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Pension Systems in the Developing World: Current Challenges and Future Directions

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Pension Systems in the Developing World: Current Challenges and Future Directions

By

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March 2021

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Foreword

Today, people's greatest financial concern is no longer paying their short-term bills or credit-card debt. According to the new study by Zurich Insurance Group and the University of Oxford (2019), 'retirement security is the top financial worry' for workers in 14 out of 16 countries. Likewise, recent surveys on old-age income suggest that nearly half of the respondents from different parts of the world do not feel secure about having a comfortable retirement (AARP Foundation, 2018; Credit Suisse, 2020).

While a lack of retirement savings has turned out to be a global phenomenon, most studies cover the design of pension systems in developed countries, which face relatively few challenges compared to developing ones. Moreover, from a handful of papers on developing regions, there is a tendency to discuss pension-related issues in the context of specific countries or topics. To this end, this study aims to provide an overall and detailed picture of the public and private pension systems in the developing world, including the present challenges and future directions.

The first part of the paper presents an overview of public pensions in developing countries. It illustrates the impact of ageing on sustainability and the adequacy of pay-as-you-go plans, along with some suggestions for the future of state pensions. In the second part, the paper focuses on private pension systems in the developing world and discusses the reasons for low pension savings with respect to the issues of coverage, contribution, and investment performance. This section also concludes by proposing certain recommendations for private pensions in the light of financial as well as behavioural and technological developments.

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Executive Summary

Developing countries are aging faster than developed ones and expect to lose their young population advantage over the long-term. While from the governments' perspective, this will raise the costs of public pensions, when it comes to retirees, they will have to settle for a lower standard of living. In this respect, pension funds may provide an alternative source of old-age income; however, they still have limited importance in most developing countries. Given such a background, this paper aims to describe the current and long-term picture of pension systems in developing countries, address the main challenges that these systems face today, and present some suggestions on pension issues that are generally discussed only in the developed world. Due to the scarce and fragmented information on pensions in developing countries, the paper relies on up-to-date data collected from several sources—notably the OECD, World Bank, IMF, European Commission, International Organisation of Pension Supervisors (IOPS), and Internacional de Organismos de Supervisión de Fondos de Pensiones (AIOS).

The first part of the paper illustrates the current and future landscape of public pensions in developing countries. Given the expected aging trends, developing regions seem to encounter more difficulties in the fine balancing between financial sustainability and the adequacy of state pensions. While in some Asian countries, public pension spending is expected to more than double by 2050, in Brazil and Slovenia, expenditure on state pensions alone is likely to exceed the maximum public deficit level defined by Maastricht criteria. Albeit with proposed reforms, some Central Eastern European (CEE) countries may exploit the advantage of constant or lower public pension expenditure in the long-term; they can achieve this by slashing benefits to future retirees. Looking at the South Asian and African countries, they are currently suffering and are expected to continue to suffer from very low adequacy and coverage ratios, despite spending little on public pensions. Finally, in Latin American countries, where privately funded plans predominate, state pension expenditure is unlikely to be a major concern.

In this context, the following suggestions can play a critical role in the future of public pensions in developing countries:

- **Public pension reserve funds**, although currently negligible in size, have significant potential for narrowing the financing gap of state pensions over the long term.
- **The nationalization of private pensions,** despite its positive short-term fiscal effects, should be considered in the light of sustainability and adequacy concerns of public pensions.
- **Notional defined contribution plans,** which combine the advantages of pay-as-you-go (PAYG) and defined-contribution (DC) schemes, may be adopted by developing countries that do not wish to incur the costs of switching from public to private pension arrangements.

The second part of the paper paints a comprehensive picture of private pensions in developing countries, along with analysing the determinants of pension savings—coverage, contribution, and investment performance. Regarding the current status of private pensions in developing countries, the amount of pension assets relative to the size of the economy is relatively large in Latin American countries due to the dominant nature of funded plans. By contrast, the smallest size of pension funds is found in South Asian and African countries, mainly attributable to the low participation and contribution rates in their pension schemes. The only exception in the African region can be considered South Africa, where the amount of

pension assets almost equals the size of its economy. Considering the last decade, CEE countries report the largest increase in their pension fund size.

Several important challenges emerge regarding the low pension savings in developing countries. With respect to the coverage rates and contribution levels, the high share of public pensions, lack of affordability, and labour informality are the most significant problems to be tackled. While the lack of savings ability is a general phenomenon among developing countries, a high proportion of informal employment is a concern mainly for African and Latin American regions and less so for CEE countries. Regarding the investment performance of pension funds, the greater preference for fixed income assets and less reliance on long-term risky securities can be considered the main reasons for low portfolio returns. On the other hand, in some developing countries, such as Turkey, a relatively high level of fees is an important factor in reducing the investment performance of pension funds.

To encourage pension savings, most developing countries have introduced fiscal incentives and financial education tools. However, such traditional policies do not generate sufficient participation and contribution rates, except in some countries, such as the Czech Republic. Due to this fact, developing countries have recently adopted auto-enrolment policies, which have achieved considerable success in promoting pension savings in developed countries. However, while auto-enrolment systems seem to be effective in lowering management fees in private pension plans, high opt-out rates are observed in Chile, Poland, and Turkey. Investigating the reasons behind this limited success again points to the lack of affordability and a high level of informality in developing countries. Moreover, a lack of trust in long-term investment in plan participants highlights the importance of default fund design in auto-enrolment plans.

From the perspective of private pensions, the following suggestions regarding financial, behavioural and technological issues may be of critical importance in developing countries:

Financial:

- **Life-cycle funds** should be designed based on each country's human capital and its riskiness.
- **ESG investments** may serve the diversification purpose of private pensions and can be used in default investment options of auto-enrolment plans.
- **Decumulation phase investment products**, which also consider the accumulation stage of retirement planning, may emerge as low-cost and less risky alternatives to annuities.

Behavioural and Technological:

- **Digital nudging tools**, particularly saving through consumption platforms, have significant potential to increase pension savings among the low-income and informal population.
- **FinTech applications** may provide low-cost portfolio management and financial advisory services for pension plan participants. More importantly, they can fuel the expansion of digital micro-pensions for those excluded from formal pension programs.
- **Blockchain technology** is particularly beneficial in reducing the operating costs of funded pensions and improving transparency, trust, and security of pension schemes. Given the small size of their pension funds, developing countries can construct blockchain infrastructure at a relatively low cost.

Part I. Public Pension Systems in Developing Countries

A key rationale behind state pensions is guaranteeing a minimum standard of living for older people in the poorest segments of society. Accordingly, the healthy functioning of these systems is particularly critical for developing countries, where the old-age poverty rate is twice that of the developed ones, and public pensions account for about 85% of retirement benefits among the lowest income groups (OECD, 2013, 2019c). However, due to the rapid aging process, developing countries are at risk for losing their youth advantage in the long run, forecasting severe problems in the financing and benefit structure of PAYG plans. Against this background, this part of the paper presents the status of public pensions in the developing world, along with an overview of the aging phenomenon, sustainability and adequacy issues, and future directions.

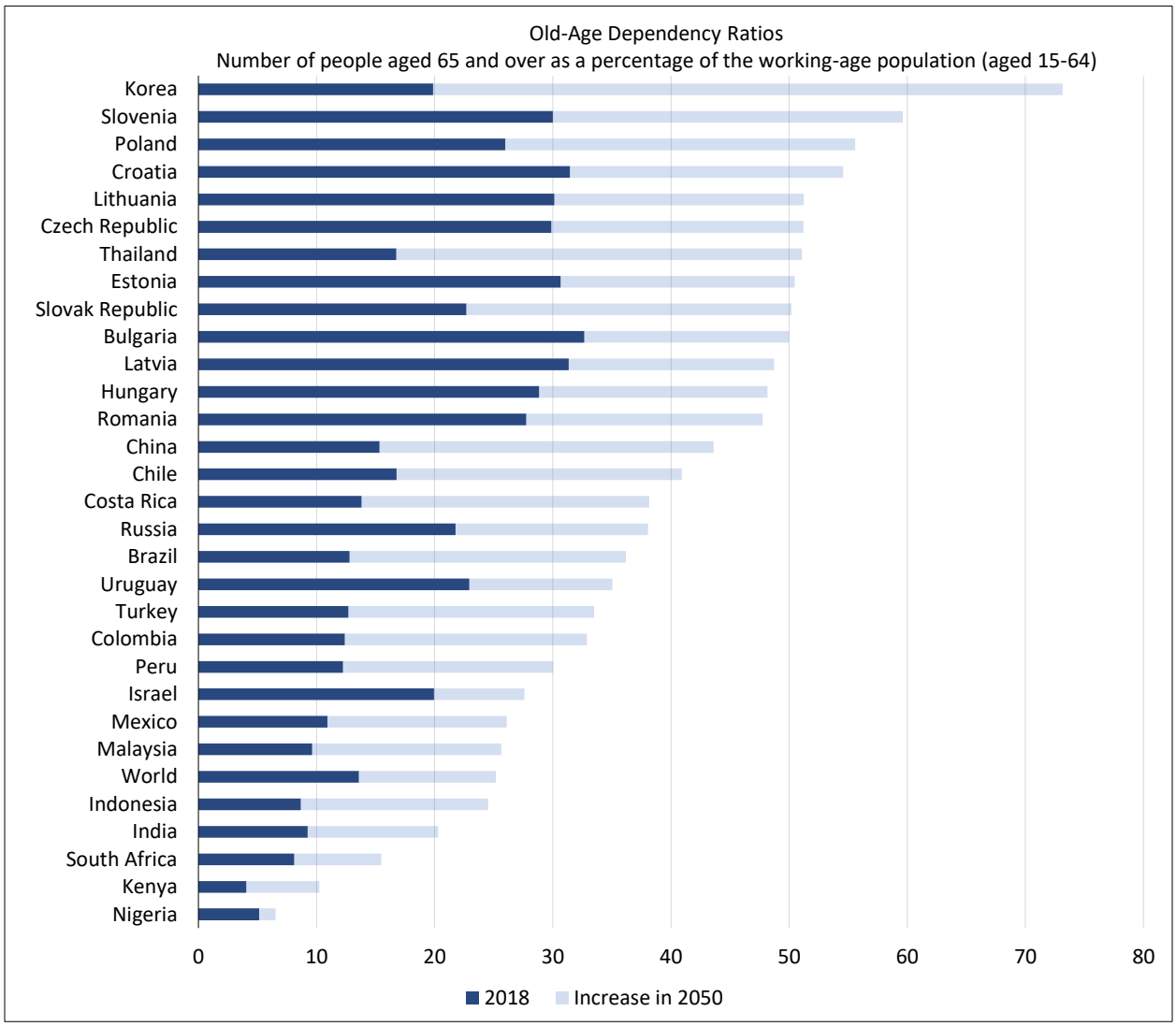
1. Population aging in the developing world

Today, every country in the world is suffering, more or less, from population aging driven by declining fertility and mortality rates. While most studies emphasise the criticality of this trend for developed countries (e.g., Germany, Japan, and the UK), the share of older people in the total population will rise at a faster pace in less developed parts of the world. Despite relatively young demographics, developing countries are expected to shift from younger to older average age within 25 years, whereas a similar process took over 150 years in some of their developed counterparts (The Emerging Markets Symposium, 2015). As a result of this rapid aging, it is estimated that by 2050, two-thirds of the world's older population will reside in developing regions (United Nations, 2015).

To illustrate the aging trends in developing economies, Figure 1 presents old-age dependency ratios (number of elderly relative to the size of working-age population) for the countries of CEE, Latin America, Asia, Middle East, and Africa in 2018 and estimates for 2050. Overall, there is substantial heterogeneity in this measure across developing countries, reflecting the highest growth and value in South Korea (73.2%) and lowest growth and value in Nigeria (6.5%). This level of variation occurs since developing regions differ widely in their stages of the demographic transition from high fertility and mortality to low fertility and mortality.[1] Meanwhile, most CEE countries (e.g., Slovenia, Poland, Croatia, and Lithuania) have already entered or approached the final stage of their demographic process, where older people account for an increasing share of the population. Given that, they are likely to reach higher old-age dependency ratios—about twice the world average—compared to other developing regions. Since most Latin American and Asian states are at an advanced phase in demographic transition; old-age dependency ratios in these countries are projected to amplify by more than two to three times between 2018 and 2050. Only countries in the early stage of demographic change (India and Indonesia) and those at the pre-transition phase (African countries) seem to still benefit from low old-age dependency in the future, particularly due to their favourable fertility profiles.

[1] According to the IMF (2015) classification, there are four main demographic transition phases: i) pre-transition stage, where countries have high fertility levels, however, accompanied by declining mortality rates; ii) early transition stage, where stable or declining fertility rates is associated with falling mortality rates; iii) advanced transition phase, in which shifting from low old-age dependence state to a high old-age dependence state occurs, and iv) late transition phase, where countries experience a decline in their working-age population.

Figure 1. Old-age dependency ratios in developing countries, 2018 and 2050 (%)



Source: The World Bank, 2019. Population Estimates and Projections.

2. Sustainability and adequacy of public pension systems

From the retirement systems' perspective, the rapid increase in the elderly population leads to further deterioration in the main objectives of public pensions[2]—sustainability and adequacy. These two functions are explained below, along with an analysis of current and projected data for developing countries.

Sustainability (also referred to as fiscal sustainability) measures the capability of state pensions to finance retirees' benefits with workers' contributions, without distorting the fiscal balance of governments (European Commission, 2010). As a widely used measure of fiscal sustainability, public pension expenditure as a percentage of GDP for developing countries in 2015–2016 and 2050 is presented in Figure 2. It is worth noting that apart from the aging-related costs, projections for this measure have been

[2] Public pension systems can be unfunded, partially funded, or fully funded. However, in this paper, public pensions refer to unfunded PAYG plans run by the state.

influenced by a number of factors, such as pension policy reforms (e.g., adjustments in retirement age and benefit levels), coverage and maturity of public pension systems, and macroeconomic conditions.

As Figure 2 illustrates, on average, public pension expenditure is expected to spike from 6.7% of GDP in 2015–2016 to 8% of GDP in 2050 across developing countries included in the OECD database. Although, current and projected levels for this measure have been relatively high in most of the CEE countries, the largest growth is expected in Brazil, China, and Korea. According to the estimates for 2050, public pension expenditure will more than double in China and Korea, whereas in Brazil, it is projected to rise from 9.1% to 16.8%, reaching the highest among other developing countries. Considering the fact that public pension expenses account for around one-fifth of the total government spending in developing countries, by 2050, state pension expenditure in Brazil and Slovenia alone will account for over 3% of the public deficit, the maximum level allowed by the Maastricht criteria (OECD, 2019c). While in Korea, expected high growth in public pension spending is not surprising due to the rapid aging process, in China and Brazil, this situation is attributed to the lack of pension reforms (Amaglobeli et al., 2019).[3]

In contrast to the majority of developing regions, long-term public pension spending is expected to decrease or remain constant in some CEE countries. For Poland, Croatia, Estonia, Lithuania, and Latvia, proposed pension reforms, particularly the nationalization of private pensions,[4] are likely to offset the increasing costs of aging. Observing the expenditure on Latin American public pensions, a projected fall in Chile and a slight increase in Mexico can be explained by the fully funded nature of their pension arrangements. In both countries, minimum pensions and recognition bonds are the main costs of public budget related to pensions.[5]

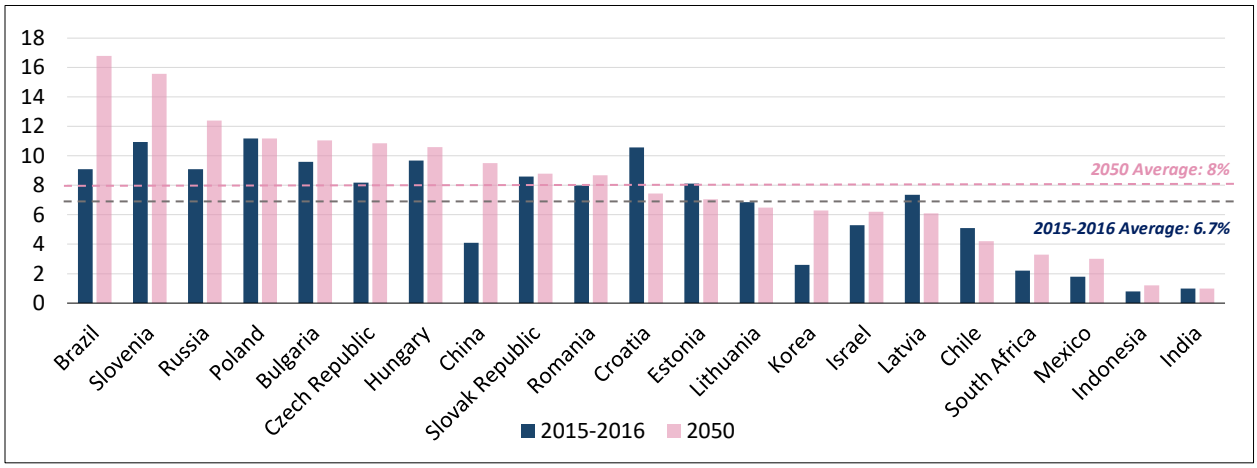
The lowest public pension expenditure is estimated and observed in India and Indonesia, due to the limited coverage of their state pensions. Given the same reason and also taking advantage of its young population, South Africa is likely to witness a slight increase in its public pension spending. One of the main factors underlying low coverage rates (below 10%) in South Asian and African public pensions is the large size of informal employment (Demirgüç-Kunt et al., 2016). This issue also leads to low participation rates in private pensions and will be further explored in the following section.

[3] After 30 years of discussion, as of October 2019, Brazil's government reached an agreement to reform its public pension system and proposed three important adjustments aiming to reduce the public deficit: i) increasing retirement age from 56 to 65 for men and 53 to 62 for women, ii) increasing workers' contributions to the system, and iii) changing the calculation mechanism of pension benefits (OECD, 2019c).

[4] Following the 2008 financial crisis, most CEE countries fully or partially nationalized their private pensions and started to transfer their pension funds' assets to the public PAYG system. Moreover, they also introduced other measures, such as increasing retirement ages, linking pensionable age to average life expectancy, penalizing early retirement, and reducing pensioners' benefits.

[5] After the 2008 pension reform, Chile replaced its poverty protection programs (Minimum Pension Guarantee and PASIS) with a New Solidarity Pillar (NSP), which guarantees a minimum pension income for individuals in 60% of the poorest population (Fajnzylber, 2019). As of 2013, Mexico also introduced a new minimum pension program for those who are older than 65 years and are not qualified for any pension income (OECD, 2013). Also, in Chile and Mexico, one part of public pension spending is attributed to the recognition bonds—they represent the value of benefits for workers who decided to stay in the PAYG system during the transition to private funded DC plans.

Figure 2. Public pension spending as a percentage of GDP in developing countries, 2015-16 and 2050



Source: OECD, 2019c. Pensions at a Glance; European Commission, 2018. Economic & Budgetary Projections for the 28 EU Member States (2016-2070).

Note: Projections for public pension expenditure do not consider pension reforms implemented after 2016.

As indicated above, in public pensions, benefits of retirees are financed through contributions of workers, as long as there is no need for government transfers. However, in the case of a failure in the public PAYG system, the government will also be responsible for paying the remaining benefits of current retirees and pension payouts of current workers that will be rewarded in the future. This obligation refers to an implicit pension debt, and it indicates the present value of benefits that must be paid to current retirees and workers if the public pension system fails to operate for any reason.

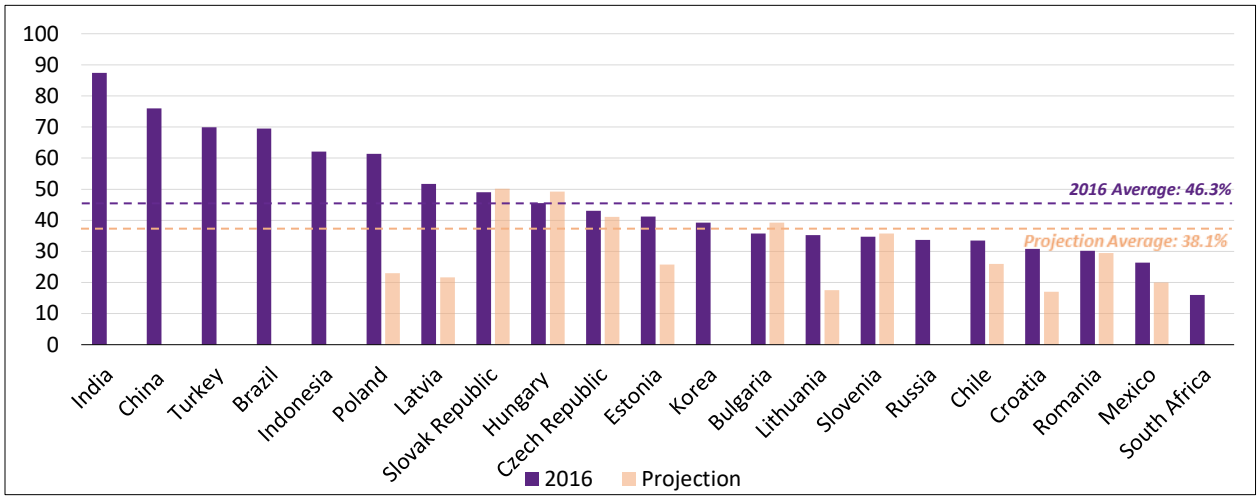
Implicit pension debt is not included in the calculation of government pension spending; however, it is a relevant measure to evaluate the overall fiscal position of public pensions across countries. Since estimations for this indicator are highly sensitive to the different discount rates, research studies may reflect substantially different results. Nevertheless, according to the common findings reported from existing work, most developing countries have higher implicit pension debt than their GDP, except some Latin American ones with fully funded DC schemes.[6] Specifically, due to the high-aging related costs, the largest implicit pension debt is observed in CEE countries, varying from 200% to 400% of the GDP (Holzmann et al., 2004; Eichhorst et al., 2011).

Another important objective of public pensions is **adequacy**, which reveals how successful PAYG plans are in providing the same standard of living for pensioners compared to their pre-retirement period (OECD, 2020b). To indicate the adequacy of public pension systems, Figure 3 shows current and estimated gross replacement rates[7] (the ratio of retirees' benefits to workers' salary) for average income earners in developing countries. Due to the lack of data, projections for replacement rates are presented for some Latin American and CEE countries in 2065 and 2070, respectively.

[6] There is no implicit pension debt for funded DC systems since each generation is responsible for financing their own retirement.

[7] The calculation of replacement rates in gross terms, as opposed to net terms, does not include taxes and social security premiums paid by pensioners and employees.

Figure 3. Gross pension replacement rates in developing countries, 2016 and projections (%)



Source: OECD, 2017b. Pensions at a Glance; European Commission, 2018. Economic & Budgetary Projections for the 28 EU Member States (2016-2070); Flamini et al., 2018. Growing Pains: Is Latin America Prepared for Population Aging?

Note: Replacement rates are based on public pensions in all countries, except Chile and Mexico. In the calculation of the projection average, current replacement rates are used for countries that do not have long-term estimates.

As illustrated in the figure, on average, gross replacement rates in developing countries are expected to decline from 46.3% in 2016 to 38.1% in the years projected. Noticeably, India, China, Turkey, Brazil, and Indonesia have the highest replacement rates between 60–90%. Here, it is worth noting that providing high replacement rates is not always optimal if the system allows participants to retire at very early ages. For example, in Brazil, civil servants could receive approximately 80% of their salaries during retirement by staying in the pension system for five years (Mitchell & Fields, 1996). Likewise, in Turkey, due to the early retirement regulation between 1992–1999, employees were able to leave their jobs in their 30s with very high replacement rates.[8] (Brook & Whitehouse, 2006). As a result of these incentives, the Brazilian and Turkish governments faced high pressures on their fiscal balance. Since this problem is also prevalent in other developing countries, it would be better to set eligibility conditions for retirement based on pensioners' age, rather than contribution amounts or periods.

Reviewing the projections in detail, most countries are likely to have replacement rates below 40% in the future, which is the minimum ratio defined by the European Code of Social Security (ECSS) and the International Labour Organization (ILO), to protect retirees from old-age poverty (Schoukens, 2016). Compared to the levels of 2016, Poland, Latvia, Estonia, Lithuania, and Croatia seem to sacrifice retirees' income in favour of low public pension spending in the future. Only the Slovak Republic, Hungary, Bulgaria, and Slovenia expect a slight increase in the level of replacement income. While Korea has a moderate replacement rate close to 40%, due to the rapid aging process in the country, the government may decrease retirees' benefits in the future. Moving to countries in Latin America, they are likely to reduce replacement rates to expand coverage in guaranteed minimum pensions among the lowest-income groups.

[8] Turkey has the lowest retirement age among OECD countries, despite some amendments in recent years.

South African public pensions offer the lowest level of replacement income across developing countries. The adequacy of public pensions has always been a concern in South Africa, mainly due to the low contribution rates in the system and early withdrawal of accumulated savings by workers in the case of job changes. To counteract this situation, the South African government should implement regulations encouraging workers to stay in the system as long as possible (Department of Social Development, 2012).

As it turns out, public pension systems in developing countries will strive more to strike the right balance between sustainability and adequacy. While some CEE countries (Poland, Croatia, Estonia, Lithuania, and Latvia) that implemented pension reforms seem to benefit from lower or constant public expenditure, they will accomplish this by cutting benefits for future generations. By contrast, other CEE countries (Slovenia, Bulgaria, the Czech Republic, and Hungary) will be challenged with fiscal sustainability, but with low or no sacrifices from the adequacy component. Looking at the Asian countries, India and Indonesia currently have high replacement rates accompanied by the public pension spending at only around 1% of their GDP. However, this situation mainly stems from the limited coverage rates in their state pensions. While Chile and Mexico are expected to have a lower replacement income in the future, public pension expenditure is unlikely to be a major issue in these countries. Finally, the South African pension system is currently suffering from very low replacement and coverage rates, despite low spending on public pensions.

3. Future directions for public pensions

Last but not the least, of course, there are other issues to address in public pensions, such as the labour informality and the role of technology. Since these topics are of mutual importance for public and private pension systems, they will be mentioned in the next section. Nevertheless, the potential suggestions that may shape the future of state pensions are briefly discussed below.

- **Public pension reserve funds (PPRFs):** Despite existing in various forms (e.g., social security stabilization funds, demographic reserve funds, and sustainability funds), PPRFs are established by governments primarily to reduce the financing gap in PAYG plans. The total assets of PPRFs in OECD countries almost doubled in the last decade, increasing from USD 4 trillion in 2007 to USD 7.5 trillion in 2017. Looking at the developing countries (e.g., Chile, China, Mexico, Poland, and Russia), however, their importance is still limited, with total assets to GDP ratio accounting for less than 5% (Yermo, 2008; OECD, 2019d).[9] If PPRFs achieve considerable scale in developing countries, they can play a critical role in reducing the fiscal deficit of public pensions.

- **Nationalization of private pensions:** Following Chilean reform, many Latin American and CEE countries also privatised their pension systems in the late 1990s and 2000s. While some of these countries (e.g., Bolivia, Chile, El Salvador, and Mexico) entirely replaced their public pensions with private ones, most CEE countries (e.g., Estonia, Hungary, Lithuania, and Poland) preferred to introduce private pensions as a complementary second pillar system. With the global financial crisis of 2008, however, most CEE countries suffered from large public deficits. Moreover, substantial low returns in bonds and equities eroded the accumulated savings of participants in

[9] One of the exceptions in developing countries is Korea's 'National Pension Fund', where its assets account for 34% of GDP.

funded pension systems. Therefore, subsequently, more than half of the countries that adopted private pensions decided to transfer their DC assets to public PAYG plans.

Indeed, short-mid-term effects of this nationalization process in CEE countries seem to have positive results with reduced fiscal expenditure, lower administrative costs, and higher pension benefits compared to old private pension systems (Ortiz et al., 2018). On the other hand, sustainability and adequacy concerns for PAYG schemes in the long-run raise question marks over the implementation of this reform in other developing countries.

- **Notional defined contribution (NDC) plans:** The NDC scheme is a type of public pension system, which shares the features and advantages of both PAYG and DC plans. On one hand, as in PAYG systems, current workers' contributions are used to finance current retirees' benefits. On the other, like in DC plans, participants have individual accounts, where their benefits are directly linked to their contributions. However, differently from pure DC schemes, these personal accounts are notional and do not invest workers' contributions into financial assets. Instead, the rate of return on contributions—notional return—is determined by the government. During retirement, pensioners receive their accumulated savings in the form of annuities.

  There are several potential advantages of NDC schemes over traditional PAYG plans. Firstly, NDC plans offer better sustainability in the long run since governments do not have to cover pensioners' benefits in the case of inadequate final savings. Secondly, economic, and demographic changes in countries can be immediately reflected in the retirees' income.[10] Thirdly, each additional contribution in NDC plans corresponds to a proportional rise in benefits, motivating employees to work and stay in the system longer. Finally, administration costs in NDC plans are lower due to the simplified recordkeeping of pension accounts.

  Alongside the advantages mentioned above, NDC schemes allow for maintaining inter-and intra-generational redistribution of PAYG systems[11] (Blake, 2009; Holzmann et al., 2012). Interestingly, despite its attractive features, only five countries in the world fully apply the NDC approach, namely Italy, Latvia, Norway, Poland, and Sweden. Nevertheless, the experiences in these countries are overall positive, and thus NDC plans can be considered an alternative to traditional PAYG schemes. This system may be particularly advantageous for developing countries, which do not want to replace their existing PAYG arrangements with funded DC plans, due to the high transition costs.

[10] In NDC plans, the indexation of notional returns is usua lly based on countries' economic or wage growth. Hence, the rate of return in the system automatically increases/decreases relative to the changes in the economic environment. Moreover, any increase in life-expectancy automatically reduces the size of regular payments.

[11] Public PAYG systems provide both 'intergenerational' and 'intragenerational' redistribution. While the former principle refers to the redistribution of retirement income from young to the old generation (e.g., current workers' contributions finance current retirees' benefits), the latter one implies that, within the same generation, pension benefits are redistributed from rich to poor people (e.g., high-income earners have to contribute relatively more than low-income earners to receive the same level of pension benefits). These features may also be added to the NDC plans.

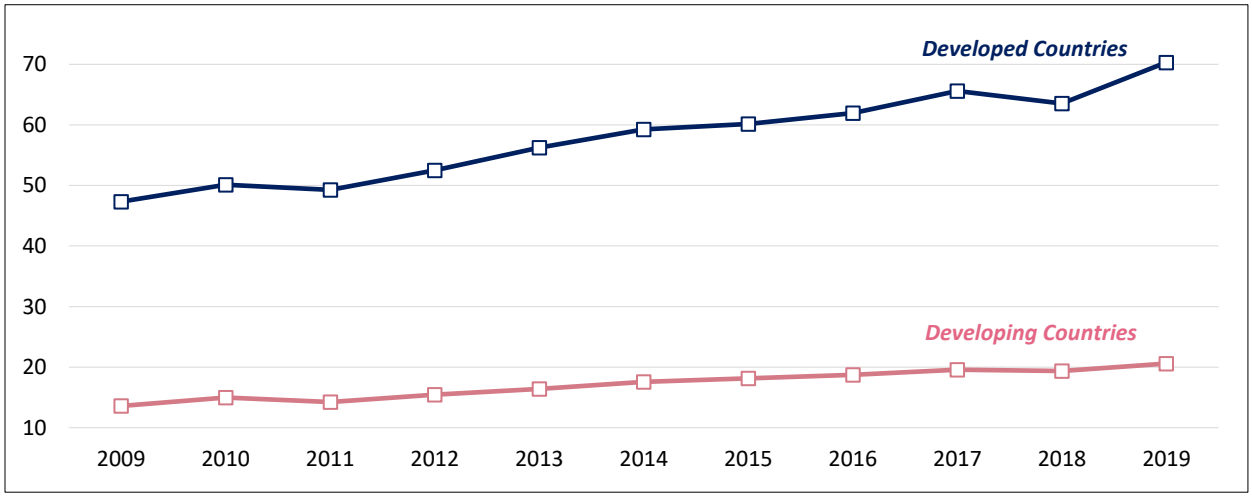
Part II. Private Pension Systems in Developing Countries

Given the picture presented above, it can be observed that most developing countries implement changes to the state pension parameters (e.g., increasing the retirement age or cutting pension benefits) to ensure the sustainability and adequacy of their PAYG plans. Indeed, as an alternative to these reforms, private and funded pensions may help to decrease the fiscal burden of governments and at the same time, generate additional old-age income for pensioners. Beyond their social contribution, pension funds are also beneficial to countries' financial and macroeconomic development. As shown by previous studies, pension funds may have a positive impact on capital markets (Walker & Lefort, 2002; Rocholl & Niggeman, 2010), financial stability (Bohl et al., 2009; Thomas et al., 2014; Han et al., 2018), and macroeconomic development (Murphy & Musalem, 2004; Bijlsma et al., 2018).

1. The current status of pension funds

Interestingly, despite their positive social, financial, and economic features, the size of pension funds is relatively small in developing countries compared to developed ones. As illustrated in Figure 4, between 2009 and 2019, pension fund assets to GDP ratio increased from 47.3% to 70.3% on average in developed countries, and from 13.6% to 20.6% in developing countries. Notably, only in the years 2011 and 2018, there was a decrease in the size of pension funds in both regions. While low returns on bonds led to a decrease in the portfolios of many European pension funds in 2011 due to the Sovereign Debt Crisis, the very poor investment performance of major stock market indices contributed to the decline in pension fund assets in 2018, particularly in developed countries (e.g., the US, UK, and Canada).[12]

Figure 4. Pension fund assets as a percentage of GDP in developed and developing countries, 2009-19



Source: OECD, 2020a. Pension Markets in Focus.

Note: Developing countries include Brazil, Bulgaria, Chile, China, Colombia, Croatia, Czech Republic, Estonia, Hungary, Indonesia, Kenya, Korea, Latvia, Mexico, Nigeria, Peru, Poland, the Slovak Republic, Slovenia, South Africa, Thailand, and Turkey. Developed countries include Australia, Austria, Belgium, Canada, Finland, France, Germany, Iceland, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the UK, and the US.

[12] In 2018, the US S&P 500 and UK FTSE 100 stock market indices experienced their largest declines since the 2008 financial crisis with negative returns of 6.24% and 12.5%, respectively (Mashreq Private Banking, 2019).

Table 1 provides a detailed picture of the size of pension funds in developing countries in 2009 and 2019. As shown, South Africa and Chile have a relatively high share of pension fund assets relative to their GDP (95.1% and 80.8%, respectively) since there is a long history of mandatory pension systems in these countries. The origins of funded pensions in South Africa date back to the Pension Funds Act of 1956 when the first mandatory occupational schemes were introduced for formal employees in the private sector. Similarly, in 1981, Chile fully privatised its public pension system by introducing mandatory personal DC plans.

Table 1. Pension fund assets as a percentage of GDP in selected developing countries, 2009 and 2019

Country	2009	2019
South Africa	74.7%	95.1%
Chile	61.8%	80.8%
Croatia	9.2%	30.0%
Korea	8.5%	28.2%
Colombia	13.4%	26.7%
Brazil	18.9%	26.2%
Peru	18.9%	22.6%
Mexico	12.6%	18.5%
Estonia	8.2%	18.5%
Latvia	6.0%	16.7%
Bulgaria	4.3%	13.6%
Kenya	11.0%	12.9%
Slovak Republic	6.2%	12.6%
Czech Republic	5.5%	8.8%
Poland	13.3%	8.0%
Thailand	5.3%	7.3%
Slovenia	4.9%	7.3%
Nigeria	3.4%	7.0%
Hungary	12.9%	5.4%
Turkey	0.9%	2.9%
China	0.7%	1.9%
India	-	1.9%
Indonesia	1.8%	1.8%
Malaysia	-	0.2%

Source: OECD, 2020a. Pension Markets in Focus.

Due to their private pension reforms in the 1990s, Latin American countries have relatively large pension fund assets compared to other regions. Following Chile, Mexico substituted its PAYG system entirely with private pensions, whereas Colombia and Peru introduced private mandatory pension plans as a complementary pillar. On the other hand, Brazil adopted a different approach by offering occupational and personal pension arrangements based on voluntary participation.[13]

Asian and African countries, however, have lower private pension fund assets compared to Latin America and CEE regions. In fact, instead of private pensions, these countries (e.g., India, Indonesia, Malaysia, Kenya, and Nigeria) rely heavily on provident funds in the provision of retirement income. Provident funds can be described as national mandatory savings plans that are established and managed by the

[13] Indeed, Brazil introduced the first regulations related to private pensions in 1977, i.e., before Chile. However, pension fund assets started to grow significantly after the 2001 legislation, which made occupational pensions more attractive by introducing several incentives, such as the removal of income tax on investment returns.

government. All rules and regulations about these plans, such as asset allocation decisions, fee structure, and provision of pension benefits, are determined by the government.

Notably, Turkey, China, India, Indonesia, and Malaysia have the lowest ratio of pension fund assets to GDP (below 3%) among developing countries. In fact, in order to increase the importance of pension funds in the economy, Turkey implemented the auto-enrolment program in 2017. However, the system is quite new, and its overall impact should be measured in the long run.

Over the last decade, most of the CEE countries have witnessed more than two times growth in the size of their pension fund assets. This large growth is attributed to the introduction of private occupational pensions with mandatory participation in these countries during the early 2000s. Evidently, only Hungary and Poland experienced a decrease in their pension fund size from 2009 to 2019. As mentioned in the previous section, these countries have transferred their assets from DC schemes to public PAYG plans due to the nationalisation process. On the other hand, instead of terminating existing private accounts, most CEE countries preferred to reduce the contribution rates in their private pension systems. Therefore, they were able to record a respectable growth in their pension fund size during the last decade.

The low level of pension savings in developing countries also implies the limited adequacy of their private pension plans. For example, on average, in China, India, Korea, Latvia, and Turkey, private pensions do not contribute to additional old-age income for pensioners. On the other hand, even in countries with predominant funded systems (e.g., Chile and Mexico), private pensions provide about 20–30% of the replacement income in retirement. Among developing countries, South Africa can be considered as an exception where the gross replacement rate of private pensions is about 50% (OECD, 2017b).

Several reasons behind low pension savings in developing countries emerge, which can be explained by the issues of coverage, contribution, and investment performance. These three factors are examined below, along with an analysis of the different features of developing countries compared to developed ones.

2. The determinants of private pension savings

2.1. Coverage

Before examining the reasons for low pension participation in developing countries, it is useful to look at the coverage rates for different types of pension plans. In this regard, Table 2 illustrates the coverage of mandatory and voluntary pensions as a percentage of the working-age population (15–64 years of age) in developing countries. Taken as a whole, it can be observed that while the rates of participation in compulsory plans are considerably higher than those in voluntary pensions[14], they are still far from full coverage.

Both Latin American and CEE countries that adopted mandatory pensions have coverage rates at or above 65%, except Turkey, Peru, and Colombia. In Turkey, the majority of compulsory pension savings are

[14] It is also worth noting that developed countries present a similar picture regarding the participation type of pension plans. Countries that adopted compulsory pension plans (e.g., Australia, Finland, Netherlands, and Sweden) have relatively high coverage rates for their private pensions compared to their voluntary counterparts.

attributed to the second pillar scheme called OYAK. However, this plan has limited participation rates since it offers pension benefits only for military personnel. In the case of Peru and Colombia, the high level of informal employment can be considered as the main reason for low pension coverage.

Table 2. Coverage of private pension plans as a percentage of the working-age population

Country	Mandatory	Voluntary
Chile	87.9	NA
Czech Republic	x	64.1
Estonia	88.2	11.1
Bulgaria	85.1	14.3
Hungary	x	18.4
Israel	80.2	NA
Latvia	~100	21.0
Mexico	68.1	1.9
Poland	x	66.4
Slovak Republic	x	41.9
Turkey	1.5	12.7
Brazil	x	10.9
Indonesia	NA	1.5
Russia	79.1	4.8
Uruguay	64.7	NA
Peru	34.4	NA
Colombia	51.2	NA
Costa Rica	78.4	4.6
El Salvador	77.4	NA
Namibia	x	15.9

Source: AIOS, 2019. Periodic Statistics; OECD, 2020a. Pension Markets in Focus.

Note: 'NA' = Not available; 'x' = Not applicable; '~' = Approximately. Data for voluntary pensions refer to the personal schemes for all countries, except Mexico and Russia.

In the case of voluntary pension schemes, most developing countries except Poland and the Czech Republic have low private pension coverage. In Poland, the second pillar pension scheme was mandatory until 2014, i.e., before the nationalisation process. Therefore, the coverage rate continues to remain high due to the existing members of the old system. On the other hand, in the case of the Czech Republic, high coverage rates for voluntary pensions can be explained by the generous financial incentives (e.g., tax incentives and state subsidies).

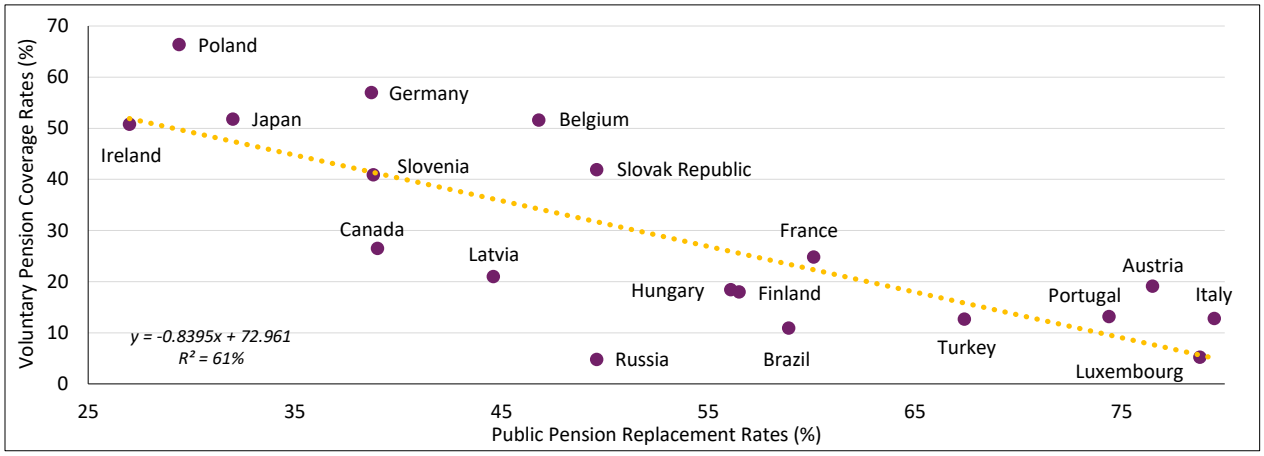
The main reasons behind low pension participation in developing countries include the high share of public pensions, lack of affordability, and informal employment.

High share of public pensions

As noted in previous studies, participation in voluntary pension plans tends to be low in countries where retirees have relatively high public pension benefits (Antolin, 2008; European Commission, 2019). To illustrate this trade-off, Figure 5 shows the gross replacement rates in public PAYG plans and the coverage rates for voluntary pensions in selected countries. Overall, there is a strong negative relationship between the importance of public pensions and the rates of participation in voluntary plans with a correlation coefficient above 75%. As illustrated, countries with the highest public pension replacement rates (Austria, Italy, Luxembourg, Portugal, and Turkey) have voluntary pension coverage less than 20%. On the other

hand, for countries where public pensions have the lowest importance (Germany, Japan, Ireland, and Poland), the level of coverage in voluntary plans are high at above 50%. In the case of Belgium and the Slovak Republic, the importance of public and private pensions can be considered to be half/half.

Figure 5. Public pension replacement rates and voluntary pension coverage in selected countries (%)



Source: OECD, 2019c. Pensions at a Glance; OECD, 2020a. Pension Markets in Focus.

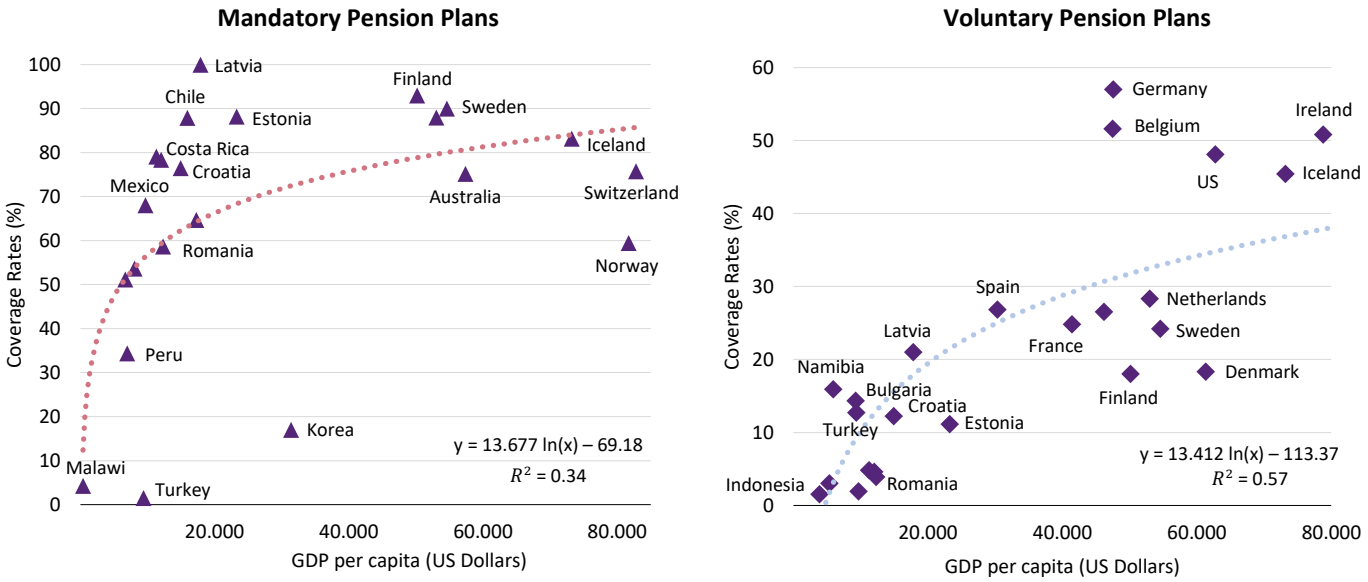
Lack of affordability

Another important factor that affects the decisions related to participation in retirement plans is the level of income (Holzmann et al., 2009). In this regard, Figure 6 shows the correlation between GDP per capita and coverage rates for the mandatory and voluntary pension plans of selected countries in 2018. Apparently, due to their low GDP per capita, developing countries tend to have lower participation rates in both types of pension plans compared to developed countries.

In the case of mandatory schemes, the correlation between coverage rates and the GDP per capita is about 0.60. While countries with a GDP per capita above $50,000 (Australia, Finland, Iceland, Sweden, and Switzerland) have coverage rates that are higher than 70%, such levels of participation are rarely observed in developing countries. Taking advantage of the low informality in their economies, only some CEE countries (Croatia, Estonia, Latvia) have ensured coverage rates that are close to that of developed countries.

The effect of income level on coverage rates is more pronounced in the case of voluntary pension plans with a correlation coefficient of about 0.75. Indeed, in most countries, voluntary schemes are introduced to complement existing mandatory pension plans. Therefore, people with moderate to high income levels are more likely to participate in voluntary pensions on top of their mandatory arrangements. While countries with low GDP per capita (up to $20.000) have limited coverage rates (below 20%) in voluntary plans, wealthy developed countries (Belgium, Germany, Iceland, Ireland, and the US) have higher coverage rates for voluntary pensions, ranging between 40–60%.

Figure 6. Coverage rates for private pension plans and the GDP per capita in selected countries



Source: AIOS, 2019. Periodic Statistics; World Bank, 2019. World Development Indicator; OECD, 2020a. Pension Markets in Focus.

Informal Employment

Evidently, mandatory pension plans achieve higher coverage rates compared to voluntary schemes. However, even if mandatory participation is the status quo, some developing countries may suffer from low participation rates in their private pensions. This reality can be explained by the high level of informal employment, which in turn leads to limited coverage in both public and private pensions.

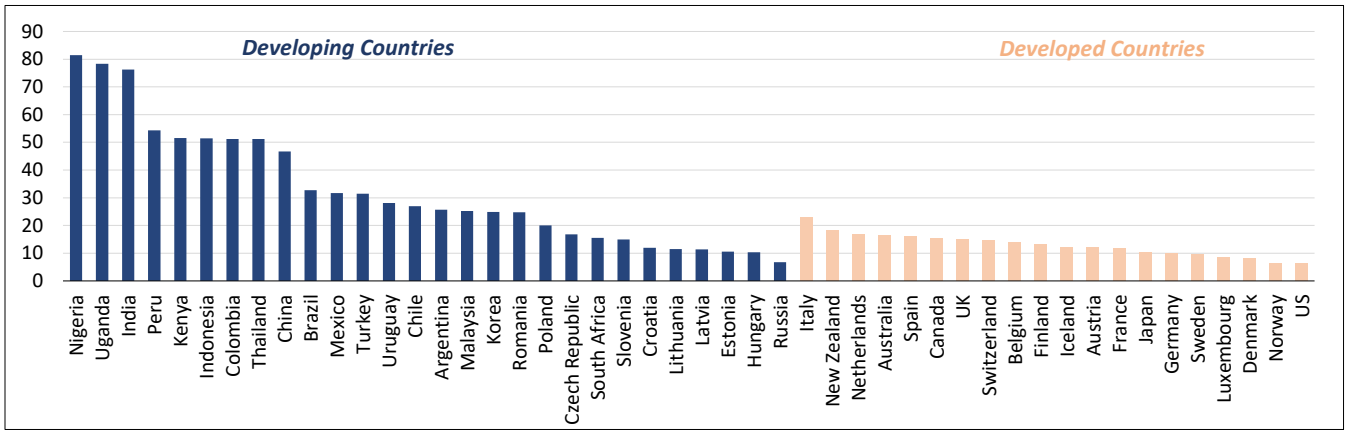
Despite the varying definitions of informality, according to the OECD study by Jütting and De Laiglesia (2009), 'Informal employment refers to jobs or activities in the production and sales of legal goods and services which are not regulated or protected by the state.' The key categories of informal employment include employees without social security or formal employment contracts, own-account workers (self-employed), and unpaid family employees. Among these categories, self-employment accounts for about 60% of the total informal employment in developing countries and, therefore, can be considered as a good indicator that can capture the degree of informality in those regions (Bonnet et al., 2019).

Figure 7 shows self-employment as a percentage of total employment in selected developing and developed countries. As illustrated, almost all developing countries suffer, more or less, from high informality rates compared to developed regions. While the highest ratio of self-employment is observed in some African countries at around 80%, South Africa is an exception in this region. Despite its high unemployment rates, South Africa has a relatively small share of the informal economy compared to other African countries primarily due to its strong and well-integrated formal sector.[15] Following Africa, Latin American and South Asian countries also have high self-employment rates ranging from 25% to 75%. Only CEE countries enjoy low rates of informality at around 10-15%. On the other hand, the share of self-

[15] Other reasons behind the low informality rates in South Africa include the barriers to entry into the informal sector, such as lack of government support, restrictions in labour legislation, lack of access to start-up capital, poor access to credit, and regulatory constraints for the development of small enterprises (Kingdon & Knight, 2001; Cichello et al., 2011).

employment is relatively small in developed countries; the highest ratio is observed in Italy (23%), and the lowest ratio is observed in the US (6%).

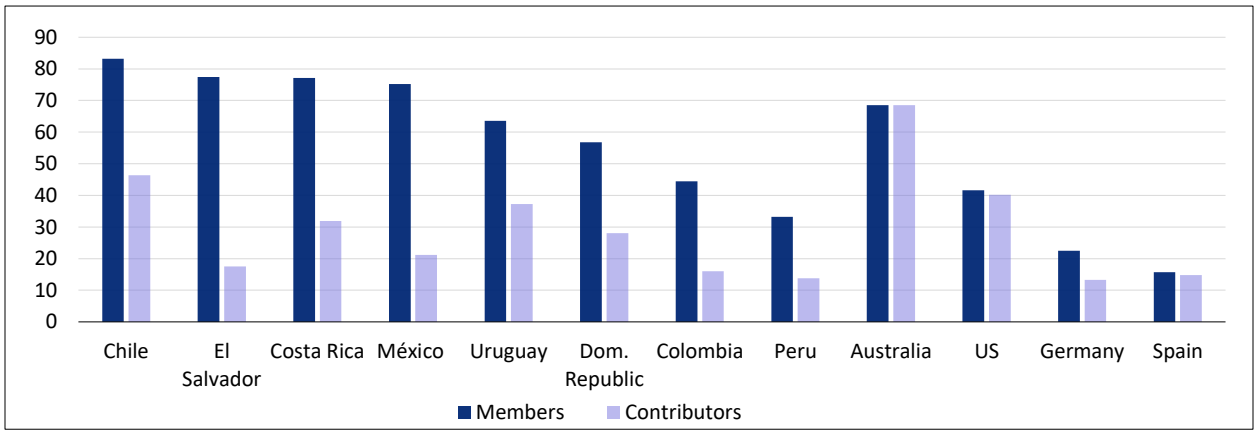
Figure 7. Self-employment as a percentage of total employment in developing and developed countries



Source: ILO, 2019. ILOSTAT Database.

Up to this point, the coverage rate is defined as the number of members who are enrolled in pension plans. However, in the case of high informality, even members who are compulsorily enrolled in pension plans may not be able to contribute regularly. In order to better gauge the impact of informality on participation levels, Figure 8 briefly summarises the gap between members and contributors in private pension plans of developing countries where the data are available. As illustrated, the difference between the ratio of affiliates and contributors is considerably high in Latin American countries, notably due to the large share of informal markets. In Chile, about half of the members are regular contributors, whereas less than one-third of the affiliates regularly contribute to the private pension system in El Salvador, Mexico, and Colombia. Even in Uruguay, which has the smallest difference between members and contributors, coverage rates drop from 63% to 37%. On the other hand, in developed countries, the difference between affiliates and contributors is negligible except in the case of Germany.

Figure 8. Members and contributors in private pensions as a percentage of the working-age population



Source: OECD, 2012. Pensions Outlook; AIOS, 2019. Periodic Statistics; World Bank, 2019. Population Statistics.

Note: Data for Chile, El Salvador, Costa Rica, Mexico, Uruguay, Dominican Republic, and Peru refer to 2018. Data for Colombia refer to 2017. Data for Australia, Germany, Spain, and the US refer to 2012.

2.2. Contribution

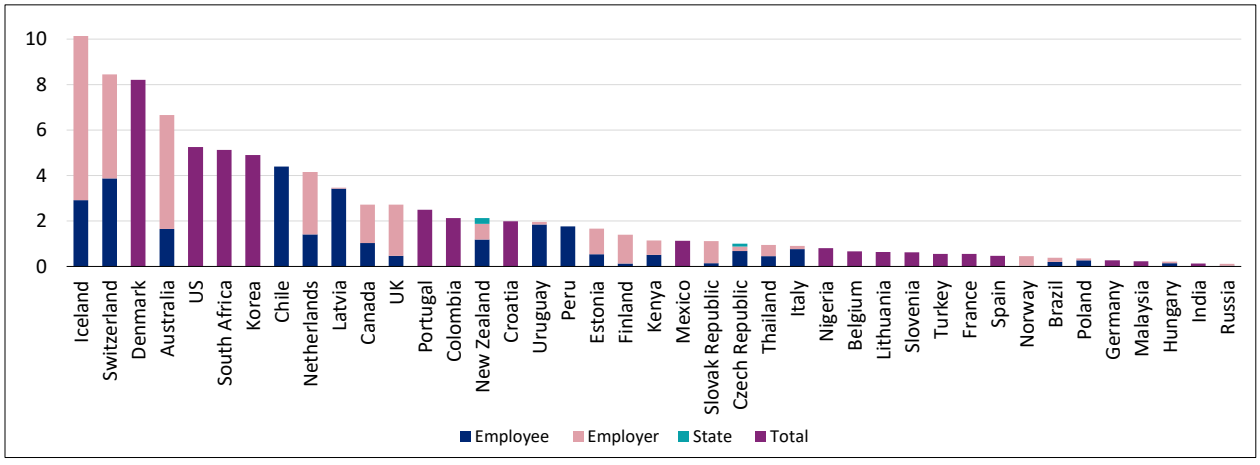
Contribution rates

Apart from individuals' decisions concerning participation in retirement plans, another important determinant of pension savings is the level of contributions. Figure 9 presents a breakdown of the total contributions from employees, employers, and the state for selected developing and developed countries in 2019. It is important to note that this figure presents contribution rates as a percentage of GDP rather than as the proportion of wages in order to evaluate the importance of contributions relative to the economy. Due to the lack of data, only the total contribution rates are reported for certain countries.

Three patterns seem to emerge from this figure. First, developed countries have relatively high contribution rates compared to developing ones. While the average contribution rate in developed countries is 3.4% of the GDP, this ratio is only 1.6% for developing countries. Second, while employer contributions account for the majority of the total contributions in developed countries, employee contributions are the main and, in general, the only source of financing in developing countries. Third, state contributions are negligible compared to employee and employer contributions for all countries in the sample.

By looking at the figure in detail, it can be observed that the highest contribution rate is that in Iceland at above 10% and the lowest is in India and Russia, accounting for a negligible amount of their GDP. Compared to other developing countries in the sample, South Africa, Korea, and Chile have relatively higher contribution rates that are more than 4% of their GDP. Indeed, this reality can partly explain the large pension fund size in South Africa and Chile as mentioned above. Looking at the benefits provided by employers in developing countries, the largest amount of contributions is found in Estonia, Kenya, and the Slovak Republic at approximately 1% of their GDP. However, the amount of state contributions relative to the economy is almost non-existent for all countries in the sample, except New Zealand and the Czech Republic. As discussed above, due to the high level of contributions and financial incentives provided by the state, the Czech Republic has respectable coverage rates in its private pension system.

Figure 9. Contribution rates as a percentage of GDP in selected countries, 2019



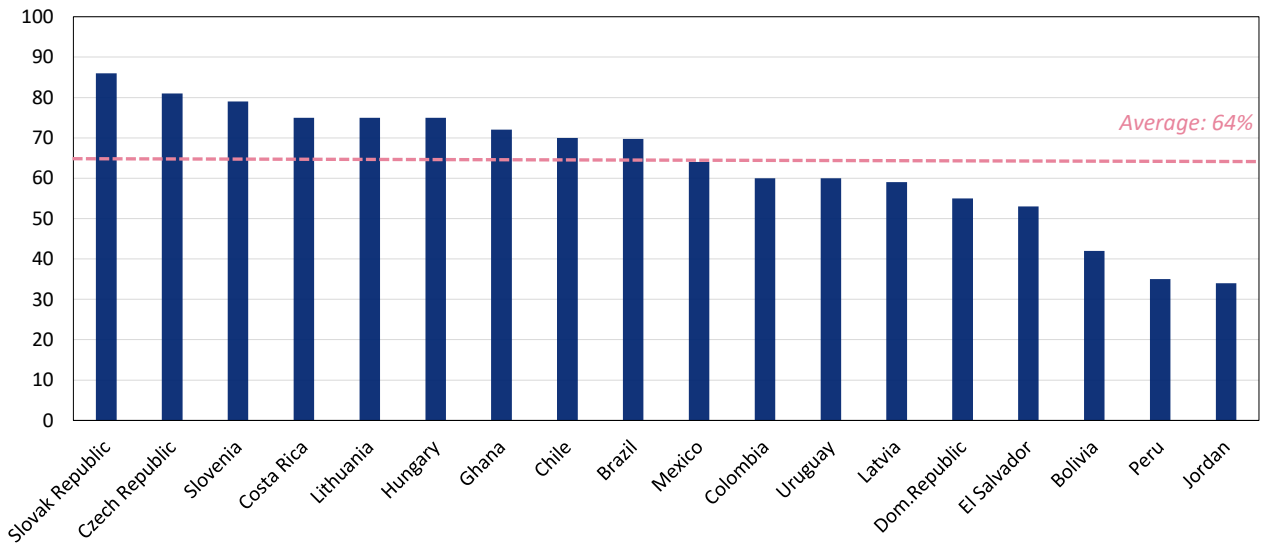
Source: OECD, 2020a. Pension Markets in Focus.

Contribution density

Contribution rates can partially give an idea about the total flow of contributions into pension plans. However, due to the reasons mentioned above (e.g., low-level of income and labour informality), it is difficult to maintain long and regular contribution periods for pension participants in developing countries. In this regard, contribution density can be considered to be another important determinant of the total level of savings, notably in developing countries. Essentially, this measure indicates the average number of months for which a pension participant makes regular contributions per year during his/her working life.

Figure 10 shows the contribution densities of pension members in developing countries where the data are available. Overall, the average contribution density is 64% in selected developing countries; in other words, participants in pension plans contribute, on average, for approximately 7.5 months per year throughout their working life. Indeed, despite the mandatory structure of the pension plans analysed in the sample, contribution densities are far below 100%. For example, due to the high level of informal employment, most Latin American countries have contribution densities under 70%, and the lowest ratio is found in Peru at 35%. Due to a similar reason, pension members in Jordan have a contribution density of 34% on average. By contrast, the highest contribution lengths are observed in CEE countries where the level of informality is low.

Figure 10. Contribution density in private and public pension plans in developing countries (%)



Source: Forteza & Mussio, 2012. Contribution Densities and Transitions in Social Security: The Case of Jordan; Afonso, 2015. Progressivity and distributive aspects of Brazil's social security system: an analysis using microdata from administrative records; Marques & Honorati, 2016. Ghana: Social Protection Assessment and Public Expenditure Review; Flamini et al., 2018. Growing Pains: Is Latin America Prepared for Population Aging?; Holzmann et al., 2019. Progress and Challenges of Nonfinancial Defined Contribution Pension Schemes.

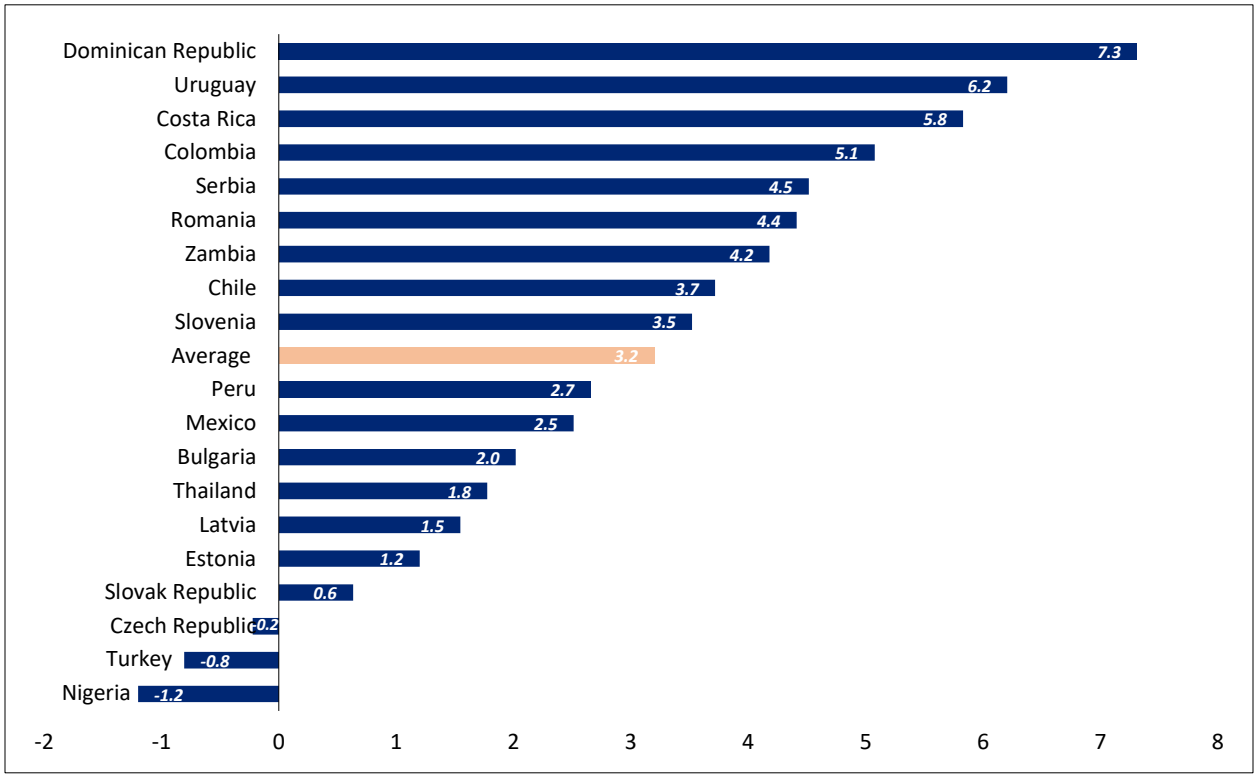
Note: Contribution densities are calculated based on data for private pension plans in Latin American countries. For all other countries, calculations are based on public PAYG systems due to the availability of data.

2.3. Investment performance

In addition to coverage and contributions, investment performance is a critical determinant of the total pension savings. Indeed, risk-adjusted measures may be more effective in evaluating the performance of pension funds than simple return metrics. However, a comparison of these measures across countries may not be sufficiently informative due to the differences in risk-free rates, portfolio composition across different asset classes, and other risk elements, including risks related to exchange rate and interest rate, which are specific to each country (Hinz et al., 2010). Therefore, annualised real return measures based on relatively long horizons may be useful to illustrate the overall investment performance of pension funds across developing countries.

Figure 11 shows a ten-year real geometric average of investment returns in private pension funds for the 2009–2019 period. Except for the Czech Republic, Turkey, and Nigeria, all developing countries have displayed positive annualised real returns in the last decade. Despite a respectable average of annualised real return at 3.2%, there is substantial heterogeneity in the investment performance of pension funds, which ranges from 7.3% in the Dominican Republic to –1.2% in Nigeria. In general, Latin American countries have reached relatively high investment returns, compared to most of the CEE and Asian countries in the sample.

Figure 11. 10-year annualised real returns in private pensions in developing countries, 2009-19 (%)



Source: OECD Global Pension Statistics.

Note: Real returns are net of investment expenses.

Two important factors affect the investment performance of pension funds – asset allocation and management fees. They are explained below.

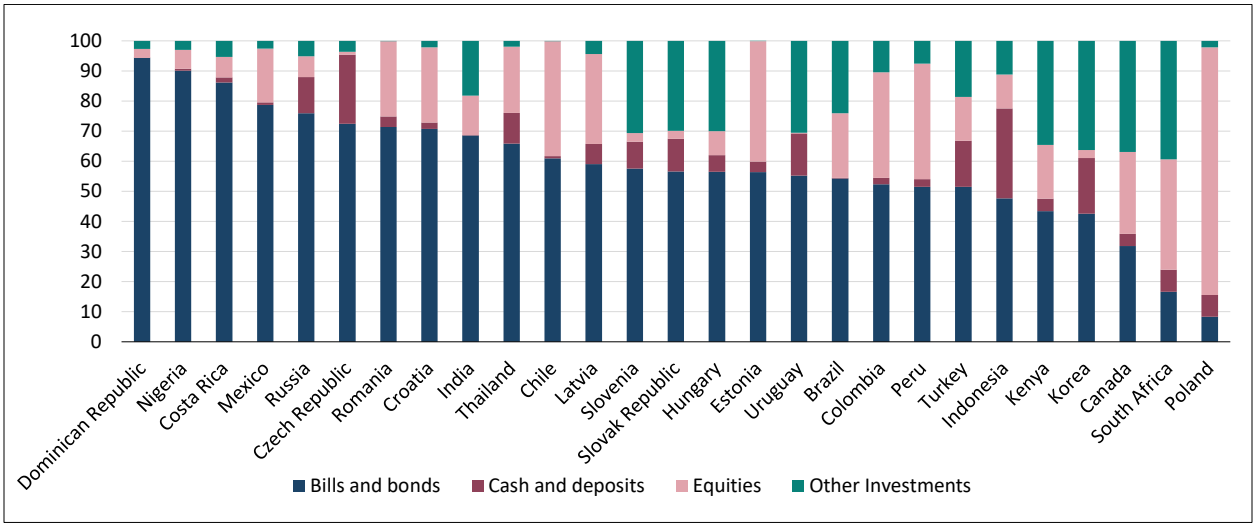
Asset allocation

Asset allocation decisions in pension plans can be made either by plan sponsors or members. However, while investment risk is solely borne by plan sponsors such as employers, pension companies, and governments in the case of defined-benefit plans, losses in fund portfolios belong to the participants in the case of DC schemes.

Figure 12 shows the breakdown of the pension assets of selected developing countries in 2019 into the categories of bills and bonds, cash and deposits, equities, and other forms of investments. The other investment category includes both alternative asset classes (e.g., real estate, infrastructure funds, and private equity) and mutual fund investments by pension funds.

Overall, bills and bonds are the dominant asset class in the pension funds' portfolios in the case of developing countries, except for South Africa and Poland. The very low share of bills and bonds in Poland (8.3%) can be explained by the nationalisation of private pensions, due to which treasury securities have been transferred to the public PAYG system. As opposed to government securities, there is less preference for more risky and high-return assets such as equities and other investments. While in a few developing countries (Chile, Estonia, Colombia, and Peru) equity investments account for over 30% of the pension funds' portfolios, in most countries, the share of the other investment category represents less than 20% of the total pension assets. Finally, cash and deposit holdings do not represent a significant portion of the total pension assets in developing countries.

Figure 12. Asset allocation of private pension funds in developing countries, 2019 (%)



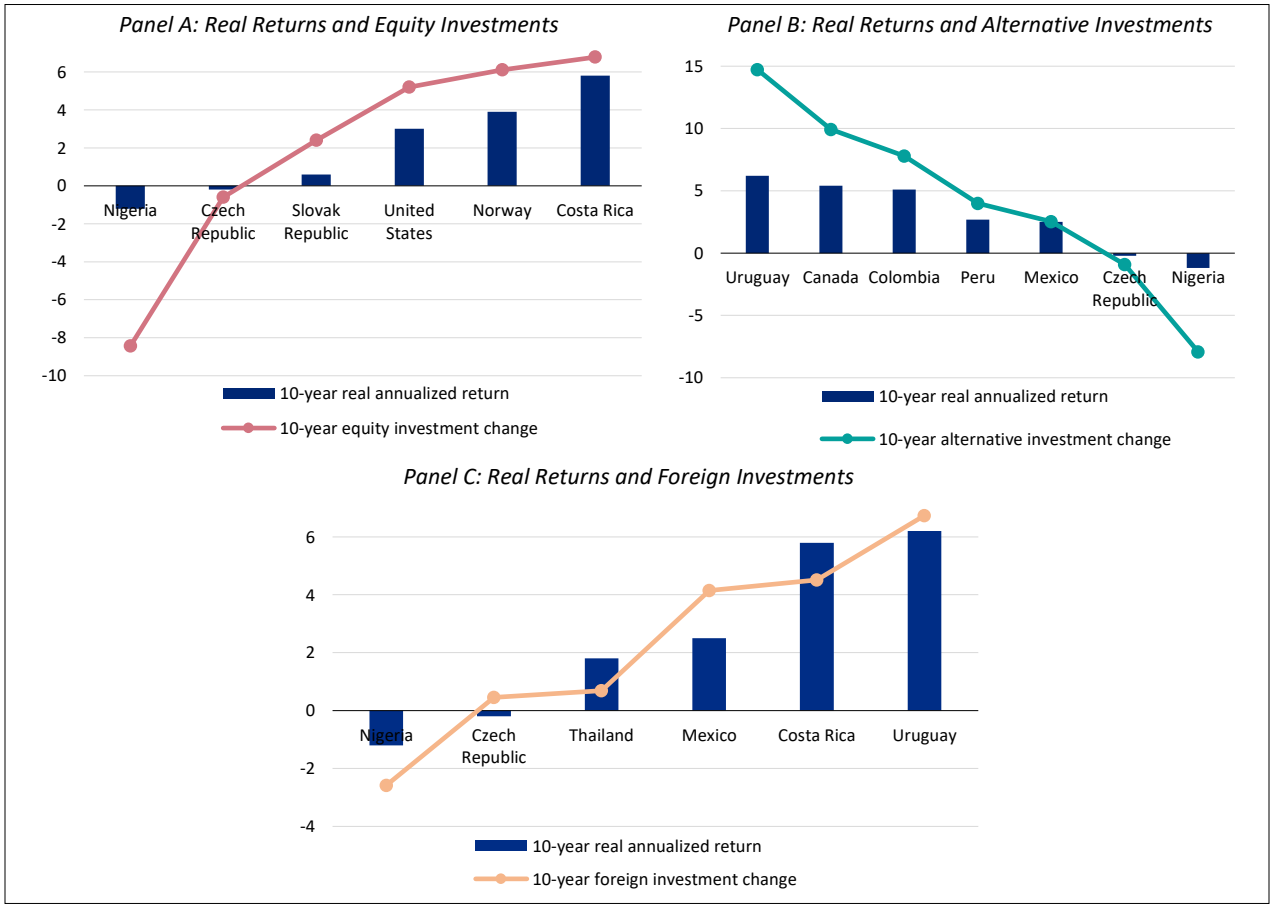
Source: OECD, 2020a. Pension Markets in Focus.

In addition to domestic investments, pension funds can diversify their portfolios across international assets. In this regard, according to the OECD (2020a) report, the highest proportion of foreign investments is observed in certain CEE countries (Estonia, Latvia, Lithuania, the Slovak Republic, and Slovenia) where it is above 60%. However, instead of diversification purposes, the main reason behind a greater preference

for foreign assets in these countries is the existence of small domestic markets to meet the demand for pension funds' investments. While in Chile, Colombia, and Peru, pension funds allocate about 35–40% of their assets to foreign investments, other countries in the sample do not have a significant share in foreign assets.

As a whole, most private pension funds in developing countries have low equity, alternative, and foreign assets exposure in their portfolios. Therefore, it may be useful to look at how changes in these asset classes contribute to the investment return of pension funds. Figure 13 shows the relationship between the changes in the risky long-term assets and the real net annualised investment returns of pension funds in selected countries during the last decade. On average, countries with a greater positive change in equity, alternative and foreign investments tend to have higher real annualised returns in their pension fund portfolios. As the country with the lowest real return, Nigeria has significantly decreased exposure to all three asset classes (equity, alternative, and foreign assets) during the last decade. Similarly, during the same period, as a country with small negative return, the Czech Republic has decreased its exposure to equities and alternative assets. By contrast, with one of the highest real return among developing countries, pension funds in Uruguay have increased their alternative assets by about 15% and foreign investments by 7%.

Figure 13. 10-year annualised real returns and changes in certain asset classes in private pensions (%)



Source: AIOS, 2019. Managed Funds Statistics; OECD, 2019b. Pension Markets in Focus; OECD, 2020a. Pension Markets in Focus.

Despite the high return potential of non-traditional assets in the long run, pension funds' strong preference for treasury securities is partially attributable to the regulatory constraints such as investment restrictions, minimum return guarantees, lack of diversification rules, and reporting requirements (Antolin, 2008; Stewart, 2014). According to the OECD, IOPS, and other regulatory reports, many pension funds in Latin American and CEE countries offer short-term guaranteed returns over inflation for their investors. Similarly, most pension funds in developing countries have investment limits on alternative and foreign assets, which offer above-average returns in the long-term due to their illiquidity premium and diversification benefits. While few pension funds have diversification rules regarding portfolio allocation, they often report their investment performance in short intervals due to the international standards. In addition to these regulatory issues, principal-agent problems that arise from the different objectives of portfolio managers and participants may cause pension funds to maximise their short-term investment performance.

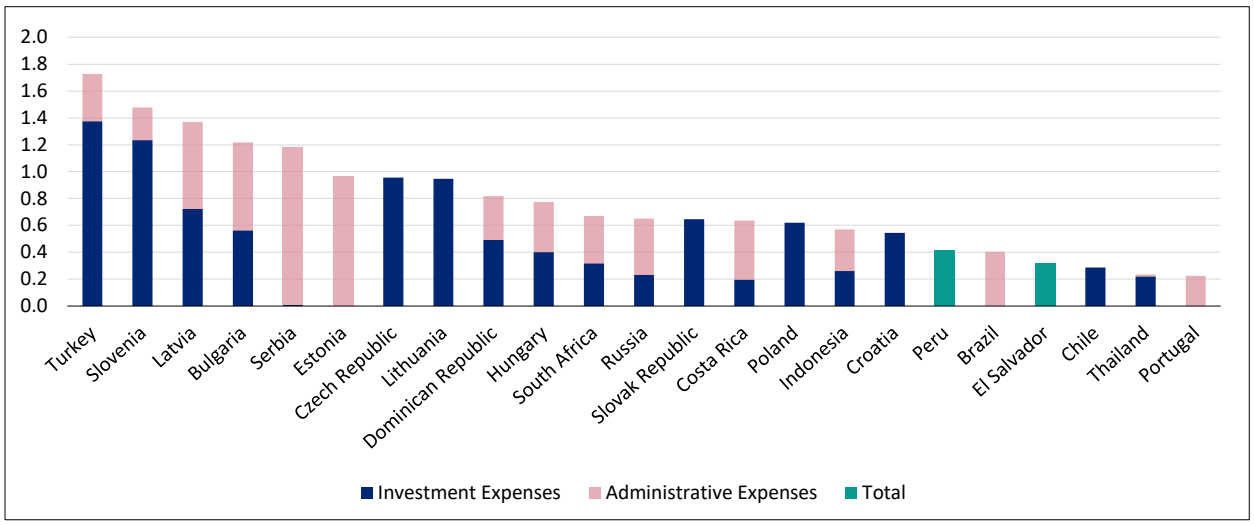
Apart from the above-mentioned issues and other barriers, one of the critical reasons for less risky asset allocation among pension funds is the lack of performance metrics for long-term investors. The existing measures and benchmarks for long-term investors are similar to those used to evaluate the performance of short-term investors. This situation leads to suboptimal asset allocation decisions by pension funds, particularly in developing countries where inflation, market, and interest rate risk are higher compared to that of developed ones. Therefore, the selection of benchmarks for risk-free and risky portfolios should be aligned with the long-term risk and return objectives of pension funds. In this respect, recent literature emphasises that long-term portfolio benchmarks should depend on life-cycle investment strategies, which are more successful at providing higher replacement income for pension plan participants than other diversified portfolios (Hinz et al., 2010; Rudolph, 2016).

Management fees

Beyond asset allocation decisions, management fees play an important role in determining the net investment performance of pension funds. The level of these fees is highly dependent on the operational costs of pension funds that are incurred in converting participants' contributions to retirement benefits. In this regard, Figure 14 shows the total operating expenses of the private pension funds in selected developing countries, which are split into administrative and investment costs.[16] As illustrated, the total operating cost exhibits large heterogeneity across selected developing countries, ranging from 1.75% in Turkey to 0.2% in Portugal. In general, pension funds in Latin American and South Asian countries have relatively low operating expenses compared to their CEE counterparts where, in general, investment costs account for the largest portion of the total costs.

[16] While administrative expenses include marketing and sales activities, recordkeeping of accounts, communication with plan participants, compliance, IT and monitoring costs, and supervisory requirements, investment costs consist of the expenses related to the management of investors' contributions such as transaction costs, investment research costs, brokerage fees, and the salaries of portfolio managers.

Figure 14. Operating costs of private pension funds as a percentage of AUM in developing countries



Source: AIOS, 2019. Monthly Statistics; OECD Global Pension Statistics.

To cover their operating expenses, pension funds charge management fees on participants' investments. To this end, Table 3 shows the total annual management fees expressed as a percentage of AUM as well as their main determinants (number of pension funds, maturity and size of the pension system, and collection type of the contributions) across developing countries where the data are available.[17]

As illustrated, the level of management fees is generally parallel with the total operating costs mentioned above. Moreover, some patterns can be observed from the table. For example, Turkey, which has the highest level of management fees, also has the largest number of pension mutual funds and the smallest pension fund size in the sample. On the other hand, Israel and Chile have the lowest management fees, and they also have the largest pension fund size in the sample with 63.9% and 80.8%, respectively. Another important cause of low fee levels in Chile may be the maturity factor – Chile privatised its pension system in 1981. Further, centralised pension systems may have lower management fees due to the low cost of contribution collection process. However, in developing countries, it does not seem to be an important factor affecting the level of fees.

[17] It should be worth noting that it is difficult to make a comparison of the management fees across countries since they can be charged at different stages of the investment process (contributions, investment returns, or assets) in fixed or variable terms. To this end, the data published by the OECD where annual management fees are expressed as a percentage of the total assets under management are useful.

Table 3. Pension fund fees and their determinants in developing countries

Country	Number of pension funds	Maturity	Size	Collection type	Fees as % of AUM
Turkey	404	2003	2.90%	Decentralised	2.00
Mexico	55	1995	18.50%	Centralised	1.00
Estonia	20	2002	18.50%	Centralised	0.96
Peru	12	1992	22.60%	Decentralised	0.88
Costa Rica	15	2000	31.60%	Centralised	0.76
El Salvador	NA	1997	40.80%	Decentralised	0.70
Slovak Republic	37	2005	12.60%	Centralised	0.63
Hungary	48	1998	5.40%	Decentralised	0.62
Uruguay	NA	1996	28.40%	Centralised	0.62
Latvia	15	2001	16.70%	Centralised	0.60
Poland	25	1999	8.00%	Centralised	0.58
Chile	30	1981	80.8%	Decentralised	0.50
Israel	29	1995	63.90%	NA	0.49

Source: Brunton, 2005. Workable Pension Systems: Reforms in the Caribbean; Tapia & Yermo, 2008. Fees in Individual Account Pension Systems; Tuesta, 2011. A review of the pension systems in Latin America; Hirose, 2011. Pension Reform in Central and Eastern Europe; OECD, 2016 & 2020a. Pension Markets in Focus; IMF, 2017. Turkey: Selected Issues; Ortiz et al., 2018. Reversing Pension Privatization; OECD, 2019c. Pensions at a Glance; AIOS, 2019. Periodic Statistics; Peksevim & Akgiray, 2019. Reforming the Pension System in Turkey; Turkish Capital Markets Association Statistics.

Note: 'NA' = Data not available.

Indeed, even small differences in fees may have a substantial impact on the net investment performance and the total value of pension savings in the long run. For example, a 1% increase in annual fees (% of AUM) implies a decrease in the annualised real return from 3% to 2% and a reduction in the final savings by about 30% under the assumptions of 5% annual real investment return, 1% annual real wage growth, and a 40-year contribution period (Bikker & De Dreu, 2009). On the other hand, a decrease by 0.25% in annual fees is expected to provide a higher pension account value by $40.000 under the assumptions of 5% annual real investment return, $45.000 annual starting wage, 1.8% annual real wage growth, 10% contribution rate, and 40 years of contribution history (Minifie, 2015).

In this context, some examples from developed countries may provide important lessons for developing ones. For example, private pensions in Australia and New Zealand have successfully reduced their management fees by merging pension fund companies, closing some accounts, and running a tender among pension funds based on several factors (e.g., fees and investment returns) (Minifie et al., 2014).

3. Auto-enrolment policy in developed and developing countries

Thus far, the paper has discussed the determinants of low pension savings in terms of coverage, contribution, and investment performance. While a high proportion of low-income people and informal employees can be considered as the main factors behind limited coverage and contribution, strong preference for government securities is an important reason for the poor investment performance of pension funds.

To encourage higher retirement savings, developing countries have already introduced some form of fiscal incentives. In many developing countries, pension plan members enjoy tax exemptions, particularly on their contributions and investment returns. Similarly, in most developing countries, matching contributions and flat-rate subsidies are offered by employers and the state. However, the effectiveness of these financial policy tools is limited to generate additional retirement savings. As discussed earlier, the only exception that can be considered is the Czech Republic, which promotes pension savings through generous financial incentives.

Apart from fiscal incentives, several developing countries have applied financial education policies, such as providing information about investment products, organising financial literacy seminars for employees, and offering financial advice for pension members. Indeed, some studies emphasised the role of financial education in promoting retirement savings, particularly among low-income populations.[18]

Compared to financial incentives and educational tools, behavioural policies, notably auto-enrolment programs, provide a more effective and economical solution for low retirement savings. More importantly, it becomes an alternative to mandatory policy tools, which may not be the best solution to increase pension savings, particularly among informal workers. Following developed countries, several developing countries have also adopted this policy to promote pension savings. Table 4 illustrates the main parameters (target population, contribution rates, opt-out period, financial incentives, default fund option, average default fund fee, and opt-out rates) of auto-enrolment programs in selected developed and developing countries.

Among developed countries, the earliest practice of auto-enrolment was put in place for certain occupational plans by the US. Following the US, other developed countries have also introduced auto-enrolment programs, either for private sector employees (Italy and Germany) or certain groups of workers (New Zealand, the UK, and Canada). In terms of contribution rates, the highest values are observed at 8% in the UK where all parties (employees, employers, and the state) are required to contribute to pension pots. While all countries have some form of tax advantage, New Zealand also offers state subsidies in auto-enrolment plans. Regarding the default fund options, all countries except New Zealand and Italy offer life-cycle funds. The highest management fee is observed in Canada since the auto-enrolment is only applied in the Quebec region. Overall, all countries in the sample except for Italy have low opt-out rates.[19]

In the case of the developing regions, Chile was the first country to introduce the auto-enrolment system, particularly for self-employed people. Similarly, Brazil introduced auto-enrolment schemes only for public servants. Indeed, the Brazilian case is different from other developing countries since the auto-enrolment plan – Funpresp – was originally an opt-in scheme, which then turned into the opt-out scheme. Taking advantage of this change, Brazil reduced opt-out rates in the Funpresp plan from 71% to 14%. Following Brazil, in 2017, Turkey introduced an auto-enrolment scheme covering all employees aged less than 45. In 2019, three CEE countries introduced auto-enrolment in their occupational plans or as new plans. The total contribution rates vary from 3% in Turkey to 10% in Chile. In particular, Turkey has a generous level of financial incentives with a flat-rate subsidy, matching contributions, and an annuity bonus. Similar to developed countries, life-cycle funds as default options are the dominant choice. While management fees are lower under auto-enrolment (e.g., Turkey), it is observed that opt-out rates are considerably high in Chile, Turkey, and Poland, compared to developed countries.

Regarding the main reasons behind opt-outs in auto-enrolment systems, qualitative research from several countries generally points to the same factor - lack of affordability. Another important reason that is cited by pension members is the limited trust in long-term investment (Inland Revenue, 2015; Prabhakar, 2017; Insurance Association of Turkey, 2018). Additionally, considering Chile's experience, auto-enrolment policies do not seem to be effective in enhancing participation rates among self-employed individuals.

[18] These studies include for example, Lusardi (2003), Lusardi and Mitchell (2007), and Wagner (2019).

[19] The suboptimal design of the default option, poor communication strategies with pension members, and the early introduction of auto-enrolment are considered to be important reasons for high opt-out rates in Italy (Rinaldi, 2011; Rudolph, 2019).

Table 4. Description of auto-enrolment programs in developed and developing countries

	Country	Implementation Year	Target Population	Contribution Rates	Opt-out Period	Financial Incentives	Default Fund Option	Default Fund Fee (% of AUM)	Opt-Out Rates
Developed Countries	US	1998	New employees in certain occupational plans	Depends on plan rules	3 months	Tax incentives	Life-cycle funds	0.75% (capped)	Low
	New Zealand	2007	New employees aged 18-64 years	Employee: 3%, Employer: 3%	Between 2-8 weeks	Tax incentives + state subsidies	Conservative Fund	0.55%	17%
	Italy	2007	Private sector employees	Employer: 6.91%	6 months	Tax incentives	Conservative Fund	0.4%	Very high
	UK	2012	Employees aged 22-65 years and who have earnings > GBP 10.000	Total contributions: minimum 8%	1 month	Tax incentives	Life-cycle funds	0.75% (capped)	10%
	Canada	2014-2017	Employees who have at least two years of tenure	Employee: 4%	2 months	Tax incentives	Life-cycle funds	1.25-1.50% (capped)	NA
	Germany	2018	Private sector employees	Depends on plan's agreement	Agreement based	Tax incentives	NA	NA	NA
Developing Countries	Chile	2012-2017	Self-employed workers	Employee: 10%	Submission of the income tax declaration	Tax incentives	Life-cycle funds	0.77%	75%
	Brazil	2015	Public servants	Employer contribution up to 8.5% of employee earnings	Anytime	Tax incentives	NA	High (7% of contributions)	14%
	Turkey	2017	Employees < 45 years of age	Employee: 3%	2 months	Tax incentives + state subsidies	Interest-bearing and interest-free funds	0.85% (capped)	~60%
	Poland	2019	Employees < 55 years of age	Employee: 2%, Employer: 1.5%	Anytime	Tax incentives + state subsidies	Life-cycle funds	0.6% (capped)	~70%
	Lithuania	2019	Employees < 40 years of age	Employee: 3%, State: 1.5%	6 months	Tax incentives	Life-cycle funds	As of 2021- 0.5% (capped)	NA
	Georgia	2019	Employees < 40 years of age	Employee: 2%, Employer: 2% State: 2%	3-5 months	Tax incentives	Life-cycle funds	NA	NA

Source: IOPS, 2012. Supervising Default Investment Funds; Minifie, 2014. Super Sting: How to stop Australians paying too much for superannuation; Veshapidze & Karalashvili, 2018. Pension Reform in Georgia; Han & Stańko, 2018. Update on IOPS Work on Fees and Charges; Krzyzak, 2018. Lithuania plans major overhaul of second-pillar pensions; Peksevim, 2018. Turkey: Rethinking auto-enrolment. OECD, 2019a. Inclusiveness and Finance; OECD, 2019c. Pensions at a Glance; Rudolph, 2019. Pension Funds with Automatic Enrollment Schemes: Lessons for Emerging Economies; Krzyzak, 2019. Georgia's auto-enrolment pension law faces constitutional challenge; Sullivan, 2019. Auto-enrolment grows globally; Peksevim & Akgiray, 2019. Reforming the Pension System in Turkey; Puls Biznesu, 2020. Borys: partycypacja w PPK wynosi 30,4 proc; OECD, 2020b. Pensions Outlook.

Note: 'NA'= Data not available; '~' = Approximately.

4. Future directions for private pensions

Given the above landscape, auto-enrolment policies have so far achieved limited success in developing countries. While the introduction of default funds is somehow effective in reducing management fees, the lack of the capacity to save and a high level of labour informality remain the major obstacles to adequate coverage and contribution levels in auto-enrolment plans. Among the other reasons for high opt-out rates, a lack of trust in long-term investment highlights the importance of the design of life cycle funds in developing countries.

In this context, the following financial as well as behavioural and technological suggestions can be considered for the future of private pensions in developing countries. While financial trends may offer significant improvements in the investment performance of pension funds, behavioural and technological developments also have the potential to expand pension coverage and contributions among the low-income and informally employed groups.

Financial Developments

- **Life-cycle funds:** The principle behind life-cycle funds, also known as target-date funds, relies on the life-cycle investing theory where individuals' total wealth is equal to the sum of their human and financial capital. While the common feature of these funds is to decrease equity allocation as investors age, different approaches are used by the investment industry for incorporating human capital into the calculation of total wealth. For example, the '100-age approach', which is a simple rule of thumb for life-cycle funds, suggests that the percentage of equities in a retirement portfolio should be equal to the difference between 100 and the investor's age. On the other hand, life-cycle funds offered by some of the biggest pension plans in Chile and Denmark prefer a stepwise approach where the portfolio weight of equities goes down as investors reach certain age thresholds.

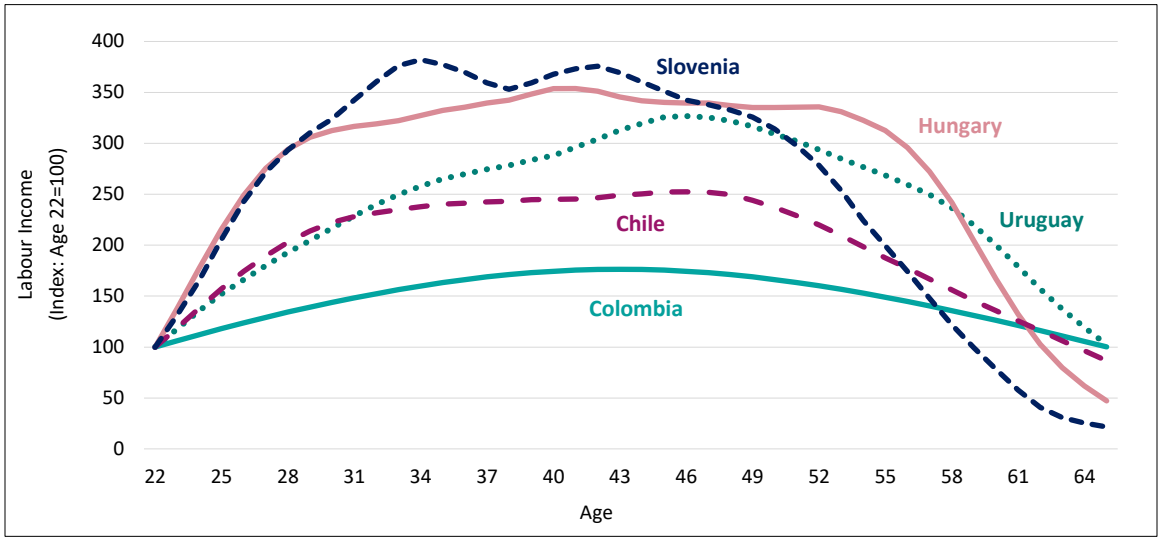
  Apart from the aforementioned approaches and more[20], the studies by Cocco et al. (2005) and Viceira (2010) indicate that human capital should be modelled according to each country's labour income distribution over the life cycle. In this respect, first, it may be useful to illustrate how employees' earnings may vary substantially among developing countries. Figure 15 shows standardised labour income by age in Slovenia, Hungary, Uruguay, Chile, and Colombia. Overall, the labour income profiles in all countries exhibit a hump-shaped curve.[21] However, despite similarities in the overall shape, there are important differences in labour income across countries. For example, employees' earnings peak at different ages over the life cycle. While in Slovenia, labour income takes the highest value at about the age of 35, it flattens out in Hungary in the 40s and in Chile, Colombia, and Uruguay at or after the age of 45. Moreover, the shape of labour income shows different patterns at younger and older ages. While in Slovenia, Hungary, and Uruguay, labour earnings increase rapidly at younger ages and decrease significantly at older ages,

[20] For different approaches to life-cycle fund design, please see studies (Antolin et al., 2010; IOPS, 2012; Peksevim & Akgiray, 2019).

[21] This pattern is also parallel with the age-earnings profiles in most developed countries (Benzoni & Chyruk, 2015; Aktuğ et al., 2020).

a moderate rise and fall are seen in the case of Chile and Colombia. Such differences imply disparities in the importance of human capital at different ages.

Figure 15. Labour income profiles in selected developing countries



Source: National Transfer Accounts Database.

Note: Data for labour income relate to different years for different countries (1997 for Chile, 2004 for Slovenia, 2005 for Hungary, 2006 for Uruguay, and 2008 for Colombia) due to the availability of data.

In addition to the differences in the age-earnings profiles, the existence of temporary and permanent shocks in labour income is of great importance in modeling human capital for each country. While temporary shocks (e.g., maternity leave and short unemployment) have transitory effects on workers' future earnings, permanent shocks (e.g., disability and promotion) may lead to a change in the subjective expectation of labour income. Depending on the degree of these random shocks and their correlation with risky assets (e.g., equities), life-cycle funds may have a completely different portfolio structure from the conventional target-date funds (Viceira, 2010; Blake et al., 2014). Therefore, it is critical to consider the structure of labour income and its riskiness while designing life-cycle funds as default options in developing countries.

- **ESG investments:** In recent years, many pension funds in Europe are increasingly considering environmental, social, and corporate governance (ESG)-focused investments as a part of their long-term asset allocation. By allocating some portion of their assets to ESG investments, pension funds may align with their members' sensitivities to responsible investment, fulfil their sustainability requirements, and take advantage of the diversification benefits.

  The pension funds in the US, UK, Australia, Netherlands, Canada, and Japan allocate a significant portion of their investments to ESG assets, such as green bonds, social infrastructure, and clean energy investments. Moreover, in recent years, some of the biggest pension funds in the UK have started to include ESG-based investments in their default fund strategies. For example, in 2016, HSBC Bank UK Pension Scheme adopted Legal & General Investment Management (LGIM) Future World Fund as a default equity option, which invests in companies with low carbon activities and

high environmental rankings. Likewise, in 2017, the government-based auto-enrolment plan NEST decided to allocate about 10% of its default fund portfolio to 'UBS Life Climate Aware World Equity Fund'. Following this trend, Smart Pension Plan announced that they will gradually shift about 70% of assets in their default fund towards ESG focused investments (Flood, 2016; Fernyhough, 2017; Dohle, 2020).

However, few of the developing countries have adopted ESG investments in their pension fund portfolios. Foremost among them is South Africa and Brazil where legislation on pension funds is implemented to consider ESG factors in their long-term investment strategies. As of 2017, The Government Employees Provident Fund (GEPF), the biggest pension fund in South Africa, reported a 5% allocation to social investments, including the areas of renewable energy, agriculture, and economic and social infrastructure. On the other hand, the Brazilian pension fund Valia invests about 4% of its total portfolio in green equities (OECD, 2019d).

Despite having low importance, ESG investments can provide diversification benefits to pension funds in developing countries, which have strong preference for fixed income instruments in their portfolios. Additionally, with the growing interest in auto-enrolment policies of developing countries, ESG investments may be offered as default options in pension plans. However, while incorporating ESG assets into their portfolios, pension fund managers should not forget their main objective – ensuring the adequate standard of living for their participants during retirement.

- **Decumulation phase investment products:** So far, the second part of the paper has focused on the issues that are related to the accumulation phase of pension funds, i.e., in other words, the stage where the contributions of participants are invested in a mix of asset classes to build savings for retirement. Certainly, the decumulation phase is also of great importance for successful retirement planning. In response to the increasing life expectancy, different forms of annuities (e.g., inflation-indexed annuities, variable annuities, and advanced life-deferred annuities) have been introduced to protect retirees from running out of their savings. However, due to some supply- (e.g., lack of annuity products, high annuity prices, and adverse selection problems) and demand-side constraints (e.g., the complexity of annuity products, lack of financial literacy, and behavioural biases), annuity markets are undeveloped in most countries (Rocha et al., 2011).[22]

  In recent years, academic and industry researchers designed certain other investment alternatives to annuities, which address the conditions and risks both in the accumulation and decumulation phases of retirement planning. For example, Robert C. Merton and Arun Muralidhar, have developed a new pension bond called 'SelFIES', which offers periodic coupon payments to their participants as pension payouts. As stated in their study, *'The SeLFIES bond is a single, liquid, low-cost, low-risk instrument [that is] easy-to-understand for even the most financially unsophisticated individual, because it embeds accumulation, decumulation, compounding and inflation adjustments'* (Muralidhar & Merton, 2020). SeLFIES bond is also recommended for pension

[22] In this respect, governments can support the development of annuity markets by issuing longevity-bonds and other mortality-linked securities (Blake et al., 2010). These bonds are typically based on coupon payments that are linked to the life span of the individuals in the same cohort and do not include principal payments.

systems in some developing countries such as Brazil, India, and Turkey. Similarly, a Danish start-up company, Linnemann Actuarial Consulting, has developed a new algorithm-based target-date fund design, called iTDFs, which provides portable, scalable, and low-cost investment solutions for pension plan participants. iTDFs combines the accumulation and decumulation phases of retirement planning with life-cycle funds and smoothed income annuities and offers customised features to their participants in comparison with traditional 'one-size fits all' target date funds (The Actuary, 2020).

Behavioural and Technological Developments

- **Digital nudging tools:** By incorporating the insights of behavioural economics into technology, digital nudges can be used to encourage retirement savings behaviour. Besides being available in various forms, the most recently introduced digital nudges include round-up apps, gamification tools, and saving through consumption platforms.[23]

  One of the digital nudging tools used to promote savings behaviour is round-up apps. The main feature of these applications is to round-up your daily purchases and invest the spare amount into your savings accounts. For example, if you buy 3.90$ coffee from Starbucks and pay 4.00$, 0.10$ is automatically transferred into your pension pot. Another way to nudge people in a digital environment is gamification tools, which integrate gaming elements, such as increased challenges, reward systems, and penalties, into real-world practices. Exploiting people's tendencies related to curiosity, accomplishment, and unpredictability, gamification-based applications may encourage people to save.

  Beyond the digital nudges mentioned above, saving through consumption platforms aim to increase pension savings, particularly among the population of low-income individuals, self employed people, and women. While differing in detail, these platforms typically work in the following way: when people purchase an item such as food, cloth, or a cinema ticket from selected retailers or stores, a certain amount of their payments is automatically transferred to their pension accounts. In other words, these tools automatically transform spending behaviour into saving habit. Among the applications in this category, a low-cost platform called 'Miles for Retirement' has been implemented in Mexico to encourage pension savings among low-income people and self-employed individuals (Hernandez et al., 2017). Similarly, a Spanish start-up developed a mobile application called 'Pensumo', which also allows its members to increase their savings by engaging in socially responsible activities (e.g., recycling and road safety initiatives) in addition to saving through consumption activities (Benavides, 2019). Another example is the 'SuperSuper' platform, which aims to reduce the gender gap in retirement income and increase pension savings among Australian women (Collett, 2018). Considering the fact that the share of consumption relative to GDP is about 60% in developing countries, savings through consumption tools may offer

[23] There are also 'digital saving' applications that use social networking platforms (e.g., Daily Dollar) in order to nudge people to save (Blake, 2020).

significant potential to expand pension coverage and contribution among the vulnerable groups in these regions.

- **FinTech applications:** The rise of big data analytics, artificial intelligence, cloud-based applications, and other FinTech tools can facilitate pension communication between pension members and providers, offer robo-advisory services, and provide digital solutions to micro-pension arrangements.[24]

  FinTech applications can facilitate the interaction between plan members and providers through pension platforms and dashboards. By using these tools, pension providers can send automatic reminders to their plan participants in terms of increasing contribution rates or changing asset allocation in pension plans. Moreover, investors can view one-shot pictures of their retirement pots via pension dashboards; they can track their pension entitlements, simulate projections for their retirement goals, and compare the investment performance of multiple pension schemes on one platform (OECD, 2017a).

  As one of the artificial intelligence applications, robo-advisors can offer low-cost portfolio management and financial advisory services to investors, driven by their highly automated process and the strong reliance on passive investing. Due to their user-friendly interfaces, robo-advisors can make retirement planning simpler and more transparent to pension members, particularly regarding the disclosure of management fees and advisory costs. While the US has the leading robo-advisory industry in the world with total assets under management amounting to approximately $700 billion, the role of robo-advisory services remains limited in European and other developing countries (Wealth Advisor, 2020).

  Another important advantage of FinTech tools is that they can give rise to the development of digital micro-pensions. As one of the long-term products of the microfinance industry, micro-pensions allow their members to make small contributions at irregular intervals. On that basis, these arrangements are particularly suitable for developing regions, where the share of low-income and informal sector workers are relatively high. While various applications of micro-pensions are available in some African (e.g., Kenya, South Africa, and Uganda) and Asian countries (e.g., Bangladesh and India), they remain limited and need further technological developments. In this respect, FinTech tools can provide digital application, payment, and distribution services to micro-pension participants at low-cost. One of the important providers of digital micro-pensions is a global social enterprise called ‘pinBox Solutions’. As of 2021, they aim to expand micro-pension inclusion for 100 million individuals across Asia, Africa, and Latin America (Pinbox Solutions, 2020).

- **Blockchain technology:** Although, FinTech tools can provide efficiency in terms of pension communication and investment management services, the distributed ledger technology, also known as blockchain, may offer more powerful solutions for certain elements of the pension system design. The blockchain technology has the potential to create a more sustainable pension

[24] In addition to these advantages, FinTech tools can provide efficient risk management for pension providers, support compliance process via Management Information Systems (MIS) and create digital platforms for small employers to make auto-enrolment schemes more accessible and affordable.

ecosystem by reducing the operating costs of funded pensions and enhancing transparency, trust, and security of pension schemes.

With respect to the reduction of administrative costs, blockchain technology could largely eliminate labour-intensive daily tasks (e.g., recordkeeping of plan participants, calculation of pension benefits, and preparation and copying of documents) and compliance costs of pension funds via automated transactions. In terms of investment management expenses, trades based on smart contracts may reduce transaction costs through aggregate transactions and the elimination of the intermediaries (OECD, 2017a). To this end, blockchain technology may be particularly beneficial for developing countries such as Turkey where the management fees of pension funds are relatively high.

Another important advantage of blockchain technology is that distributed systems can improve the transparency, trust, and security of pension schemes. The recorded data in smart contracts cannot be deleted or edited and can be easily shared transparently with all parties in the blockchain network, such as plan members, pension companies, and regulatory bodies. Moreover, in contrast to the centralised database, data on pension plan participants are stored and kept by other nodes of the blockchain. With this advantage, blockchain technology can ensure trust and security in the system, without either party on the blockchain network being exposed to risk.

However, despite its increasing usage in banking and financial services, blockchain technology has limited applications in the area of pension funds administration and management. As already known, APG and PGGM, two of the biggest pension funds in the Netherlands, have a pilot project on building blockchain infrastructure for pensions (Allessie et al., 2019). Moreover, recently, the Bangladeshi government has announced its plans to use IBM's Blockchain platform to improve the efficiency of its primary school teachers' e-pension system (Pension Policy International, 2020). It is important to note that blockchain platforms become more expensive as systems become more complex due to the higher costs of authentication and processing of large amounts of data. Therefore, this technology may be particularly advantageous for developing countries where small-scale pension systems are dominant.

While all these general recommendations are useful in improving the design of pension systems in the developing world, it is not possible to say which policies might work best due to the widely different contexts of different countries. As Prof. Olivia Mitchell noted: *'There is no "best" pension system: every country needs to find its own way to structure retirement security, while taking into account economic reality and cultural values.'* (Financial Services Advisor, 2020).

Finally, certain risks are non-diversifiable and, hence, not insurable in retirement planning, such as the ongoing pandemic that is reshaping our world.

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