the policy maker are necessary, e.g. to replace the NDB scheme by a NDC scheme, or to accommodate pension design to frontloaded pension taxation and to implement redistributive objectives with the help of supplementary benefit measures.

Annex 1 Two-letter country abbreviations subject to ISO code 3166

| AL Albania | CY Cyprus | GR Greece | MC Monaco | RO Romania |
| AM Armenia | CZ Czech Republic | HR Croatia | MD Moldova | RS Serbia |
| AT Austria | DE Germany | HU Hungary | ME Montenegro | RU Russia |
| AU Australia | DK Denmark | IR Ireland | MK Macedonia | SE Sweden |
Annex 2  OECD Model Tax Convention on Income and on Capital

Article 18 PENSIONS
Subject to the provisions of paragraph 2 of Article 19, pensions and other similar remuneration paid to a resident of a Contracting State in consideration of past employment shall be taxable only in that State.

Article 19 GOVERNMENT SERVICE
1. a) Salaries, wages and other similar remuneration paid by a Contracting State or a political subdivision or a local authority thereof to an individual in respect of services rendered to that State or subdivision or authority shall be taxable only in that State.

b) However, such salaries, wages and other similar remuneration shall be taxable only in the other Contracting State if the services are rendered in that State and the individual is a resident of that State who:
(i) is a national of that State; or
(ii) did not become a resident of that State solely for the purpose of rendering the services.

2. a) Notwithstanding the provisions of paragraph 1, pensions 2. a) Notwithstanding the provisions of paragraph 1, pensions and other similar remuneration paid by, or out of funds created by, a Contracting State or a political subdivision or a local authority thereof to an individual in respect of services rendered to that State or subdivision or authority shall be taxable only in that State.

b) However, such pensions and other similar remuneration shall be taxable only in the other Contracting State if the individual is a resident of, and a national of, that State.

3. The provisions of Articles 15, 16, 17, and 18 shall apply to salaries, wages, pensions, and other similar remuneration in respect of services rendered in connection with a business carried on by a Contracting State or a political subdivision or a local authority thereof.

Article 21 OTHER INCOME
1. Items of income of a resident of a Contracting State, wherever arising, not dealt with in the foregoing Articles of this Convention shall be taxable only in that State.

2. The provisions of paragraph 1 shall not apply to income, other than income from immovable property as defined in paragraph 2 of Article 6, if the recipient of such income, being a resident of a Contracting State, carries on business in the other Contracting State through a permanent establishment situated therein and the right or property in respect of which the income is paid is effectively connected with such permanent establishment. In such case the provisions of Article 7 shall apply.

References


2 This definition draws on the general definition of the portability of social security benefits developed by Cruz (2004) and Holzmann, Koettle, and Chernetsky (2005).

3 As occurs in the Gulf Cooperation Council countries for essentially all expatriates, and for some categories of foreign workers in Hong Kong, Malaysia, and Singapore.

4 The Philippines and Mexico fall somewhere between the first and second examples. The Philippines allows workers to contribute to national pension schemes but independent of access in the host country. Similarly, Mexican migrants can get access to health care benefits for a flat-rate premium (for their families left behind or themselves when they return) independent of their insurance in the host country (i.e., the United States).

5 For a historical and legal background on BAs, see Strban (2009).

6 No single study (inventory) captures the content of BAs across the world or even of subregions such as Europe; to the authors’ knowledge, no single evaluation has been undertaken to assess the effectiveness of BAs and MAs.
The four freedoms were set out in the Treaty of Rome (1958), extended by the Single European Act (1987), and strengthened in the Lisbon Treaty (2009).

Both authors experienced this when leaving their (former) civil servants scheme as Austrian academics to join a similar scheme in Germany; in Austria, their acquired rights in the civil servants schemes were transferred to statutory pension scheme with substantial reductions in pension wealth. For one author this happened again when he left German academia to move to the World Bank in the United States.

A main difference may emerge between funded and unfunded provisions with regard to the actual portability of financial assets when changing residence versus the mere recognition of rights while the assets remain in the source country. The latter is always the case in unfunded provisions as the pay-as-you-go (PAYG) asset remains in the source country. In funded provisions the assets can remain in the source country (as is typically the case under FDBs) but may also be transferred to the new residence country under FDC schemes, but there is no obligation and possibly no incentives to do so.

Abstracting from heterogeneity in longevity, which can be corrected for (see Holzmann et al. 2018).

For more remarks on these direct financial incentives, see OECD (2015, section 7).

The inconsistencies in cross-border taxation of pensions are grounded in theoretical ambiguities of taxation of pensions and their implementation in the national context. For the state of the theory of pension taxation and the implementation of pension taxation in key industrialized countries, consult Holzmann and Piggott (2018). Mirrlees et al. (2010) offer broader perspectives on the taxation of labor and capital and call for an integrated approach for the design of pensions and their taxation.

Standard assumptions are that the tax schedule remains unchanged over the pension cycle, the tax schedule is perfectly adjusted to inflation, and the tax regime treats positive and negative incomes symmetrically. Another crucial issue is the implicit assumption of progressive tax systems of what is considered tolerable and not regarded as violating tax equity under fluctuating period incomes over the lifecycle, which affects the lifetime tax burden of individuals with exactly the same present value of lifetime income. Perfect lifetime tax equity would require applying the progressive tax schedule to a notional average gross period income over the lifecycle. The same implicit assumption is necessary for lifetime pensions, although the tax burden differences are salient: In contrast to T-T-E taxation, deferred income taxation E-E-T implies that low pension benefits after retirement may go untaxed if they fall below the general income tax allowance. Perfect equivalence is attained under the implicit assumption that taxable lifetime earnings including taxable pension benefits are taxed by calculating the notional gross period income over the pension cycle.

Note that the progressivity erosion effect of deferred income taxation does not occur in the deferred tax payment option (or in the distributed tax payment option) because the tax liability under frontloading is fixed in present value terms and only the income tax payment is deferred.

The excess rate of return is conceptually the difference between the rate of return of an asset minus the risk-free rate of return, typically proxied by the long-term government bond rate. Under steady-state conditions and other reasonable assumptions, the long-term government bond rate and the notional rate of return should not be different and should be equal to the gross domestic product growth rate.

As this section deals primarily with NDC versus NDB schemes, FDB and FDC schemes are discussed only briefly here. The FDC rate of return suggests itself to be used to accumulate the taxes due as it also indexes the funds from which the benefits can be paid. Again, this proxies the T-T-E = E-E-T condition. Good arguments exist to use the annual internal rate of return for FDB schemes, as for NDB schemes. But the balancing of FDB schemes (which do not exist at national level and have mostly been closed at occupational level for new entrants, or transferred to FDCs) can have many forms, including partial or full default. Calculating the resulting (negative) internal rate of return and translating this into reduced and zero tax accumulations due would be very complex.