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REPORT

Pension systems in Europe: challenges and best practices

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Pension systems in Europe: challenges and best practices

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Executive Summary

PAYG financing is a driver for public debt

The results of the country studies and the key indicators in the Overall Pension Index (OPI) show that PAYG pension systems tend to be more affected by financial pressures resulting from the demographic transition. In simple terms, systems with a strong focus on PAYG financing are often confronted by an “institutional trade-off”: Cost-dampening policies strengthen the financial sustainability of the system at the expense of future generosity and adequacy. Conversely, generous PAYG pension systems come at the cost of reduced financial sustainability. Austria exhibits a strong reliance on PAYG financing. The impact on public spending is obvious, despite the cost-containment measures already legislated, which will lead to future cuts in the generosity of the pension system. Public pension spending is expected to increase to more than 15% of GDP by the mid of the next decade – at the same time the benefit ratio will drop significantly, potentially leaving larger groups of retirees at risk of poverty. Demographically induced increases in expenditure can also be observed for other PAYG systems: Public spending will be at almost 18% of GDP for Italy in 2035 or at 12% for Germany. At the same time, and in countries with well-developed funded pension components, spending for public pensions in 2035 will be 9% in the Netherlands, 7% in Sweden or 8% in Denmark. Public pension spending is also a relevant source for public debt sustainability risks. The EU Commission's S1 indicator, which measures medium-term fiscal sustainability risks, assigns a medium risk to Germany and Austria and a high risk to Italy. Conversely, many of the countries in our sample with extended funded pension components, in particular Sweden and Denmark, are considered to have low sustainability risks.

Austria is lagging behind in the development of funded pension provision

Despite future reductions in benefit levels and generosity, which have already been legislated in Austria, the build-up of funded pension capital has not yet accelerated. Total assets in funded and private pension plans increased moderately from a low level and amounted to around 7% of GDP in 2021. This is well below the comparative figures especially for the countries with a stronger focus on funded pensions – for example the Netherlands with around 215% of GDP, Sweden with 120% or Denmark with 235%. However, Austria stays also below countries that themselves have a strong focus on PAYG financing, such as Italy with 13% or France with 12%. The annual volume of contributions reflects the still weak expansion of funded pension plans in Austria. In 2021 contributions to funded and private pension plans amounted to 0.3% of GDP in Austria, compared to 9% in Denmark, 4.5% in the Netherlands or 8% in Switzerland. The coverage of participants in voluntary occupational pensions relative to the working age population was at 15% for Austria in 2021, compared to 54% in Germany or 23% in France. For Denmark, the Netherlands or Sweden the coverage in occupational plans varies between 90% and 100%. Correspondingly, the coverage of voluntary individual plans in Austria (“prämienbegünstigte Zukunftsvorsorge”) was 16.5% in 2021, compared to about 30% (“Riester”-contracts) in Germany. Accordingly, the development of forms of funded pension provision continues to show great potential for Austria.

PAYG driven debt and lacking fiscal sustainability is an obstacle to competitiveness

Competitiveness is a relevant precondition for the financing of all pension systems. Competitiveness determines important framework conditions for pension financing, such as wage and growth developments, inflation and the development of interest rates, company returns and macroeconomic conditions in general. The relevance of competitiveness initially applies regardless of the financing system. Also, systems with a stronger focus on funded financing are not exempt from the systemic imperative of competitiveness. For example, the country analysis of the Netherlands shows that the high prevalence of funded DB systems in combination with very low interest rates has led to financing bottlenecks. The result was a gradual increase in contributions while at the same time suspending the indexation of the benefits paid. Recent political reforms are ushering in a transition from DB to DC systems. In addition to the demographic pressure, the financing of benefits in PAYG systems, however, is primarily dependent on the development of macroeconomic conditions. Productivity and its development are crucial for wage development and thus for the development of the contribution bases of public PAYG pension systems. There is high potential for a vicious circle if the increasing fiscal burden on public pensions reduces competitiveness and thus itself becomes an obstacle to productivity development. This can be clearly seen in Austria where, for instance, in 2022, 55 billion EUR from the budget were spent on old-age benefits (including pensions). At the same time only 1.7 billion EUR were spent on environment protection and energy, and 6.2 billion on primary and elementary education. While the latter categories of expenditure could be clearly considered “future-oriented” expenditure which would help support long-term competitiveness of the Austrian economy, there is a clear bias towards financing the past commitments.

The productivity development in particular is an essential base for financing pension systems, which are already under demographic pressure. Here too, the key indicators in the Overall Pension Index (OPI) show that hybrid systems, in which pension provision is based on an integrated multi-tier mix of funded and PAYG systems, are more capable of meeting this challenge.

Leading countries offset a negative relationship between sustainability and adequacy, also due to funded pension schemes

Analyses within the Overall Pension Index (OPI) reflect the aforementioned “institutional trade-off” between cost dampening and the maintenance of generosity. This indicates a negative correlation between future generosity in the sense of adequacy and sustainability. However, this negative relationship between sustainability and adequacy is offset in countries with a stronger focus on funded pension spending. For the leading pension systems in the Netherlands, Denmark or Sweden no such negative correlation is recognisable. These three countries achieve favourable results in terms of both criteria, sustainability and adequacy as well. For the remaining eight countries, the analysis of the OPI key indicators shows the trade-off. The results from the statistical analysis suggest that this is also due to the relevance of funded pension provision. The variation of countries in funded pension assets explains almost 50% of the variation in the overall OPI scores.

The medium-term performance of pension funds is also decisive for the ability of funded pensions to fulfil key functions of pension provision and income security in old age. Over the period from 2011 to 2021, the average real investment rate of return in Austria was 2.8%. In the countries that perform best according to the analysis of the OPI scoreboard, it is not only the importance of funded pensions for the provision of pension income that is higher. The leading countries also showed a significantly better investment performance. Over the period from 2011 to 2021, the average real investment rate of return of funded pension plans in Sweden and Denmark was around 5%, in the Netherlands even around 5.7%. Efficient regulatory framework conditions are particularly relevant for medium-term performance.

Assets in funded pensions are a driver for innovation and productivity

The expansion of funded pension components is also a driver for innovation and productivity. Countries with more developed funded pension schemes achieve better results in terms of the innovative capacity of their society and economy. The statistical relationship is evident, when assets in funded pensions are compared to innovation indicators such as the European Innovation Scoreboard, the volume of venture capital investments or the results from the Global Innovation Scoreboard. Not only do the funded pensions system guarantee improving the financial sustainability of the public budgets and improve on the incomes of retirees, but they also provide the – much needed – boost of capital for investment and innovation.

Overall, the expansion of funded pensions promotes macroeconomic development

The macroeconomic simulation analysis shows positive macroeconomic effects resulting from the extension of funded pensions. The supply of financial assets boosts national investment and as consequence labour demand, labour income and GDP. In addition, higher pension fund assets expand supply of financial funds for private equity investments leading to a higher productivity in the economy. GDP and real investment in the considered economies rise in line with the stock of pension funds and are significantly higher than without pension fund investments. For the EU-27 GDP per capita rises by 1.130 Euro in 2070. Moreover, the higher economic activity improves public finances in these countries by about 0.4 to 0.5 percent of GDP, if implemented on the EU-level by 0.6.

Pension systems are the result of specific historical pathways

The design of pension systems is a result of gradual and often path-dependent “parametric” policy reforms. This is also due to institutional, political and economic restrictions: Once a system is established, substantial “non-parametric” reforms produce winners and losers. It is important to bear in mind that once a system is established, institutional lock-in effects often contribute to a fundamental persistence and maintenance of its institutional features. As mentioned, the pension systems in Sweden, Denmark or the Netherlands achieve overall good results in the analysis of key indicators within the scope of the OPI index. This is partly due to the development of funded pension components. The high level of the funded components in these countries must be understood from the historical context of parametric reforms and path dependencies.

Similarly to Austria or Germany, the **Netherlands** implemented a public PAYG pension system in the 1950s. Back then, PAYG financing was considered as a “natural” form of pension financing.

However, in contrast to the Bismarckian counterparts in Germany or Austria, the Dutch PAYG (AOW) scheme was originally designed as a universal flat-rate system, providing basic pension benefits that were targeted at the minimum wage. Ensuring the maintenance of living standards was not a function of the system. In a post war “golden area” of the social market economy trade unions put pressure on employers to ensure for additional funded pensions. Following the corporatist tradition of the Dutch welfare state, these systems were implemented by collective agreement at industry level. When cost dampening policies led to cuts in the public PAYG (AOW) system from the 1980s onwards, these losses were compensated for by funded pension provision. Already in the 1990s, the first PAYG tier provided only 45% of pension income in the Netherlands, while the provision of old-age income was still relying to a much greater extent on PAYG in Austria or Germany. Occupational pensions have high legitimacy and acceptance in the Netherlands and they also have an important and integrated function in the overall pension system. Social partners and employee representatives are highly involved in the management and organisation of pension funds at a sectoral level.

Similarly to the Netherlands, a comprehensive national pension system that guaranteed income security to every citizen had been established in **Sweden** by the mid-1950s. Industrialization after the Second World War required changes to the system, to account for the growing sectors of labourers. In 1959, the parliament accepted a generous public pension model that included a universal national pension supplemented by earnings-related PAYG pensions. Already in the late 1970s it became clear that the system was not sustainable in the long run. Systemic reform efforts failed in the 1980s. An abolition of the pension system by social democratic governments would have been seen as a “political defeat” for the trade unions. After the 1991 elections a new centre-right government was formed. This opened a window of opportunity for “blame-avoidance”. By involving the trade unions in the reform process, the government gave them the opportunity to present themselves as protagonists and to represent and articulate their demands and values within the reform process. Their main demand was to portray the reform as a reformation and not as an abolition. For instance, familiar concepts and terms of the old system were used in order to strengthen the legitimacy and public acceptance of the reform. It is important to notice, that in the first half of 1990s Sweden entered a deep financial and economic crisis, which necessitated the rethinking of the components of the pension system. In the wake of a severe financial crisis, problems with financial stability, equivalency and long-term stability became obvious. The main shortcomings of the old system provided the reasons for the 1998 pension reform: The first was the dependence between financial performance and economic growth. The second was the design of the earnings ceiling for the calculation of pensions. The third key rationale behind the Swedish pension reform of 1998 were the expected costs of demographic ageing. The Swedish pension reform converted the old universal national pension into a new guaranteed pension. Under the given historical conditions, it was possible to implement substantial non-parametric reforms in the 1990s, while comparable welfare states were still engaged in more “incremental” policy reforms. Key success factors were, on the one hand, the “pressure to act” due to the financial and economic crisis, but also the broad involvement of stakeholders and employee representatives.

In **Denmark** the first initiatives for earnings-related supplementary schemes were taken in the early 1960s. In contrast to the other Nordic countries and more comparable to the Dutch PAYG (1st tier) system, the Danish scheme was designed as a flat-rate system. It was the unions that opposed earnings-related systems because they would perpetuate inequalities in the labour market by providing pension benefits equivalent to earnings. The upper middle- and higher-income groups attempted to cover their preference for maintenance of living standards through supplementary occupational benefits, leading to an increasing coverage of occupational pensions. In the 1980s the discussion of the Danish pension system was triggered by the inequality between the basic pension receivers and those covered by the funded occupational schemes. One reason for this inequality was the economic situation in the early 1980s with high interest rates. While contributions to the different kinds of supplementary pension schemes were tax-deductible, interest on these savings was not taxed. The second reason which led to the Danish pensions reform was a more competitiveness-oriented policy: given a negative balance of payments, the government wanted to improve the competitiveness of the Danish economy by policies of wage moderation. The pressure from several trade unions, particularly the Union of Danish Metalworkers, led to decentralization of wage negotiations in the late 1980s. This change made it possible for unions to get agreements on pensions covering only their members and creating selective incentives for joining trade unions. The new pension schemes were managed by corporatist boards with equal representation from employees and employers. These agreements started the substantial increase in the coverage of funded occupational pensions. Funded occupational pensions achieved a high level of acceptance and legitimacy as early as the 1990s. They play an important role in Denmark's overall pension system as regards the provision of adequate replacement rates to pensioners. More than 90% of employees pay into supplementary sector-specific occupational schemes. Since their introduction in the 1990s, the coverage of these schemes has increased drastically, making them almost universal.

Lessons must be learned from the historical pathways in the leading countries

In Sweden, Denmark and the Netherlands, which are the leading countries according to the OPI analysis, funded occupational pensions have a high level of acceptance and legitimacy. The participation in these countries varies between 90% and 100% in relation to the working-age population. Embedded in a multi-tier overall pension system with funded and PAYG elements, funded occupational pensions ensure relevant functions in the overall pension system. In the Netherlands, for example, pension funds implicitly take into account a PAYG component, the so-called AOW franchise, when calculating contributions to an overall contribution rate. One of the first lessons learned from historical developments in the leading countries suggests that the high level of acceptance and legitimacy in these countries does not arise independently of the institutional design of the overall system and the design of the public PAYG components. For example, the function of maintaining the standard of living is largely fulfilled by funded occupational pensions, while the public PAYG systems provide only basic flat-rate benefits. In contrast to this, in the Bismarckian systems the function of maintenance of living standards is directly fulfilled by the public PAYG systems.

The "extended" functionality of the Bismarckian PAYG systems can trigger a political lock-in effect with adverse consequences for long-term sustainability. It has the potential to impose "political costs" for current governments if certain functionalities such as equivalence-based protection of living standards are decoupled or "abolished" from the public PAYG system and shifted to funded occupational pensions and funded capital that – to a large extent – has to be built up. For instance, the coverage of occupational pensions and assets in funded pensions are still comparatively low in Austria. Therefore, in addition to contributions and tax-payments into the existing PAYG system, pension capital must be accumulated to finance funded pension entitlements.

The political aspect could be even more important if the capital build up in the funded components creates the impression of an additional burden beyond the contributions to the PAYG system. Here too, the lessons from historical pathways of the leading countries are exemplary: The broadening inclusion and expansion of funded pensions partly took place parallel to cost-dampening policies in the public PAYG systems. As a result, as in the Netherlands, for example, a systemic transition was pursued, giving the impression of a substitution of system components rather than the abolition of existing systems or an additional contribution burden.

A high level of acceptance and legitimacy for substantial and non-parametric reforms is more likely to be achieved if the impression of intergenerational justice can be conveyed. Fairness must be conveyed across different age groups and the impression that certain cohorts are financially disadvantaged should be avoided as far as possible. PAYG systems implicitly include a "first generation's gift." The first generation of pensioners received benefits without having paid contributions. The funding for the first generation's gift was shifted to future generations. In fact, it is the generation that, in addition to financing existing entitlements in the PAYG system, also has to build up the capital stock for its own funded pension that finances most of the "gift" to this first generation.

The implementation of reforms can be more easily argued if the public understands the pressure to act. This was the case in Sweden, for example, in the context of the financial crisis of the 1990s. Here, the perception of long-term sustainability deficiencies was accompanied by acute financing shortages. In the context of maintaining competitiveness, a general understanding and pressure to act was also present in Denmark during the late 1980s and early 1990s, or also in the Netherlands. In the Netherlands, a competitiveness-oriented policy resulted in the 1982 Wassenaar accord of the social partners. Already in the 1970s the development and indexation of the minimum wage, that serves as a target for public AOW (PAYG) pensions, was decoupled from the development of real wages.

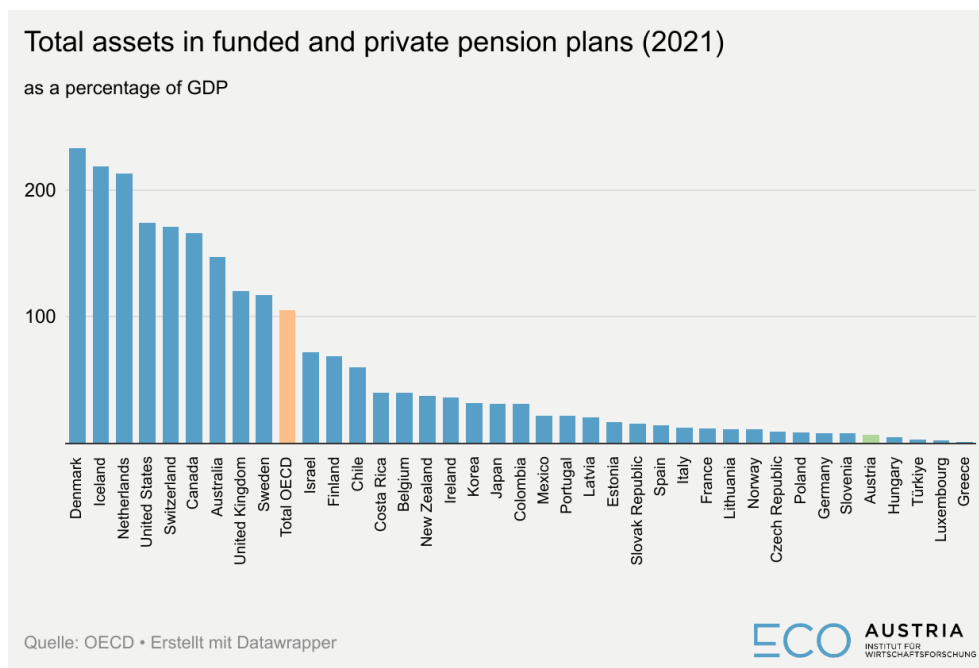
The broad involvement of social partners and interest groups can hamper substantial reform processes. At the same time, the involvement of interest groups and the coordination of interests can support the acceptance and legitimization of reforms, especially in sensitive areas such as pensions, once an agreement has been reached. In the Netherlands and Denmark, occupational funded pensions were set up precisely because of pressure from the trade unions. In the Netherlands, social partners are directly involved in the management of the large industry-wide funds. In Denmark, the funds established in the 1990s are managed by corporatist boards with equal representation from employees and employers.

1. Introduction

When considering pension systems, a fundamental distinction must be made between funded systems and those based on the pay-as-you-go (PAYG) method, as well as between defined-contribution and defined-benefit systems. Pension provision can be carried out within the framework of a public system, or it can be carried out through a private insurance of the population, either in a compulsory or voluntary way.

Demographic trends and the need to consolidate public budgets make it necessary to curb the spending dynamics of public pension expenditure. According to the projections by the European Commission (EU, 2021) the old-age dependency ratio that is the number of persons aged 65 years and more to the number of persons aged 20 to 64, is projected to rise from 34 in 2019 to 59 in 2070 for the European Union as a whole. This results in a strong increase in the ageing related spending from 24% of the European GDP in 2019 to between 26 and 29% in 2070, depending on the analysed scenario. The largest element of this increase concerns pensions and varies between -3.8 and 8.7 percentage points of GDP depending on the country. Many European economies will experience an increase of about 1 to 3 percentage points of GDP, despite already implemented pension reforms leading to lower benefit ratios.

Figure 1: Total assets in funded and private pension plans

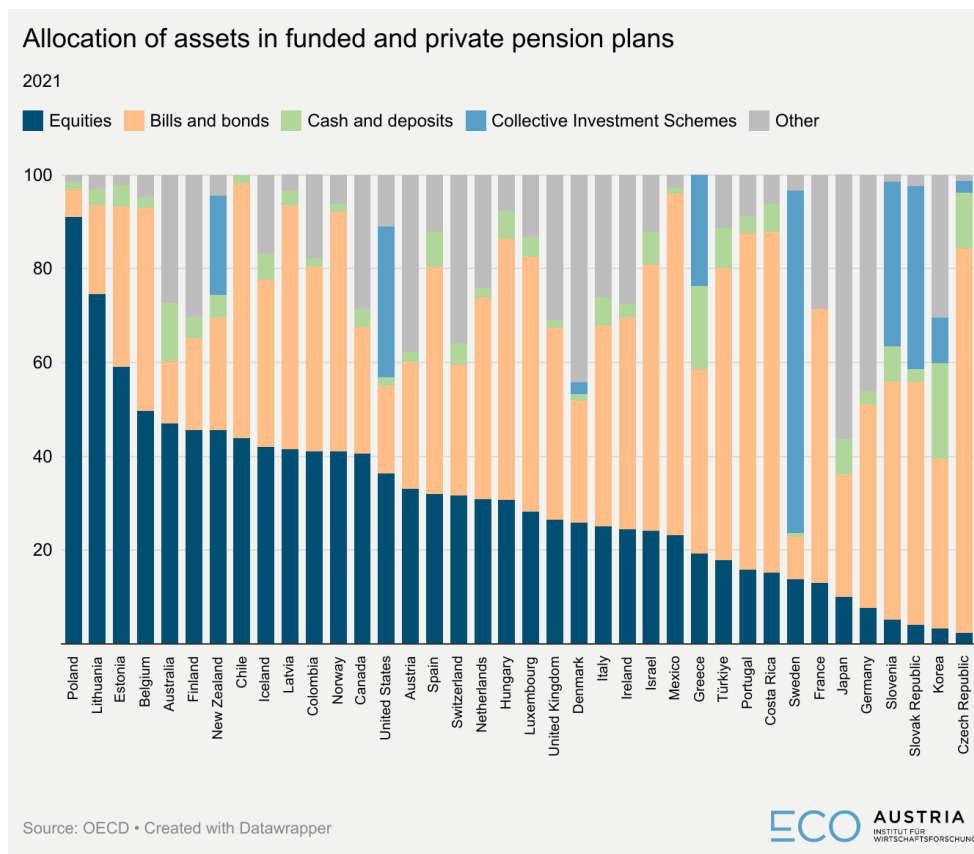


Funded forms of old-age provision currently complement the state pillar of old-age provision in some European countries. These consist of occupational pension provision as the second tier of old-age provision and individual pension provision as the third tier. Nevertheless, as can be seen in Figure 1, there is substantial heterogeneity between the countries regarding the amount of savings in the funded pensions schemes. Given that the pressure on public finance in the PAYG system is increasing due to ageing, the development of a larger funded component might

contribute to curbing the dynamics of public pensions and compensate for decreasing benefit ratios in order to guarantee the adequacy and generosity of pension systems.

On the other hand, funded pension systems also contribute to the development of the economy, as the collected funds are invested in different classes of financial products, allowing the companies to raise funds for investments or innovation. Figure 2 shows the distribution of assets according to classes in the OECD countries. The effects on the economy depend on how the assets are allocated, which in turn depends on the regulatory elements in each country. For instance, some countries allow more risky allocations than others. Eventually, however, a large part of assets is allocated to equities, which in any case contribute to positive economic outcomes.

Figure 2: Allocation of assets in funded and private pension plans



Investment from assets of funded pensions assets can serve as a financing source for innovation and business dynamics. This might explain why countries with more assets in funded pension schemes perform better in innovation rankings such as the European Innovation Scoreboard (Section 2.14.6).

The following report is structured into the following parts. Section 2.1 gives an **overview on the general structure and architecture of pension systems**. The essential terms of research on pension systems are defined and the basic elements of the established three-tier model are shown. The structure in the country-specific chapters largely follows the structure of a 3-tier model, provided by the OECD. Other classification systems from the World Bank or from national

country-specific sources that differ from the OECD structure are also referenced. The advantage of the 3-tier OECD model is that this structure is applicable to most countries.

Sections 2.3 to 2.13 provide a detailed insight into the pension systems of 11 countries in the comparison group: Austria (2.3), Czech Republic (2.4), Germany (2.5), Denmark (2.6), Italy (2.7), Latvia (2.8), Netherlands (2.9), Poland (2.10), Sweden (2.11), Slovak Republic (2.12) and the United Kingdom (2.13). Basic institutional elements of public pension systems are presented, fiscal sustainability risks resulting from the ageing of society are highlighted, and the state of development of funded pension plans is outlined.

The design of pension systems is also a result of gradual parametric policy reforms. A particular institutional structure often exhibits a high degree of institutional path dependency. In preparation for the country studies in chapters 2.3 to 2.13, the history of policy reforms is described for Sweden, Denmark and the Netherlands (Section 2.2). These are the “leading” countries according to the later scoreboard analysis of pension system quality dimensions within the overall pension index (OPI in Sections 2.14 to 2.16). All three countries have highly developed funded pension components as integral elements of their overall pension systems. The historical chapter describes the historical and institutional pathways, that have led to a strong funded pension provision in these three countries. The historical overview precedes the country studies in order to take account for the fact that the institutional design of pension systems is also a result of historical developments and policy pathways.

Section 2.14 develops the above-mentioned scoreboard assessment of the quality dimensions of pension systems. The Overall Pension Index (OPI) comprises relevant quality criteria for the evaluation of pension schemes. The criteria were derived from the academic literature and the index comprises six relevant dimensions: adequacy, sustainability, affordability, equitability, robustness, and market capitalization. The “leading” countries are identified on the basis of the quantitative analysis of various quality criteria of pension systems. As mentioned, these are Sweden, Denmark and the Netherlands. The results of the OPI Index provide the basis for assessing the strengths and weaknesses of the pension systems in the 11 countries under review. The results of the cross-country analyses based on the OPI Index are summarised in the “Lessons learned from the OPI scoreboard assessment” in section 2.16.

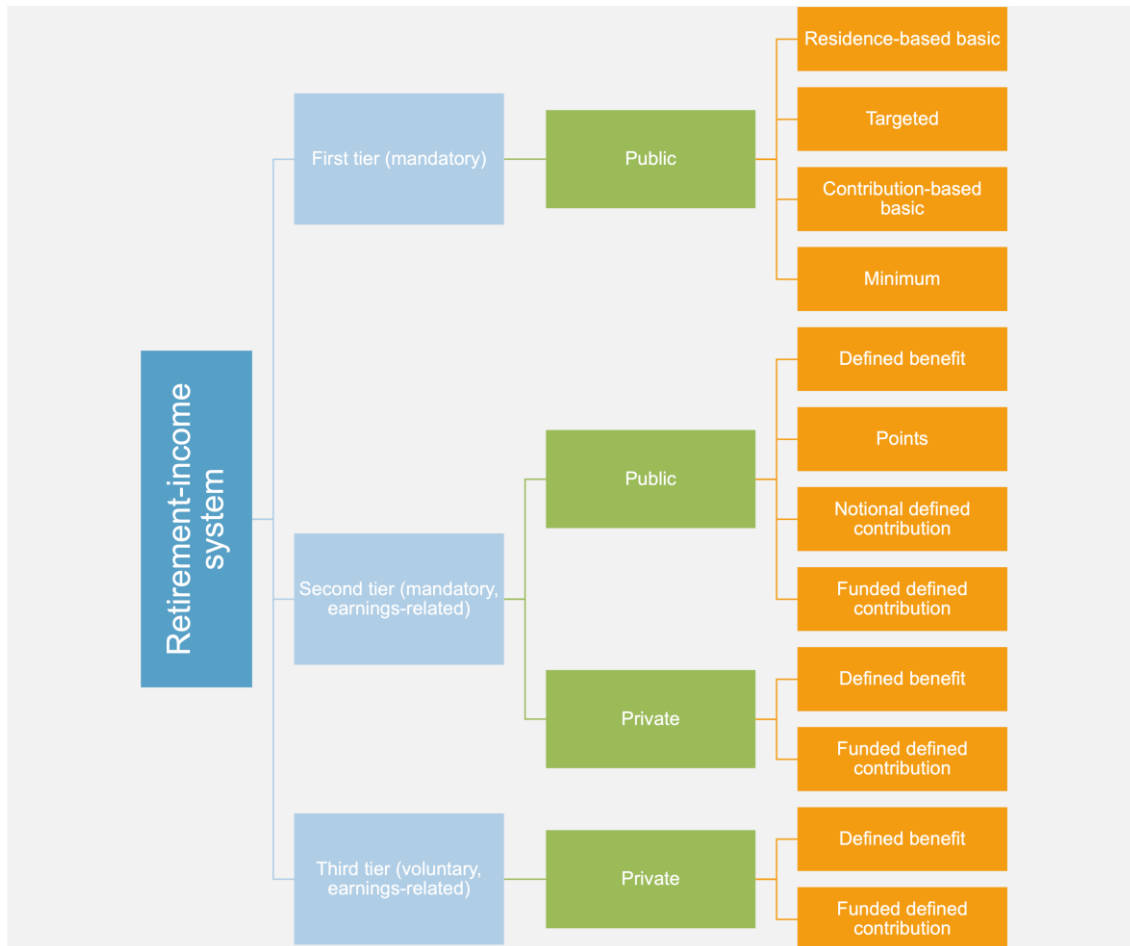
In Section 3, the study analyses the potential positive effects of funded pension systems on public finances and other economic output variables based on a computable general equilibrium (CGE) model EU-PuMA. By using a CGE model, we examine the broader economic impacts of different policy scenarios, considering the interdependencies of different sectors of the economy, i.e., the fact the savings are reinvested to stimulate e.g., innovation rates. The simulation of funded pension systems provides insights into the potential positive effects on the overall economy, including increased savings, higher investment levels, and increased productivity, leading to long-term economic growth.

Overall, this research project provides a comprehensive analysis of the long-term impacts of ageing populations on public finances, and the potential benefits of implementing funded pension systems.

2. Pension systems in selected European countries

2.1. Introduction and definitions

Figure 3: Three-tier architecture of retirement-income systems



Source: OECD

According to the classification systematic provided by the OECD, pension systems in Europe generally consist of three tiers (or pillars). The first tier includes programs that provide the first level of social protection in old age and for which past earnings are irrelevant in the calculation of retirement income. Such schemes often target an absolute minimum standard of living in retirement. Mandatory earnings-related components (second tier) help to smooth consumption and thus living standards between working life and retirement. Finally, the third tier consists of voluntary private pensions.

2.1.1. First tier

The first tier comprises of benefits that are a part of the public provision system and mostly do not depend on past earnings.¹ This tier can be classified into three categories: basic pensions, targeted pensions, and minimum pensions. Basic pensions may take two forms: a benefit based on residency or a benefit that is available only to those who have contributed during their careers. The benefit level may vary based on the duration of residency or the number of years of contribution, while it remains unaffected by the earnings level during the career. The eligibility for targeted plans is subject to certain residency criteria. The value of the benefit in these plans is dependent on income from other sources and may also be influenced by assets. As a result, pensioners with lower previous earnings receive higher benefit rates than pensioners with higher earnings. Minimum pensions may refer either to the minimum of a specific contributory scheme or to all schemes combined. In most countries, the value of the entitlement considers only pensions and does not test for other income. Minimum pensions either specify a minimum level of lifetime entitlement, which may increase if the contribution period's duration exceeds certain thresholds or are calculated based on minimum pension credits that determine the yearly entitlement of low earners based on a higher level of earnings (see OECD, 2021).

2.1.2. Second tier

The second tier of the pension system consists of both public and private earnings-related retirement income.² Public second-tier pensions can be classified into four types: **defined benefit (DB)**, **point system**, **notional defined contribution (NDC)**, and mandatory (private or public) **funded defined contribution (FDC)**. A defined benefit plan is a type of pension plan in which an employer/sponsor promises a specific pension payment, lump sum, or combination thereof at retirement that depends on an employee's earnings history, length of service, and age, rather than directly on individual investment returns. Such plans are most popular in OECD countries and are typically referred to as the classic pay-as-you-go (PAYG) system. The second type is the point system. Workers earn pension points based on their earnings. At retirement, the sum of pension points is multiplied by a pension point value to convert it into a regular pension payment. Third, there are notional defined contribution (NDC) schemes. These are also public pay-as-you-go schemes with individual accounts that apply a notional rate of return to contributions made, mimicking funded defined contribution (FDC) plans. The accounts are "notional" in that the balances exist only on the books of the administering institution. At retirement, the accumulated notional capital is converted into a monthly annuity using a formula based on life expectancy. The

¹ The classification largely follows the sources provided by OECD. In these sources, all forms of equivalence-oriented and income-related pensions are assigned to the 2nd tier. According to this understanding, the function of maintaining the standard of living through equivalence-oriented benefits is a defining criterion for 2nd tier pensions. The sources provided by the World Bank and also parts of the national and subject-specific sources differ from this understanding. In some sources, all types of PAYG systems, regardless of whether they only provide for flat-rate basic benefits or income-related systems, are included in the 1st tier or 1st pillar. Other sources, in turn, assign all forms of public and statutory systems to the 1st tier, regardless of the form of financing. There may be some inconsistency in the country studies due to the fact that the different sources and classification systems are not always congruent. Alternative classification models provided by the World Bank and by country-specific sources are described in section 2.1.5.

² This means that contrarily to the World Bank classification, not only occupational earnings-related pensions are classified as second tier.

most important aspect that distinguishes NDC systems from other PAYG systems (such as DB or points systems) is the fact that both demographic and economic changes are reflected immediately. If the economy grows at a slower rate, the notional returns decrease, and if the life expectancy of the population increases, it implicitly decreases the size of their pension. However, NDC, like the other pay-as-you-go systems, is financed by contributions from the current generation of workers and is therefore still heavily influenced by population aging. Finally, funded defined contribution (FDC) plans are mandatory for future retirees in 12 OECD countries. In these schemes, contributions are made to an individual account. The accumulation of contributions and investment returns is usually converted into a monthly pension at retirement. In summary, three types of pay-as-you-go systems can be distinguished among public and mandatory private second-tier schemes, with the NDC system being more sustainable (i.e., more responsive to population aging) than the point and DB systems. Finally, the public and private mandatory FDC systems are based on individual investment accounts.

Second-tier schemes have different characteristics depending on the type of scheme. DB schemes typically have a nominal accrual rate, expressed as a percentage of individual pensionable earnings, at which benefit entitlements build up for each year of coverage. The higher the contribution rate, the higher the accrual rate that can be supported by contributions. In point systems, the pension benefit is equal to the number of points accumulated during the career multiplied by the point value. FDC schemes apply an annuity divisor to convert the accumulated capital in the individual account into a monthly pension benefit at retirement age. NDC schemes do the same with notional accumulated capital (OECD, 2021). **The nominal accrual rate** is an important parameter of DB systems. It is expressed as a percentage of individual pensionable earnings. In some countries, these accrual rates are constant, while in others they vary by earnings, age, or years of service. Higher accrual rates put more strain on the financial sustainability of the system and are only possible with high contribution rates, which usually imply high levels of taxation on labor. The second important parameter of second-tier systems, applicable to DB, points and NDC systems, is the **earnings measure**, i.e., the basis for calculating earnings-related pensions. Most countries use full career earnings, while some use only some final years before retirement or best years of earnings. The use of best or final years (which tend to be higher than other years) is typically associated with less sustainable funding. All schemes apply a **valorization** rate to past earnings to take account of changes in "living standards" between the time pension rights are accrued and the time they are claimed. The most commonly used rate is the growth in average earnings. In some countries, pension rights are only adjusted for price inflation, which means that nominal wage growth in excess of inflation leads to a reduction in replacement rates.

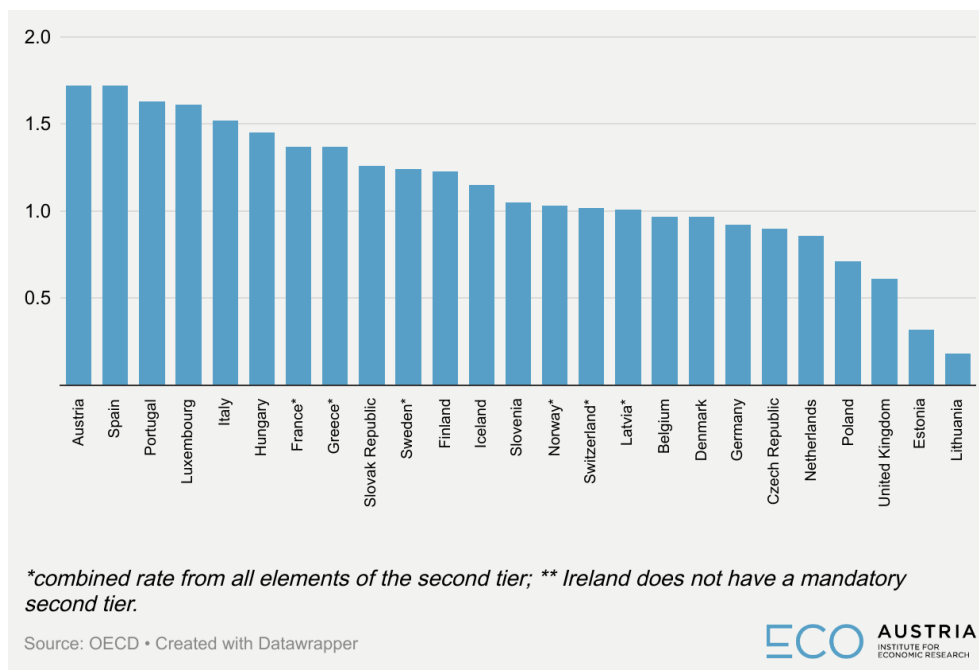
A counterpart to valorization in DC schemes (both NDC and FDC) is **the interest rate** applied to contributions paid. It is based on financial market returns in FDC schemes and on notional interest rates in NDC schemes. For public NDC schemes, an important element is how to mimic financial returns. This is usually done using GDP growth or wage growth as a proxy for financial market performance. In addition, **the contribution rate**, i.e., the percentage of income paid into the DC system, is also important.

Another concept is **indexation**, which refers to the growth of current pension payments. Most commonly, current pensions are indexed to prices, while some countries index pension payments to nominal wage growth or to a mix of price and wage growth.

Finally, most countries set a ceiling on the earnings used to calculate pension benefits, expressed as a multiple of average wages. In most OECD countries, this level is above average wages, except in Israel and Switzerland.

All those elements of the system define the **effective accrual rate**, measuring the rate at which benefit entitlements are built for each year of coverage. For the DB system it is equal to the nominal accrual rate corrected for the effects applying to pensionable earnings. In FDC and NDC schemes the effective accrual rate depends on contribution rates, rates of returns and annuity factors. For the European OECD countries, effective accrual rates vary between the lowest 0.18% in Lithuania and the highest 1.72% in Austria (compare Figure 4).

Figure 4: Effective accrual rate of a male full-career average earner (% of earnings)



Other important characteristics of pension systems relate to the level of benefits. We can define **replacement rates** and **benefit ratios**. The replacement rate is defined as the individual pension entitlement divided by pre-retirement earnings. It thus measures the extent to which individual income levels can be replaced in retirement. On the other hand, the benefit ratio is defined as the ratio between the average (public) pension benefit and the average wage in the economy as a whole.

2.1.3. Third tier

The third tier consists of individual pension products, such as an annuity or a tax-efficient blocked savings account. These are mainly used by the self-employed and employees in sectors without

a collective pension scheme but are becoming more important and popular as the sustainability problems of the first tier and the unfunded second tier increase. Individual pension products can be purchased from investment companies, insurance companies or banks. These third-tier products are generally funded (in most countries it is illegal to offer unfunded private pensions) and follow a similar logic to second-tier funded products, i.e., they can be organized as either defined benefit or defined contribution schemes. There may be different ways in which countries encourage saving in the third pillar, e.g., through tax reliefs, subsidies or guarantees.

2.1.4. Unfunded vs. funded systems

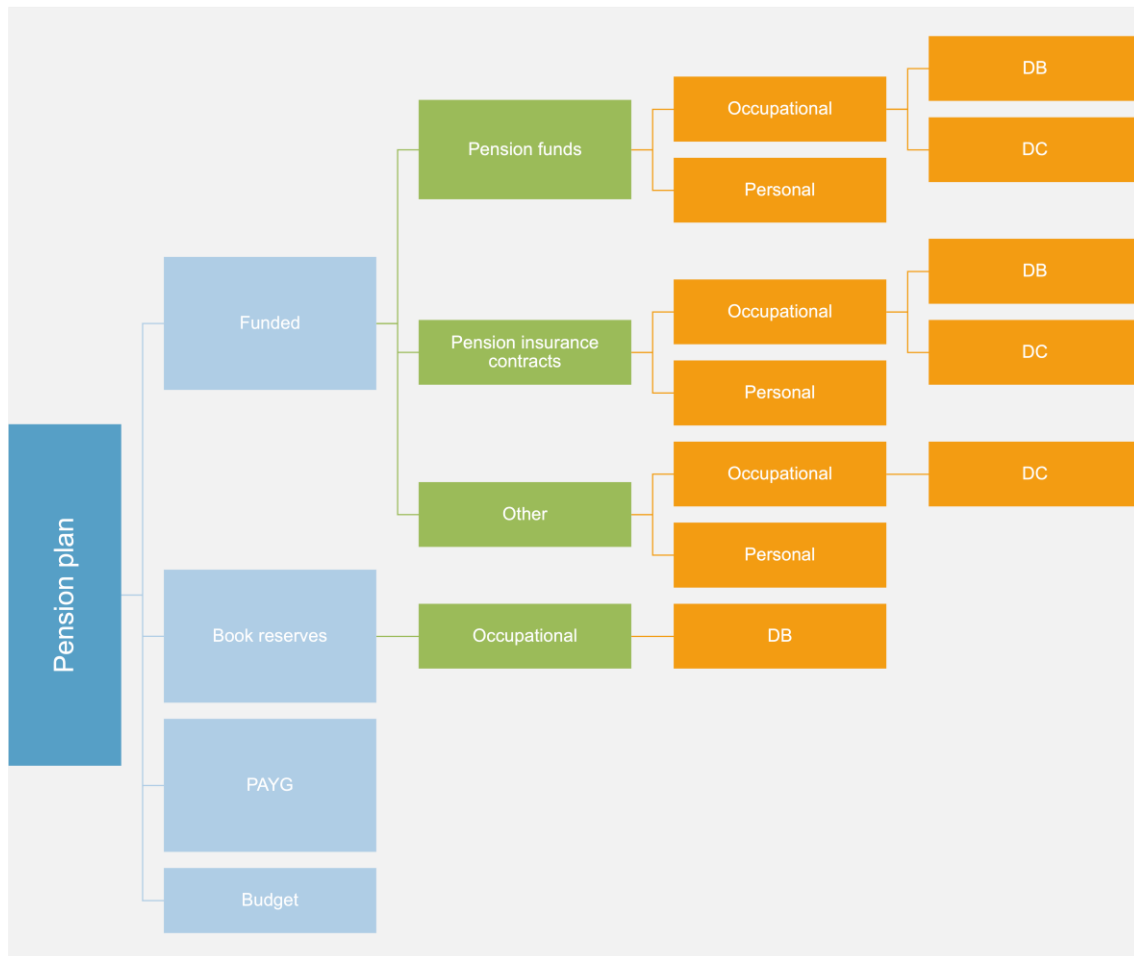
While the tier structure corresponds to the distinction between mandatory and voluntary schemes, it makes sense to distinguish between funded and unfunded systems, while the latter follow similar patterns irrespective of them being mandatory, quasi-mandatory, organized as opt-out systems or purely voluntary. From this perspective it is relevant to analyze the distinctions between how particular plans are organized (see Figure 5).

In funded plans, members earn rights or accumulate assets for their retirement through their contributions or their employer's contributions during their working lives. These assets are legally separated from the plan sponsors. Members have a legal or beneficial right or other contractual entitlement to these assets. Funded vehicles include pension funds, insurance contracts and other plans. **Pension funds** are typically managed by trusts, pension management companies or similar entities and represent a pool of segregated assets that form a separate legal entity. **Pension insurance** is provided by insurance companies. When pension insurance contracts are used for retirement savings, individuals or employers pay premiums to insurance companies. Insurance companies manage the assets from these premiums (or contributions) together with those from their other insurance activities. Other products typically refer to retirement savings products offered by banks or investment companies. Individuals or their employers may open or purchase retirement savings products offered and managed by banks or investment companies, such as individual retirement accounts (IRAs) in the United States.

A further distinction can be made between **occupational** and **personal** plan types. Employers (from the public or private sector) may set up funded plans on behalf of their employees. In such cases, the plans are considered as **occupational**. When individuals choose and set up plans themselves with a dedicated provider, the plans are **personal**.

Finally, where the employer is responsible for guaranteeing a benefit or return to plan participants, such occupational plans are referred to as **defined benefit (DB) plans**. The benefit promise may be a pension calculated on the basis of several parameters (e.g., salary, length of service) or an investment return. In the former case, the plans are referred to as traditional DB plans, while in the latter case they are referred to as hybrid DB plans. If another party (e.g., an insurance company) provides a guarantee, the plans are considered to be **DC protected**. Otherwise, if there is no (fixed) guarantee, the plans are **DC unprotected**.

Figure 5: Features of pension plans



Source: OECD 2022.

A final element of quasi-funded pension plans is the book reserve. Unlike funded plans, employers' book reserves are not legally segregated from the employers. As a result, employees' accrued pension rights may be at risk in the event of the employer's insolvency. Some countries with this type of occupational pensions have established insolvency guarantee schemes. Other countries encourage or require employers to take out credit insurance in the event of bankruptcy.

Funded pensions can be subject to different tax regimes. Taxation of such benefits occurs most often in three situations:

- at the stage of payment of insurance premiums – typically the premiums do not reduce the tax base for personal income tax, and the premiums paid by the employer are added to the employee's income,
- the generation of income by pension funds - the latter on the surpluses earned usually with a flat-rate income tax,
- benefit payments - most often taxed on a general basis or in the form of a lump-sum capital gains tax.

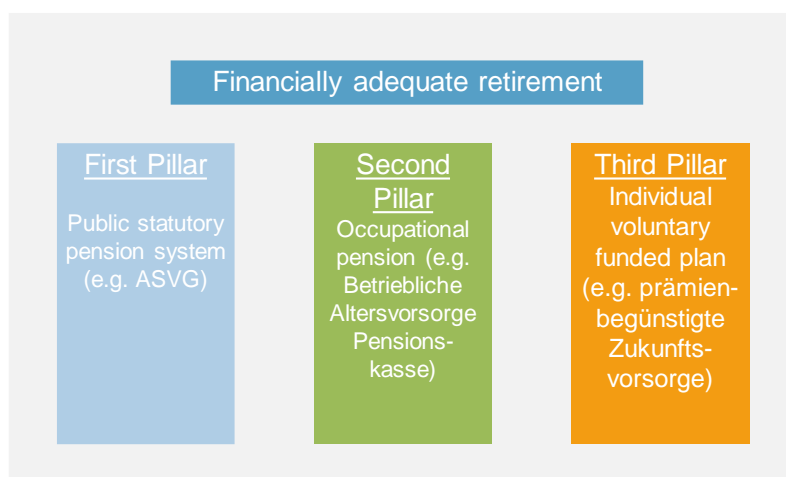
For each element it can be taxed “T” or exempt “E”, which allows to classify the taxation system in a way that combines the element with the taxation, e.g., TEE or EET.

2.1.5. Alternative classification of pension schemes

The classification structure in this report largely follows the OECD three-tier structure. In these sources, all forms of equivalence-oriented and often occupational earnings-related pensions are assigned to the 2nd tier or 3rd tier, depending on the mandatory nature of participation. According to this understanding, the function of maintaining the standard of living through equivalence-oriented benefits is a defining criterion for 2nd tier pensions whereas 1st tier pensions only provide for flat-rate basic pensions in order to prevent from old-age poverty. The function of maintenance of living standard can either be based on PAYG systems as in Austria (e.g. NDC or point systems) or on funded and often occupational pension schemes as in the Netherlands.

Dependent on the structure of the particular national pension scheme, national and country specific classifications might deviate from the OECD structure. The country-specific classification systems for Austria – and also for Germany – usually distinguish between 3 pillars of the pension system (Figure 6). For example, the Austrian Association of pension and retirement funds (“Vorsorgeverband” or Fachverband der Pensions- und Vorsorgekassen) assigns pension provision under the public and statutory PAYG pension system to the first pillar.

Figure 6: Classification by the Austrian Vorsorgeverband



The classic form of ASVG personal pensions in Austria here thus fall under the first pillar of the pension system, as do civil servant pensions, widows' and orphans' pensions. The occupational pension scheme was introduced as the “second pillar of the Austrian pension scheme” and, in contrast to the statutory pension, was created as a privately organized and managed model. The third pillar includes individual savings plans, such as those offered on the market in the form of “prämienbegünstigte Zukunftsvorsorge”. The third pillar also includes other formal and informal forms of retirement provision, for instance common personal savings books, stock options and share capital, income from renting. The Germany Pension Insurance (“Deutsche Rentenversicherung”) provides a rather similar three pillar model for the Germany pension

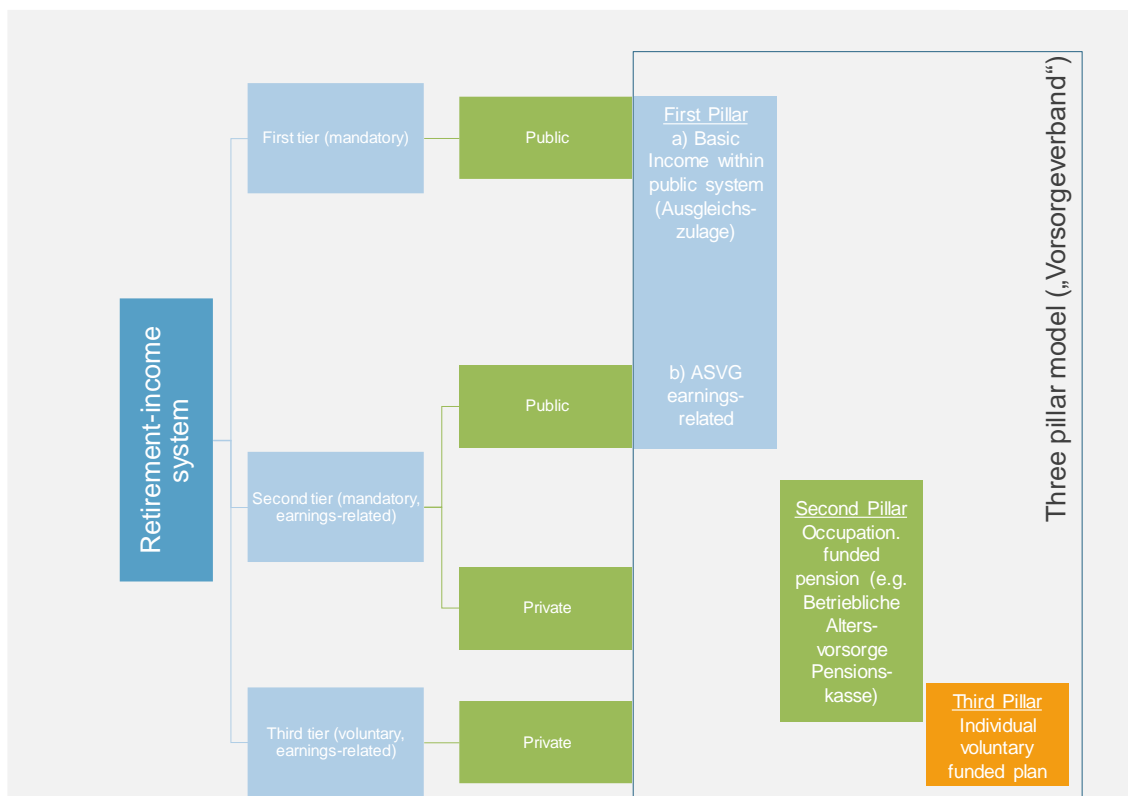
system.³ Here, the statutory pension provision is allocated to a first pillar of the so-called standard provision ("standard provision"), the company pension provision to a second pillar and individual private provision (e.g. "Riester" plans) to a third pillar. The second and third pillars are not mandatory (legally binding for all employees) and have a supplementary character.

The country specific classifications by "Vorsorgeverband" in Austria or the "Deutsche Rentenversicherung" in Germany are unsuitable for the international overview in the context of this study. Two reasons are relevant: First, pension system designs vary widely across the 11 countries considered. Not all of these systems can be integrated into the three-pillar model in parallel to the Austrian or German system. Secondly, the structure in the 3 pillars does not contain any information about the functions of old-age security that are fulfilled in the different pillars. For example, the Netherlands, similarly to Germany or Austria, has a public statutory PAYG component. The Dutch PAYG scheme does however not comprise any elements of earning-relatedness. The Dutch PAYG component does not fulfill the "typical" and "bismarckian" function of securing the standard of living as the PAYG systems in Germany and Austria. Conversely, the availability of occupational funded pensions in the second pillar and the availability of individual funded pensions in the third pillar say nothing about the scope and mandatory nature of these funded pension forms. The degree of integration into an overall pension system remains unclear. In the Netherlands and Denmark, occupational funded pensions are anchored in the second pillar in most collective agreements at industry level. Though not legally binding or obligatory, these systems reach a high coverage of more than 90% of the working population. They are quasi-mandatory and provide for the maintenance of living standards. This is not the case in Austria or Germany. Even if occupational pensions are provided for in some collective agreements, comparable coverage levels are far from being achieved in Austria or Germany. In this respect, although occupational and individual pensions are available in Austria and Germany in the second and third pillars and can be combined with standard pensions, they do not represent a systemic and (quasi-)mandatory integrated component of the overall pension system. This is a significant difference to the Netherlands or Denmark. Here at least the second pillar of occupational pensions represents an integrated and mandatory system component.

Figure 7 attempts to integrate the Austrian three-pillar model into the OECD classification scheme. The public pension system of the first pillar fulfils a dual function. It takes on the function of a minimum security of basic income in the form of the so-called "Ausgleichszulage". At the same time, earnings-related benefits are provided for in the PAYG based public pension system. Here, consistent with the OECD definition, the functions of 2nd tier pensions are fulfilled in the form of PAYG pensions. The pensions of the second occupational pillar are assigned to the 2nd or 3rd pillar, depending on whether the organization of occupational pensions is mandatory or not in the collective agreement regulations. Finally, 3rd pillar individual pensions are identical to the 3rd tier of the OECD system.

³ Information is available via the Website of „Deutsche Rentenversicherung. ([Weblink](#)).

Figure 7: Integration of the Austrian three pillar model into the OECD three tier model



In contrast to the OECD three tier model the World Bank applies a five-pillar model in order to classify the structure of overall pension systems. Accordingly, the authors of the World Bank (Holzmann & Hinz in World Bank, 2008) distinguish between a:

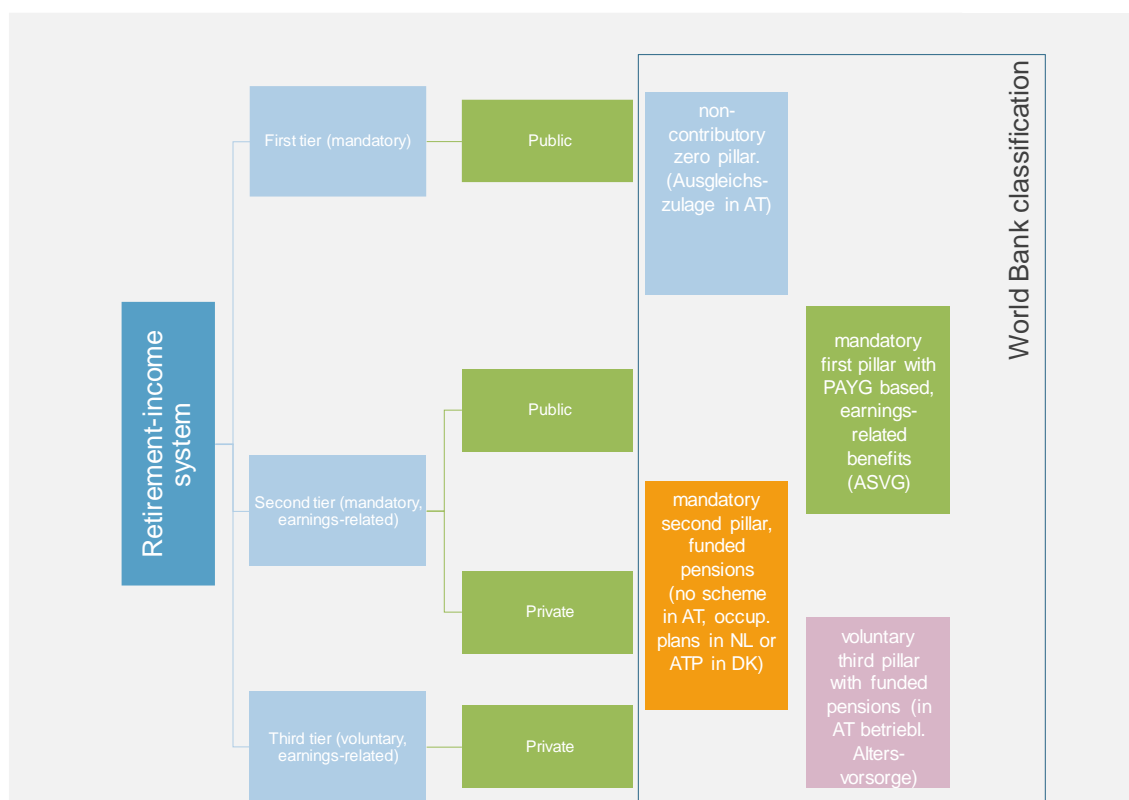
- non-contributory “zero pillar”,
- a mandatory “first pillar”,
- a mandatory “second pillar”,
- a voluntary “third pillar” and
- a non-financial “fourth pillar”.

The non-contributory “zero” pillar is consistent with the first pillar under the OECD model. The aim of this pillar is to prevent poverty in old age. Benefits are independent from labour market participation. The zero pillar provides a minimum old-age income at a basic flat-rate level. This ensures that people with low lifetime incomes are provided with basic protection in old age. Examples for non-contributory zero pillar benefits are the “Ausgleichszulage” in Austria or the public basic pension in the Netherlands.

The mandatory “first pillar” is financed by contributions linked to varying degrees to earnings with the objective of replacing some portion of lifetime pre-retirement income. These schemes are typically financed on a PAYG basis and thus are, in particular, subject to demographic and political risks. Benefits are earnings-related and reflect the level of contributions of the insured. An example are standard pension benefits within the framework of the public statutory schemes in Austria or Germany.

Mandatory “second pillar” schemes are typically based on individual savings accounts. This pillar comprises a wide set of design options including active or passive investment management, choice parameters for selecting investments and investment managers, and options for the withdrawal phase. Put simply, the second pillar includes all forms of individually assignable funded plans, depending on whether they are mandatory or not. In Austria and Germany there are actually no such forms required by law. In Poland, employees are automatically enrolled in such an individual FDC pension scheme. This takes the form of the PPK scheme (“Pracownicze programy kapitałowe”). In the Netherlands, the occupational funded pensions, which are provided for in most collective agreements depending on the industry, most closely correspond to such mandatory “second” pillar schemes. This also applies to the Danish ATP system (“Arbejdsmarkedets Tillægspension”), which is mandatory for employed persons.

Figure 8: Integration of the World Bank five pillar model into the OECD three tier model



Voluntary “third pillar” schemes correspond to all forms of individually assignable pension plans if they are voluntary and not mandatory. They can take different forms, for example individual savings for retirement or also for disability, they may be organised in the form of a company level, they may be employer sponsored or completely individual and private. In Austria, both the occupational pension plans provided by "Betriebskassen" (second pillar according to the three-pillar model) and individual plans within the framework of "prämienbegünstigte Zukunftsvorsorge" (third pillar) correspond to this voluntary third pillar component. The same applies to occupational pensions in Germany, depending on whether they are anchored in mandatory collective agreements, as well as to voluntary individual forms of old-age provision such as “Riester” contracts.

A non-financial “fourth pillar” which includes access to informal support, such as family support, or other formal social programs (for example health care or long-term care programs) and other individual financial and non-financial assets (such as home ownership and income from mortgages and similar). Forms of pension provision in this fourth pillar are not an integrated part of the pension system in the countries considered below. The fourth pillar is therefore not relevant in the following 11 country studies.

As mentioned, the classification structure in this report largely follows the OECD three-tier structure. However, the country studies are partly based on national sources, which assume a different structure. In the interest of standardisation, components and elements that refer to the OECD model are conceptually described as “tiers” and those that refer to the World Bank system are named as “pillars”.

2.2. The politics of public pension reforms

The following section describes the design and institutional background of pension systems for 11 European countries. In preparation for the country studies, it is important to understand the pension systems in their historical development. The design of pension systems is often the result of gradual parametric reforms. A particular institutional structure therefore often exhibits a high degree of institutional path dependency. This is due to institutional, political and economic restrictions: Once a system is established, systematic and “non-parametric” reforms would produce winners and losers. It is important to bear in mind that once a system is established, institutional lock-in effects often contribute to a fundamental persistence and maintenance of its institutional features. However, the following section describes historical development and trajectories for Sweden, Denmark and the Netherlands. These systems achieve the best results in the Overall Pension Index and in the scoreboard assessment in sections 2.15 and 2.16. These three countries achieve good results in terms of both sustainability and adequacy, while for the other countries a trade-off and a negative correlation between adequacy and sustainability can be observed. Such a conflict of objectives is particularly evident for those countries that have a strong focus on PAYG components. The results of the OPI scoreboard assessment suggest that the interaction of the different financing systems and the institutional integration of PAYG components and funded components is a major advantage of these three countries.

Introduction

The historical origin of public pension schemes is the starting point of differentiation and understanding more recent reforms in selected countries, namely Bismarck versus Beveridge systems. Bismarck countries are those in which, the development of modern social policy was founded on the social insurance principle, which results in status maintenance having priority over poverty prevention. The opposite is the case for the Beveridge countries. In these countries a universal, tax or contribution-financed basic pension system was established, with the main goal of guaranteeing a minimum below which one cannot fall but without an explicit goal of sustaining the previous standard of living upon the end of the working life. Bismarck countries are in particular Austria and Germany, while Sweden, Denmark and the Netherlands can be assigned to Beveridge countries. However, as explained by Hinrichs (2000), those countries have

undergone several reforms. The *early birds* countries, among those Sweden, have early on (Sweden in 1959) established a second public pillar, which was contribution-based, unfunded (at least in principle), yielded an earnings-related supplementary pension and included redistributive provisions in varying degrees. As these complementary pension insurance schemes matured, the relevance of the 'basic pension' pillar declined in relative or even absolute terms. In effect, these four countries thus metamorphosed into Bismarck countries (Hinrichs, 2000). On the other hand, the latecomers, including the Netherlands and Denmark, have established a public complementary pension system only in the 1970s. In these countries the second pillar is funded and private, but – to protect the employees who orient their strategies of retirement provision toward those benefits – publicly regulated and controlled. In the Netherlands and Denmark, the generalisation of the second pillar was predominantly the result of union pressure.

Sweden

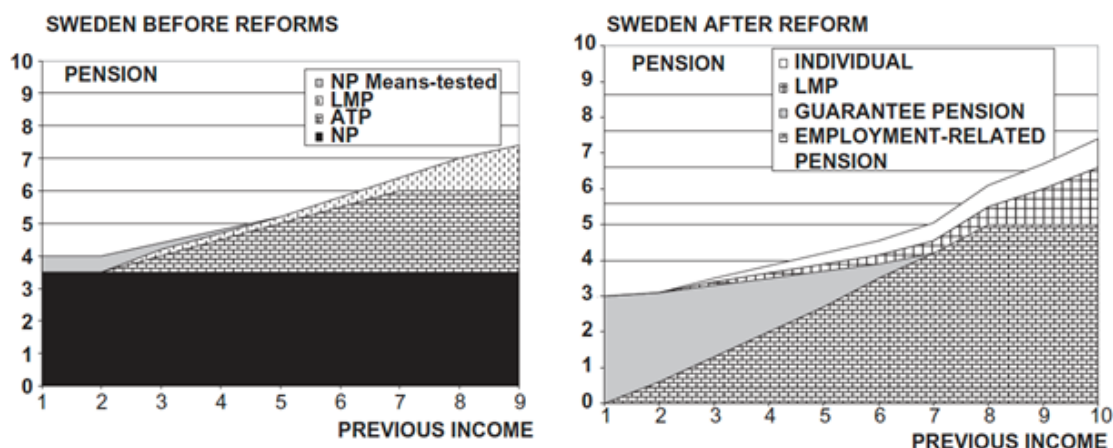
By the mid-1950s a comprehensive national pension system that guaranteed security to every citizen had been established in Sweden but industrialization after the Second World War has required changes to the system, to account for the growing sectors of labourers. The debate on and the making of the supplementary pension scheme was a highly politicized affair. The non-socialist parties advocated either a universal flat-rate scheme proposed by the Centre Party or voluntary occupational pensions proposed by the Conservatives, whereas the Social Democratic Party (SAP) insisted on a compulsory, legislated and state-run scheme. In 1959, the parliament accepted the SAP model that included a generous universal national pension (NP) supplemented by earnings-related pensions (ATP) that guaranteed a full pension (after 30 years in employment) based on the earnings of the 15 best years (the 15/30 rule). In the average income groups the replacement level was 65–70 per cent of previous income (Kangas et al, 2010). The lion's share was kept in the public domain.

By the late 1970s it became clear that the 15/30 rule resulted in benefits which were too high compared to the contributions and the economic sustainability of the system was eroded. For the leaders of the unions, the political problem was the fact that the ATP system was identified as a "win over the bourgeoisie", and abolition or reform would constitute a betrayal of the socialist values. After 1991 general election a new centre-right government was formed (consisting of the Moderates, Liberals, Centre Party and the Christ-Democrats). This opened a window of opportunity for "blame-avoidance" (Kangas et al, 2010). Furthermore, by including the unions in the reform process, the government gave it the opportunity to portray itself as a protagonist of the basic values and representing them within the reform group. Their main demand was to portray the reform as a reformation and not abolition, for face-saving purposes. Crucially, familiar concepts and terms of the old system were used.

The reform abolished the old universal national pension and established a new guaranteed pension tested against other legislated pensions (Figure 9). Second, it transformed the system from one of defined benefits to one of defined contributions. Third, it abandoned the 15/30-year rule. Fourth, it created a shift toward flexible and delayed retirement. In addition to these principal changes in the public pay-as-you-go system, the committee proposed that a small part of the individual worker's lifetime earnings should be set aside and transferred into a separate fully-

funded pension scheme using individual accounts (Anderson 2001; Palme 2003; Anderson and Immergut 2007).

Figure 9: Pensions in Sweden before and after the 1990s/2000s reforms



Note: The vertical axis pertains to the hypothetical amount of pension. The horizontal axis indicates the size of the previous earnings. The black 'NP basic' illustrates the universal part of national pension, while the grey 'NP means-tested' refers to that part of national pension that depends on other (pension) income. 'LMP' is labour market contractual pensions and 'ATP' is legislated employment-related pension. 'Guarantee pension' is the replacement of the old NP in Sweden, and 'Individual' is an abbreviation for individual pensions.

Source: Kangas et al (2010)

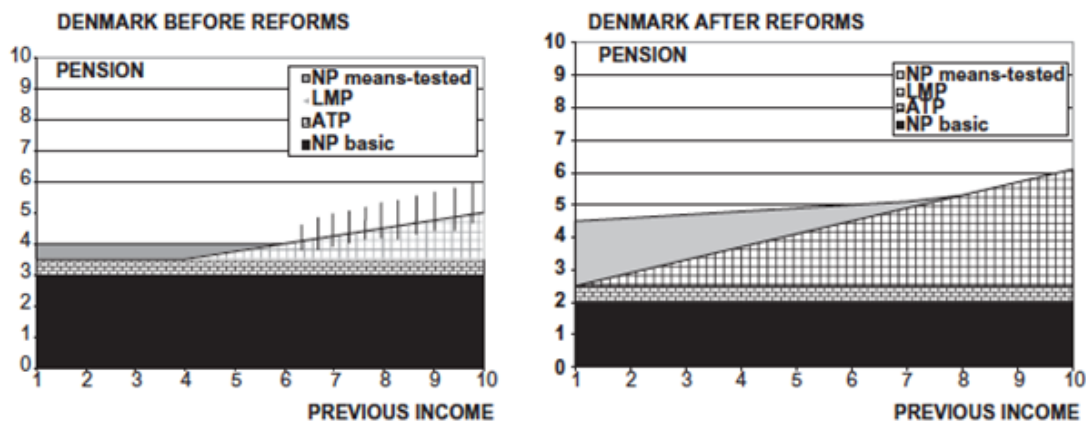
Denmark

In Denmark the first initiatives for earnings-related supplementary schemes were taken in the early 1960s. In contrast to the other Nordic countries, the Danish ATP scheme was a flat-rate system where benefits were related to the number of years in employment. The unions were opposing any kind of earning-related schemes which would preserve the labor-market inequalities, which is why no "Swedish-type" supplementary system was introduced. The concentration on improvements in the national pension system in Denmark gradually led to a generous model of basic security in which national pensions contributed up to 50 per cent of the average net wage. Crucially, because of the flat-rate characteristics of the legislated pensions the upper-middle and higher-income groups tried to satisfy their needs for pension security by occupational benefits (LMP), which was when the occupational pensions started to flourish.

In the 1980s the discussion of the Danish pension system was triggered by the inequality between the basic pension receivers and those covered by the funded occupational schemes. One reason for this inequality was that the severe economic situation in Denmark in the early 1980s made interest rates extremely high, and while contributions to the different kinds of supplementary pension schemes were tax-deductible, interest on these savings was not taxed (Kangas et al, 2010). This resulted in very high payments from the occupational schemes, including above 100 per cent of the net contributions. To tackle the inequality the 1982 government of the conservative Prime Minister Poul Schlüter introduced a tax on pension savings which resulted in massive revenue for the state. The second reason which led to the Danish pensions reform was related to economic conditions: given a negative balance of payments, the government wanted to improve

the competitiveness with low wage growth during the (at the time) centralized wage negotiations. Thus, the unions had a vast interest in searching for other sources of income for their members. The pressure from several strong trade unions, particularly the Union of Danish Metalworkers (Dansk Metal, DM), led to decentralization of the 1987 negotiations. This change made it possible for individual unions to get a separate agreement on pensions covering only their members and creating selective incentives for joining trade unions (Due and Steen Madsen 2005). In the 1991 negotiations, the DM made an agreement with its employers on a decentralized pension and funded system covering only those workers who signed up for this specific agreement. The new pension scheme was to be managed by a board with equal representation from employees and employers. This compromise allowed the employers to support the new pension arrangement because they would be able to influence the investments made by the pension fund. Afterwards many other trade unions copied the DM pension agreement in their negotiations. These negotiated agreements started the avalanche of occupational pensions (Kangas et al, 2010).

Figure 10: Pensions in Denmark before and after the 1980s/1990s reforms



Note: The vertical axis pertains to the hypothetical amount of pension. The horizontal axis indicates the size of the previous earnings. The black 'NP basic' illustrates the universal part of national pension, while the grey 'NP means-tested' refers to that part of national pension that depends on other (pension) income. 'LMP' is labour market contractual pensions and 'ATP' is legislated employment-related pension. 'Guarantee pension' is the replacement of the old NP in Sweden, and 'Individual' is an abbreviation for individual pensions.

Source: Kangas et al (2010)

Netherlands

Similar to Austria or Germany, the Netherlands also introduced a public PAYG pension system in the 1950s. This scheme is the mandatory public AOW scheme, named after the law that forms the pension system ("Algemene Ouderdomswet" or General Old Age Pensions Act). Due to a missing capital stock after the war, but also due to the prospect of economic growth, increasing productivity and wages as well as a "favourable" demographic structure, PAYG was the "natural" form of pension financing in the 1950s. Another reason highlighted by authors is a "first generation's gift": Introducing a PAYG system had the political advantage that people who were already retired could benefit from the system without having contributed to it (Haverland 2001, 314).

Despite the historical similarities, there are substantial structural and especially functional differences between the Dutch “Beveridgian” type and the more “Bismarckian” counterparts in Austria or Germany. The main difference was, the Dutch AOW provided flat-rate benefits to all residents, retired or not, from age 65. The AOW system was universal and inclusive but did not provide earnings-related benefits. Benefits were linked to the minimum wage. In contrast, the public PAYG systems in Austria or Germany provide earnings-related benefits and ensure living standards, at least to a certain extent and depending on the insurance record. The prospect of maintaining living standards after a lifelong career, which the PAYG schemes in Germany or Austria offered early on, decreased the incentives for supplementary pensions (Haverland 2001, p. 315). The pressure towards additional occupational pensions was much greater in the Netherlands, because of the flat-rate character of AOW benefits. Therefore, the different functionality is one of the main reasons for different historical developments and trajectories (Haverland 2001). Already in the 1990s, the first PAYG tier provided only 45% of pension income in the Netherlands, while in Austria or Germany the provision of old-age income was still relying to a much greater extent on PAYG.

But even compared to the Beveridgian pensions systems in the UK or in the USA, the Dutch pension system is still more “special” and has a hybrid character. The Dutch social policy and welfare regime is a mix of earnings-related Bismarckian and universalistic Beveridgian elements. An important institutional element of this welfare state model is highly institutionalized form of social partnership. Corporatism forms an integral part of the Dutch welfare state regime and its historical development since the Second World War (Curtis 1987). Accordingly, the Dutch AOW pensions system was initially intended only part of a multi-tier pension model. In the 1950s, as an outcome of a series of political discussions between Socialist, Catholic and Protestant parties as well as employer organizations and trade unions, a fragmented system of universal “people’s insurance”, earnings-related worker’s insurance and means-tested social provisions emerged. The General Old Age Pension Act that introduced the AOW in 1957 was the first comprehensive Dutch policy that followed Beveridgian lines. On the other hand, keeping with the “corporatist” tradition, the occupational pensions were negotiated between employer organizations and trade unions. As early as 1947, government regulations made the negotiated supplementary pension provisions compulsory for all firms in a sector, also in order to prevent distortions of competition. Already in 1953, five years before the introduction of the General Old Age Pension Act, around two thirds of the employees were covered by occupational pensions (Haverland 2001). Quasi-mandatory funded occupational pensions become even more relevant in the 1960s and 1970s. Although the AOW basic pension has been steadily expanded in these two decades, its flat-rate oriented design remained too “weak” to allow for a reasonable income replacement, especially for the middle and higher-income groups. Accordingly, employees pushed for supplementary occupational pensions. In parallel with the expansion of the public AOW system, this led to also an increase of the coverage and generosity of funded occupational pension schemes.

The “golden area” of expanding welfare and pension systems in the 1960s and 1970s was followed by a phase of cost-dampening policies in the 1980s and 1990s. Exemplary for this area was a decoupling of the minimum wage, which serves as an institutional target for AOW pension benefit, from the development of real wages and the linkage of the minimum wage to the

contractual wage development in the private sector. These policies led to a decreasing generosity of the public PAYG scheme in the Netherlands. Substantial cuts were compensated by the increasing importance and coverage of funded occupational pensions (Haverland 2001, p. 317). For employees who were already insured in occupational pension plans, the retrenchment of the AOW scheme did not matter because the overall benefit target remained constant. In the 1980s and especially the 1990s, similar cost dampening policies could also be observed in Germany and Austria. In the Netherlands, however, these policies had a transition effect as they moved the entire pension system further towards a more funded pension provision.

2.3. Austria

2.3.1. Demographic profile and demographic forecast

Table 1: Austria: demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	8,882	9,159	9,297	9,345	9,290	9,247	8,882 → 9,247
Population growth rate	0.5	0.2	0.1	0.0	-0.1	0.0	0.5 → 0
Old-age dependency ratio (pop 65+ / pop 20-64)	30.7	40.3	48.2	51.5	54.8	55.9	30.7 → 55.9
Old-age dependency ratio (pop 75+ / pop 20-74)	13.3	15.5	20.9	25.0	25.8	28.0	13.3 → 28
Ageing of the aged (pop 80+ / pop 65+)	27.3	29.0	31.3	40.0	39.1	41.7	27.3 → 41.7
Men - Life expectancy at birth	79.8	81.2	82.6	83.9	85.2	86.3	79.8 → 86.3
Women - Life expectancy at birth	84.3	85.7	86.9	88.1	89.2	90.2	84.3 → 90.2
Men - Life expectancy at 65	18.8	19.8	20.8	21.8	22.7	23.6	18.8 → 23.6
Women - Life expectancy at 65	21.8	22.9	23.9	24.8	25.7	26.6	21.8 → 26.6
Men - Survivor rate at 65+	87.4	89.4	90.9	92.2	93.3	94.3	87.4 → 94.3
Women - Survivor rate at 65+	92.8	94.0	94.8	95.6	96.2	96.7	92.8 → 96.7
Men - Survivor rate at 80+	60.5	65.7	70.0	73.9	77.3	80.3	60.5 → 80.3
Women - Survivor rate at 80+	75.8	79.5	82.4	84.9	87.1	89.0	75.8 → 89
Net migration (thousand)	44.3	31.3	29.4	27.2	26.4	25.5	44.3 → 25.5

Source: European Commission • Created with Datawrapper

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According to the demographic forecast for Austria (Table 1), the population will grow to about 9.3 million by 2040 and remain at that level until 2070. However, the composition of the population will change dramatically in the coming years. From the current old-age dependency ratio (the ratio of the population aged 65 and over to the population aged 20 to 64) of 30.7%, it will rise by almost ten percentage points to 40.3% in 2030 and further to about 50% thereafter. In addition, the "ageing of the aged" indicator, i.e., the ratio of the over-80s to the over-65s, will rise from 27.3% today to more than 40% in the longer term, reflecting the sharp increase in life expectancy. All indicators of life expectancy, both at birth and at age 65 for both men and women, are expected to increase sharply, reaching an average of more than 90 years for women in 2070. In addition, more than 90% of both men and women are expected to survive to the age of 65, and more than 80% are expected to survive to the age of 80 in 2070, with almost 90% of women surviving to the age of 80+. Finally, net migration is expected to decline from current levels, putting additional pressure on old-age dependency ratios.

Table 2: Austria: exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labor market exit age (CSM) – Men	63.2	63.2	63.2	63.2	63.2	63.2	63.2 — 63.2
Duration of retirement – Men	20.3	21.4	22.5	23.5	24.4	25.3	20.3 — 25.3
Percentage of adult life spent in retirement – Men	31.0	32.1	33.2	34.2	35.1	35.9	31 — 35.9
Early/late exit – Men	3.7	2.5	2.1	2.4	2.2	2.3	3.7 — 2.3
Average labour market exit age (CSM) - Women	61.4	62.6	63.2	63.2	63.2	63.2	61.4 — 63.2
Duration of retirement - Women	25.3	24.6	25.6	26.6	27.5	28.4	25.3 — 28.4
Percentage of adult life spent in retirement – Women	36.8	35.6	36.2	37.1	37.8	38.6	36.8 — 38.6
Early/late exit - Women	0.5	2.2	1.9	1.8	1.6	1.8	0.5 — 1.8

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

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Despite increasing life expectancy, the average labor market exit age for males is not expected to rise until 2070 (Table 2). The average exit age for women is expected to rise to 63.2, the same as for men, because of recent reforms. Due to higher life expectancy, the duration of retirement will increase from 20 to 25 years for men and from 25 to 28 years for women. On average, men are expected to spend more than a third of their lives in retirement, while this figure is higher for women, at 38.6 years in 2070. Due to recent reforms, early retirement rates are expected to decrease for men, while the opposite is expected for women because of the increase in the retirement age.

The role of migration

The scenarios presented above are based on the main demographic forecast for Austria, which includes a long-term positive net migration. In the main scenario, net migration is assumed to be about 35,000 per year (until 2060), which includes about 150,000 persons immigrating to Austria per year and about 120,000 persons emigrating from Austria. Moreover, the migrant population is characterized by a slightly higher fertility rate, which further improves the demographic forecast. It is instructive to show the role of international migration for the demographic forecast by comparing the main scenario with a scenario without international migration (Figure 11). The number of persons aged 65 and over is relatively similar in both scenarios until 2060 (after which the migrant population would also begin to retire). The main source of difference is therefore the population aged 20-64, which remains at around 5.2 million in 2060 in the main scenario but falls to 3.7 million in the no-migration scenario. The cumulative difference of 1.5 million persons is thus due solely to the positive migration balance. This leads to a large difference in the old-age dependency ratio in 2060 with and without migration (Figure 12), which increases to 54 in the main scenario (1.83 working population per population 65+) and to 76 in the no-migration scenario (1.31 working population per population 65+). Considering the fact that the retired population remains relatively constant in each scenario (due to the lower average age of migrants) and ignoring the differences in fertility rates between the scenarios, it is possible to calculate the

annual net migration that would be necessary to keep the old-age dependency ratio at its 2022 level (32). Under these simplifying assumptions, it can be estimated that about 130,000 net migrants per year would be needed until 2060 to keep the old-age dependency ratio constant. At the end of the projection period, if the number of persons aged 65 and over remains constant, the population aged 20-64 would be 8.9 million, of which 5.2 million would be immigrants from 2022 to 2060.

Figure 11: Austria: demographic forecast with and without migration (2022-2060)

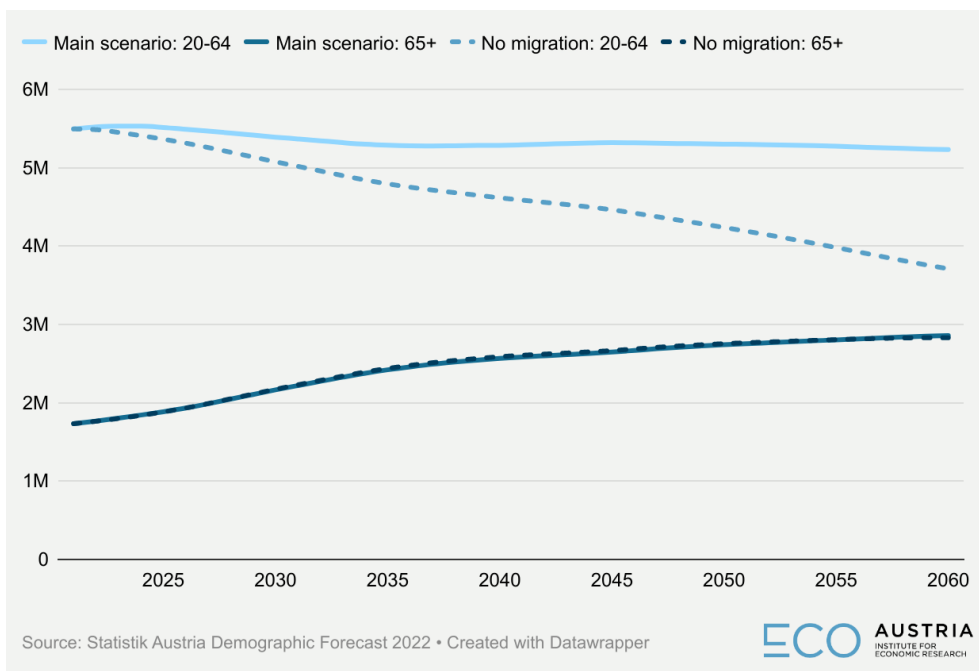
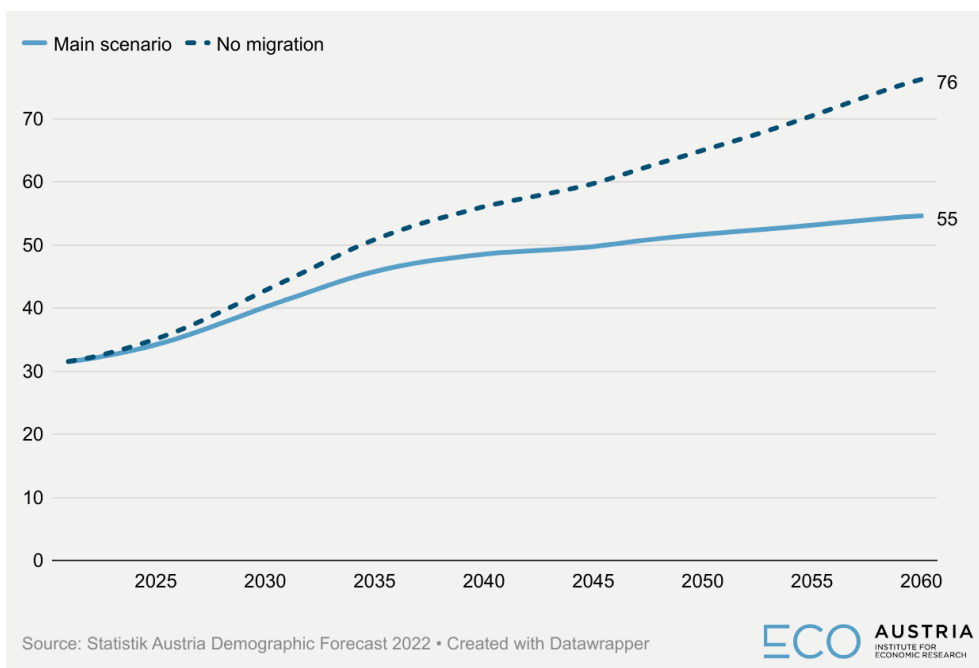


Figure 12: Austria: old-age dependency ratio (65+/20-64) in the main scenario and without migration



2.3.2. General architecture of the pension system

Qualifying conditions

A person is entitled to a pension if contributions were paid for at least 180 months. (There are exceptions for disabled persons and persons who had a work accident.) From these 180 months, 84 months must come from employment (or contribution periods of similar quality). The remaining 96 months can come from other contribution periods, such as unemployment, sick-leave, military service, or child-rearing periods (OECD, 2022).

Current and future retirement age

The statutory retirement age is 65 years for men and all civil servants (also females) and 60 years for women, respectively. The female retirement age will be gradually raised to 65 years in the period from 2024 to 2033 (by ½ years steps). For retirement between the ages of 65 and 68 for men and between 60 and 63 for women the pension is increased by 4.2% per year. Workers who defer their pension also continue to pay contributions thereby increasing their pension entitlements. There are several possibilities for early retirement:

1. Long-term insurance contributions (*“Langzeitversichertenpension - Hacklerregelung”*), currently 44 (women)/45 (men) contributory years or more are required. The early retirement age is 62 years for men and 59 years for women, increasing stepwise to 62 years (4.2% deduction per year before the statutory retirement age).
2. Physically hard work (*Schwerarbeitspension*), a contribution period of 45 insurance years or more is required. Additionally, within the last 20 years before the application there have to be at least 10 years of physically hard work. The earliest possible retirement age is 60 years. There is a deduction of 1.8% per year before the statutory retirement age. For women this scheme will only be relevant from 2024 onwards.⁴
3. Corridor-pension (*“Korridorpension”*), at the age of 62 years, when having at least 40 insurance years (5.1% deduction per year, maximum 15.3% for 3 years before the statutory retirement age). For women this scheme will only be relevant from 2028 onwards.

First-tier pensions

Minimum pensions: pensioners with a low earnings-related benefit receive a means-tested supplement if the sum of the gross pension and income from other sources (some exceptions apply) is less than EUR 966.65 per month for a single person (EUR 1 472.00 for couples). The retiree will receive a compensatory transfer so that the retiree's total income is equal to the threshold. In 2020, an additional form of means-tested supplement was introduced. Pensioners (single households only) with at least 360 contribution months (30 years) will receive a minimum of EUR 1,080. Pensioners in single households with at least 480 contribution months (40 years) received a minimum of 1,315 EUR (1,782 EUR for couples). There are 14 annual payments, and

⁴ For some persons (dependent on their birth date) there is also an option of *“Langzeitversicherungspension mit Schwerarbeit”*.

the adjustment of benefits usually follows the adjustment of earnings-related pensions. The level of the minimum pension was at 28% of the average gross earnings in 2020.

Targeted support: The aim of the means-tested minimum income scheme is to provide a decent standard of living for individuals who are unable to meet their daily living expenses or those of their dependent family members. The assistance scheme is not specifically designed for the elderly. However, older people can only apply if no other resources are available. The monthly threshold in 2020 is EUR 917.35 for singles (EUR 1,376.02 for couples). There are 12 monthly payments. Before applying for a means-tested minimum income scheme, all individual resources must be used up, up to a threshold of EUR 4,586.75 in 2020. It is possible to own a house or an apartment, but the authorities may enter the land register after some time.

The minimum pension is generally indexed annually to consumer price inflation, while the targeted benefit is indexed at the discretion of the government. The level of targeted support was at 22.6% of average gross earnings in 2020.

Second-tier PAYG pensions

The second tier of the PAYG pension system is a defined benefit system. This pillar is mainly financed by compulsory contributions (up to a maximum contribution base). Current contribution rates are uniformly set at 22.8% of gross earnings. The nominal accrual rate in the pension system is 1.78%, which is the fifth highest among OECD countries with defined benefit systems. The calculation is based on lifetime earnings. Pensions are uprated with price inflation and indexed at a discretionary rate that typically exceeds price inflation. Pensionable earnings are capped at 1.55 times the average wage. Given these features, the effective accrual rate is 1.72%, which is currently the second highest in the OECD, just behind Colombia's 1.87%.

2.3.3. PAYG and fiscal challenges

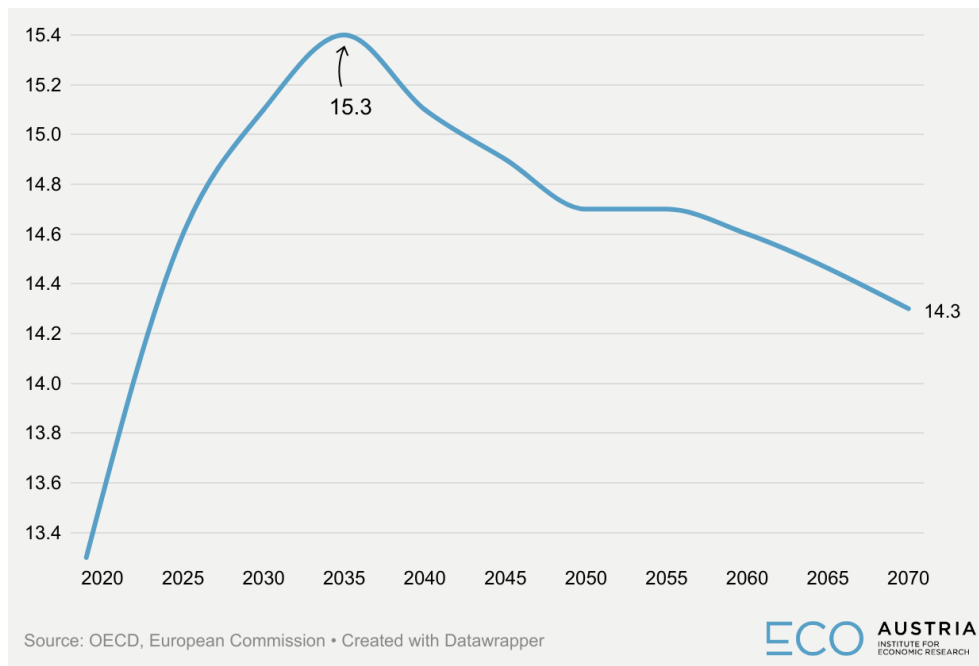
Public Expenditure

Public spending on pensions has increased steadily in recent years and currently stands at around 13.4% of GDP. Since 2010, it has increased by more than one percentage point. According to comparable data from 2021 or the latest available, Austria's expenditure was the fourth highest among OECD countries, with only France, Greece and Italy having higher levels in relation to GDP. Private spending on pensions is comparatively low, amounting to 0.7% of GDP in 2017. The old-age poverty rate, defined as the percentage of the population with an income below 50% of the median equivalized household disposable income, is 10%, which is low compared to other OECD countries, but slightly higher than the poverty rate of the total population, at 9.4% in 2018. For older women in particular, old-age poverty is significantly higher than the overall poverty rate at 12.1%, which is related to the high level of part-time work among women in Austria. The comparatively low old-age poverty is the result of higher replacement rates than in other countries (which, however, will decrease until 2070, as explained in the next section). The (gross) replacement rate for a person earning the average wage is 74.1%, while it drops to 57.3% for a person earning twice the average wage. The OECD averages are 51.8 and 44.4 respectively (OECD, 2021). By comparison, the Austrian system is very generous. Lifetime accumulated

pension wealth is higher than in most OECD countries, ranging from 13.7 times average male earnings for low earners to 10.6 times for high earners, and from 15 times for low and average female earnings to 11.6 times for high earners. The OECD averages are between 11.8 and 8 for men and 13 and 8.8 for women.

Forecast of the public expenditure

Figure 13: Austria: Forecast of public expenditure on pensions (in % of GDP)



Public spending on pensions is projected to increase from 13.3% currently to 15.3% in 2035 and then to decline to 14.3% (Figure 13). The dynamics of pension expenditure can be broken down into the dependency ratio, the coverage ratio, the benefit ratio and the labor market effect.

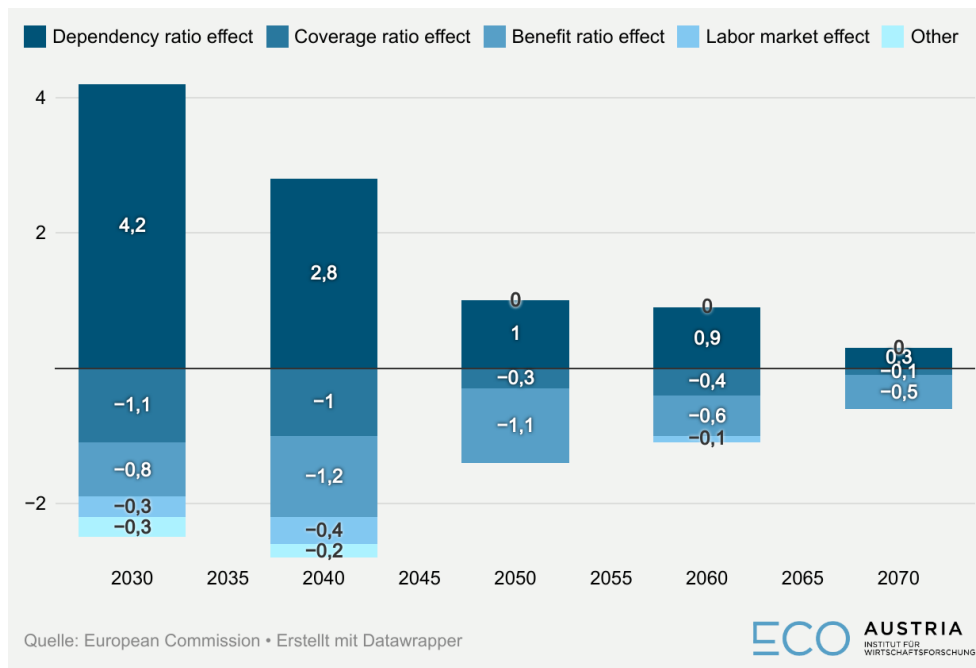
The **dependency ratio** effect reflects the evolution of the ratio of the elderly (population 65+) to the working-age population (population 20-64). While this ratio is 30.7% in 2019, it is projected to rise to 55.9% in 2070. In the absence of other effects offsetting these adverse dynamics, ageing alone would increase public pension expenditure by 9.3 percentage points of GDP in 2070 compared with 2019.

The reduction of the **coverage ratio** goes back predominantly to the enacted legal changes assuming a marked increase in the female exit age from the labor market in the coming decades. After some reforms in the following years, the harmonization of the statutory retirement age for women from 60 to 65 between 2024 and 2033 is expected to have the largest impact on the exit age. The decline in the number of old-age pensions is also linked to the reduction in the number of survivors' pensions.

The **replacement rate** declines from 55.4% in 2019 to 52.1% in 2070. The **benefit ratio** declines throughout the projection period from an initial 53.6% to 42.5% in 2070, mainly because of past pension reforms, notably the introduction of the pension account system. While the reforms

somehow reduce the fiscal pressure stemming from ageing, they do raise the question of increasing old-age poverty.

Figure 14: Austria: Components of change in the public expenditure



The changes due to the four effects are presented in Figure 14. Overall, until 2070 an increase due to increasing dependency ratios of 9.3 percentage points is dampened by 2.9 percentage points with the decreasing coverage ratios, by 0.7 percentage points due to effects on the labor market and by a substantial 4.2 percentage points due to the reduction in the benefit ratios.

Forecast of the replacement rates

Table 3: Austria: Benefit ratios and replacement rates until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Overall benefit ratio	54%	53%	49%	46%	44%	42%	-11.1
Earnings-related benefit ratio	54%	54%	51%	48%	46%	45%	-9.2
Earnings-related replacement rate	55%	56%	55%	55%	54%	52%	-3.3

Source: European Commission • Created with Datawrapper

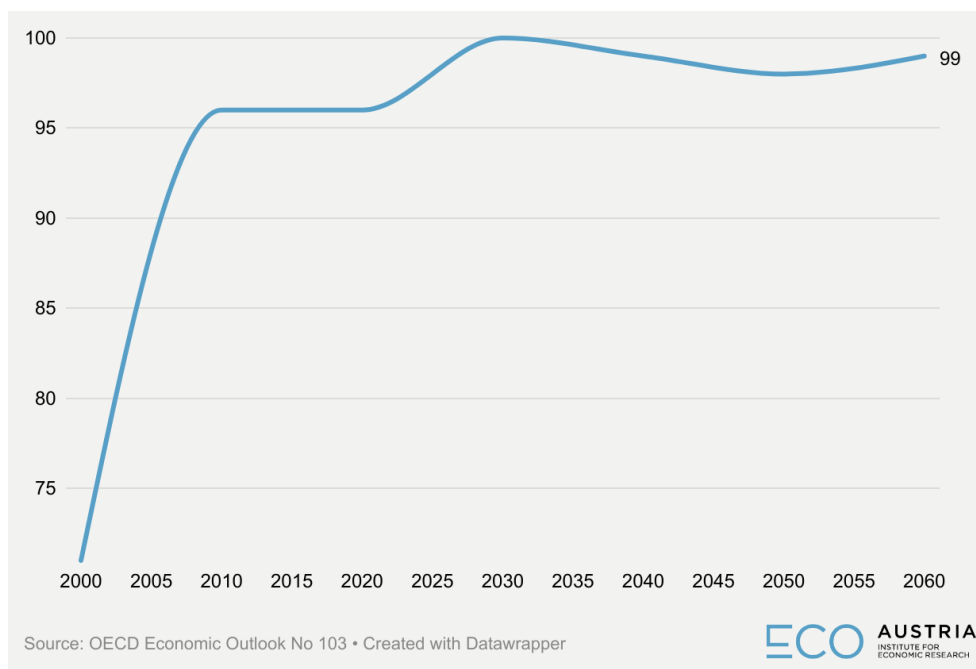
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Benefit ratios and replacement rates are shown in Table 3. The total benefit ratio, i.e., including earnings-related and minimum benefits, is reduced by more than 11 percentage points in 2070. The earnings-related benefit ratio falls by about 9 percentage points and the replacement rate by more than 3 percentage points. These figures imply that without private savings, the income level of the elderly will be significantly reduced in the coming years.

Forecast of the debt levels

An increasing pressure on the public finances in Austria, stemming from an increase in old-age-related expenditure reduces fiscal sustainability. According to the OECD long-term projections, gross financial liabilities as percentage of GDP will rise above 100 % around 2030 and stay at this level until the end of the projection period in 2060 (see Figure 15).

Figure 15: Austria: Projection of long-term gross financial liabilities (in % of GDP)



The assessment of long-term fiscal sustainability can be based on two complementary fiscal gap indicators that show the upfront fiscal adjustment required to achieve two specific long-term fiscal goals (see, DG-ECFIN, 2023):

- the S2 indicator measures the fiscal effort required to stabilize government debt in the long term,
- the S1 indicator measures the fiscal effort required to bring the government debt-to-GDP ratio to 60% by 2070.

The S2 indicator measures the permanent adjustment in the structural primary balance (SPB) in 2024 that would be required to stabilize government debt in the long term. It consists of two components, namely (i) the "initial budgetary position", which measures the gap between the initial SPB and the debt-stabilizing structural primary balance, and (ii) future ageing costs. Austria is assessed to be at medium risk, with an S2 indicator of 3.2% of GDP, of which 2.4 percentage points are due to ageing costs. The main risk stems from the long-term costs of health care and long-term care. The structural primary balance required to achieve fiscal consolidation is 2.6% of GDP, compared to -0.6 projected for 2024, and the European Commission assesses the plausibility of achieving this target (based on past projections) as zero.

The S1 indicator measures the permanent fiscal effort needed in 2024 to bring the debt ratio down to 60% of GDP by 2070. The S1 indicator consists of three components, namely (i) the "initial budgetary position", which measures the gap between the 2024 SPB and the debt-stabilizing structural primary balance, (ii) the debt requirement, which is related to the distance of the current debt ratio from the 60% reference value, and (iii) future ageing costs (DG-ECFIN, 2023). Austria's S1 indicator is 2.4%, indicating a medium fiscal risk, mainly driven by ageing costs, with pensions accounting for 0.3 percentage points, health care for 0.7 percentage points and long-term care for 1 percentage point. The implied structural balance in 2024 is 1.8, compared to a projected -0.6% of GDP.

2.3.4. Funded Pensions (Second and third tier)

Voluntary/Mandatory, Occupational/Personal, Book reserves

The Austrian Occupational Pension Act ("*Betriebspensionsgesetz*") contains regulations for occupational old-age provisions in the second pillar. This Act regulates primarily following firm-related retirement provisions:

- Pension provision funds ("*Pensionskassen*")
- Occupational collective insurances ("*Betriebliche Kollektivversicherung*")
- Direct provisions allowed by a company to an employer ("*Direkte Leistungszusage*")
- Life insurances

By the end of 2021, the assets of pension funds have increased to EUR 27 billion (6.7% of GDP), and the assets of collective occupational insurance schemes (established in 2005) will be around EUR 1.0 billion (0.3% of GDP). Since 2002, employers have been required to pay 1.53% of their employees' monthly salaries into a pension fund set up specifically for the new severance pay system. In the event of termination of employment by the employer and after a minimum period of service of 36 months, the employee is entitled to receive a severance payment or to leave the amount in the employee provident fund. For retirement purposes, retired employees can choose to receive the payout in the form of a lump sum (taxed at 6%) or as an additional monthly pension (tax-free). A recent industry report by the Financial Market Authority (FMA) on Austria's eight occupational pension funds shows that the pension assets they manage will total EUR 16.6 billion at the end of 2022.

Other elements of the funded second tier, besides the severance pay, are voluntary. Occupational pension provision in Austria is regulated on a voluntary basis and is dependent on the employer. In addition to direct benefit commitments, the employer can - depending on the model - pay approximately 10.25% of an employee's gross salary into a private pension fund. These payments can be claimed as business expenses and are therefore tax-free. The pension fund subsequently assesses these contributions, and the funds are exempt from both capital gains tax and corporate income tax. The employees' own additional contributions are tax privileged. In addition, a state premium is added for up to 1,000 euros per year.

Respectively, the coverage of the voluntary occupational tier is comparatively low. While in countries with mandatory or quasi-mandatory occupational systems (e.g., through incentives or opt-outs) systems like Denmark or the Netherlands coverage rates are close to 100% of the working-age population, the coverage in the voluntary occupational system in Austria (“*Pensionskassen*”) is currently⁵ at 15.2% of working-age population. The coverage has increased slightly by 0.5 percentage points since 2001. Out of about 25 billion EUR under management of the *Pensionskassen*, about 80% of assets are allocated in defined-contribution schemes while the rest is allocated in defined-benefit schemes (see OeNB, 2023).⁶

The third tier of the Austrian pension system consists of private pension provision by individuals. As with occupational schemes, individuals can choose from a variety of investment products that directly or indirectly serve the purpose of retirement provision. Thus, in the private individual system, a distinction can generally be made between particular pension-oriented provisions and a general accumulation of savings over the life cycle. Traditionally, life insurance has played an important role in long-term savings. Private life insurance contracts have continued to show a strong upward trend in recent years. While private life insurance generally results in a single payment, private annuity contracts are usually taken out for the purpose of receiving a lifelong pension (BMF, 2021). The most popular form of private old-age provision is the so-called “*Zukunftsvorsorge*”. It was introduced in 2003 as a form of life insurance (including a capital guarantee) subsidized by the state with a tax premium. After a minimum investment period of 10 years, the taxpayer can dispose of these rights. However, if the rights are paid out, half of the allowed government bonus must be repaid, along with a 25% retroactive tax on the capital gain, and the capital guarantee is lost. If the rights are transferred or used for pension payments, no tax is due. Coverage is comparatively low at 16.5% of the working-age population (OECD, 2022) and has even declined in recent years (by 1.2 percentage points since 2011) due to low capital gains in the face of low interest rates and the reduction of the government subsidy in 2012.

Investment regulations

Both second- and third-tier plans are subject to a statutory “capital guarantee”. Occupational pension plans must provide a guarantee for the invested funds unless the provision of this minimum return guarantee is excluded. In principle, the pension fund is obliged to provide the minimum return guarantee for the invested funds. However, this minimum return guarantee can be excluded in the contract between the pension fund and the employer. In such cases, a pension fund commitment exists without a minimum return guarantee. This requires a waiver of the minimum return guarantee in an agreement between the employer and the employees (company agreement, collective agreement). Employee involvement is not required if the pension fund model is based on a defined benefit plan, because in a defined benefit plan the employer bears the investment risk and the contributions paid by the employer are adjusted depending on the investment performance. The minimum return guarantee is based on half of the average monthly circulation-weighted average yield on bonds (a weighted average of the yields on federal bonds listed on the Vienna Stock Exchange) over the last five years minus 0.75 percentage points (see

⁵ Latest data from 2021.

⁶ <https://www.oenb.at/isaweb/report.do?lang=DE&report=3.16>

FMA, 2023). There are no strict rules regarding investment strategies, except for the explicit mention of the "prudent person rule" in the law. According to this rule, pension funds may only invest in assets and instruments whose risks they can adequately identify, measure, monitor, manage and report. All assets must be invested in such a way as to ensure the safety, quality, liquidity and profitability of the overall portfolio. However, the yield guarantee results in conservative investment strategies. For example, as of the first quarter of 2023, of the EUR 25 billion under management in the occupational second tier, EUR 5.3 billion was invested in equity funds, EUR 6.7 billion in bond funds, EUR 8.9 billion in balanced funds and EUR 1.4 billion in real estate funds (OeNB, 2023).

The third tier (*Zukunftsvorsorge*) is subject to strict investment rules regarding the proportion of invested capital in different assets. In addition, the pension fund must provide a 100% capital guarantee on the amounts paid in and on the state contributions, except in the case of a cash payment. Regarding investment strategies, as of 2010, at least 30% of the capital must be invested in shares that are listed for the first time on a stock exchange in a member state of the European Union or the EEA. For policies taken out between January 1, 2010, and July 31, 2013, the equity quota depends on the taxpayer's age (life-cycle model): 30% up to the age of 45; 25% from 45 to 55; 15% from 55. Existing contracts may be converted to the life-cycle model. The stock market capitalization of the relevant EU or EEA country in whose shares are invested may not exceed 40% of GDP over a period of several years. As of August 1, 2013, the life-cycle model for new contracts has been changed to a two-tier model with a range within which the equity allocation must lie: up to the age of 50, 15% to 60%; from the age of 50, 5% to 50%. Initially, only 60% of the shares must be listed on certain stock exchanges in the EU or EEA (see above). Existing contracts may be converted to the new model under certain conditions.⁷

Assets allocated

In international comparison, there is comparatively little capital allocated in funded pensions in Austria, with currently about 6.7% of GDP under management in pension savings. The OECD average is significantly higher at 99.9%, meaning that the sum of assets in pension plans in the OECD countries roughly equals the GDP of all OECD countries combined. Internationally comparable data is only available for the "*Pensionskassen*," and shows that in Q1 2023 21.2% was invested in equity, 27% in bonds and cash, 5.2% in real estate and 35.6% in other funds. The "other" category includes loans, land and buildings, unallocated insurance contracts, hedge funds, private equity funds, and other structured products. Regarding home bias, as of end of 2021, 96.1% of assets of funded schemes were allocated abroad (Fenzal, 2021).

Investment performance

In 2021, Austria's funded and private pension plans performed around the OECD average with a real return of 3%, while rates ranged from 15.5% in Poland to -9.7% in Turkey. Over the long term, Austrian pension plans performed poorly, with a geometric average of 1.8% in real terms over the last five and ten years, and 1% over the last 15 years. By comparison, real returns in the Netherlands and Denmark averaged more than 4% over the past 15 years (OECD, 2021).

⁷ https://www.wko.at/service/steuern/Die_praemienbeguenstigte_Zukunftsvorsorge.html

According to preliminary data for 2022 (OECD, 2023), Austria's real rate of return was negative at -18%, which is around the average for all OECD countries.

The main point of criticism regarding the poor performance of the funds is the "capital yield guarantee", which is mandatory for both second- and third-tier products (see previous section). The yield guarantee results in funds investing in riskless assets, which tend to underperform in the long run.

Tax treatment

As mentioned above, the pension fund's funds (second tier) are exempt from both capital gains tax and corporate income tax. The employees' own additional contributions are tax privileged. In addition, a state premium is added for up to 1,000 euros per year. Investment income is tax-exempt for pension companies, occupational group insurance, direct insurance, support funds and personal pensions (i.e., for all collective and personal plans). Investment income is considered a company profit and subject to profit tax for direct commitments. Tax treatment of the income depends on the type of the plan: Pension companies and occupational group insurance: Pensions are taxed as earned income at the individual's marginal rate of income tax. The portion of pension accrued by employer contributions is fully taxed. Only 25% of the portion of pension accrued by employee contributions is taxed; Personal pension insurance: Pensions are taxed as earned income at the individual's marginal rate of income tax from the moment the total value of benefits paid exceeds the capital value of the pension at retirement. It means that pension benefits are tax-free until that point in time; State-sponsored retirement provision (*Zukunftsvorsorge*): Withdrawals are tax-exempt after having reached a certain age and a certain length of investment if the entitlements are transferred to an occupational or personal pension plan or used to buy an annuity. If they are paid out as a lump sum, the individual must pay back 50% of the government subsidies and a 27.5% tax on capital gains. This roughly corresponds to a TET/TEE/TE(PE) regime in the second tier and a TEE regime in third tier.

2.3.5. Highlights and main features of the system

1. Strengths and weaknesses (according to Overall Pension Index – OPI)
<ul style="list-style-type: none"> - The Austrian pension system shows good results with regard to “Adequacy” (with an OPI score of 0.66 and ranked 4th among 11 countries) and “Equitability” (OPI score 0.68, ranked 1st). - The overall pension system shows, however, medium to low results in terms of “Sustainability” (OPI score 0.37, ranked 9th) and “Market capitalization” (OPI score 0.39, ranked 6th).
2. Tax treatment
<ul style="list-style-type: none"> - 2nd tier employer financed occupational plans: EET; 3rd tier state-sponsored retirement provision: TEE; 3rd tier personal plans: TET.
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - Participation is not legally binding. However, participation is anchored in collective agreements or company-level agreements. Contributions are paid by employer according to agreed conditions. - The employer can pay up to 10.25% of an employee's gross salary into a private pension fund. These payments can be claimed as business expenses and are therefore tax-free.
4. Asset Allocation
<ul style="list-style-type: none"> - In the year 2022 according to OECD: Equities (33.0%), Bills & Bonds (27.2%), Cash & Deposits (2.0%), Other* (37.8%) <p><small>* Assets invested in loans, real estate (land and buildings), unallocated insurance contracts, private investment funds and other alternative investments.</small></p>
5. Obligatory character
<ul style="list-style-type: none"> - Occupational schemes are subject to auto-enrolment from 2012. Individual pension plans are voluntary.
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - Occupational funded pensions in the form of "betriebliche Altersvorsorge" are paid out in the form of a continuous annuity pension. A one-off payment is only possible under certain conditions and only up to an upper limit ("Abfindungsgrenze" of currently EUR 15,600).
7. Contributions to funded plans as percentage of GDP
<ul style="list-style-type: none"> - According to OECD Pension Markets in Focus 2022 (OECD 2023) the volume of contributions to all forms of funded schemes was only 0.3% of GDP in 2021.
8. Investment performance
<ul style="list-style-type: none"> - According to time-series data in OECD Pension Markets in Focus 2022 (OECD 2023) the average investment rate of return from 2011 to 2021 was 2.0%. - At the same time the OECD average was 3.7%.

Additional information and results

- High and increasing public costs for the pension system. There is a need to subsidize assets from the general budget, especially for women.

- Recent reforms have reduced costs somewhat, but at the cost of low long-term benefit ratios.
- Assets in funded second and third tier pension plans are very low by international standards-only about 6.7% of GDP is allocated to funded schemes.
- Funded schemes have performed poorly in recent years, probably because the "capital guarantee" forces providers to invest in very low-risk assets.

2.4. Czech Republic

2.4.1. Demographic profile and forecast

From today's viewpoint, the population of the Czech Republic will decrease slightly over the next 50 years. In the year 2019, Czech Republic had 10.67 million inhabitants whereas population size is projected to be about 10.2 million persons by the year 2070. While the population growth rate is positive in the year 2019 (see Table 4), it is predicted to turn negative in the subsequent decades. Notably the shrinking of the population size takes place despite a positive net migration.

Similarly to other countries in the European Union, the old-age dependency ratios of the Czech Republic will increase dramatically in the foreseeable future. The ratio of those aged 65 and above to those who are between 64 and 20 years old is projected to reach 53.7% in the year 2070, compared to approximately 33% today. The change in population structure can also be broken down as follows: From 2050 onwards, the part of the population in retirement (aged 65 and older) will comprise more than half of the working age population (aged between 64 and 20 years).

This circumstance can be attributed to two factors. On the one hand, the elderly population in the Czech Republic, people aged 65 and older, is expected to increase by over 50% between 2019 and 2060. This trend is due to the fact that, for men and women alike, life expectancy increases considerably within the projection period.

Whereas a man born in the Czech Republic in 2019 has on average a life span of 76.5 years, a male newborn in 2070 is already projected to live 8.3 years longer, until the age of 84.8. For a woman on the other hand, life expectancy at birth grows from 82.2 years in 2019 to presumably 89.2 years in 2070.

Apparently, the gain in life span is smaller for women than for men, as male life expectancy is projected to catch up with its female counterpart. Thus, the increase in population aged 65 and older until 2060 will be higher for men – about 65% – than for women – about 40%.

On the other hand, the population aged between 19 and 64 years is expected to decline in the Czech Republic by 18% between 2019 and 2060. Both factors contribute to the evolution of the old-age dependency ratio, which poses challenges to the pension system as will be explained later on.

Table 4: Czech Republic: Demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	10,672	10,756	10,619	10,526	10,405	10,204	10,672 → 10,204
Population growth rate	0.4	-0.1	-0.1	-0.1	-0.2	-0.2	0.4 → -0.2
Old-age dependency ratio (pop 65+ / pop 20-64)	33.0	38.6	45.2	54.8	59.2	53.7	33 → 53.7
Old-age dependency ratio (pop 75+ / pop 20-74)	10.9	16.9	18.5	22.6	28.3	29.0	10.9 → 29
Ageing of the aged (pop 80+ / pop 65+)	20.7	29.6	31.8	30.7	40.1	45.0	20.7 → 45
Men - Life expectancy at birth	76.5	78.4	80.2	81.8	83.4	84.8	76.5 → 84.8
Women - Life expectancy at birth	82.3	83.9	85.4	86.7	88.0	89.2	82.3 → 89.2
Men - Life expectancy at 65	16.5	17.8	19.1	20.3	21.4	22.5	16.5 → 22.5
Women - Life expectancy at 65	20.0	21.3	22.5	23.6	24.7	25.7	20 → 25.7
Men - Survivor rate at 65+	83.3	86.2	88.4	90.3	91.8	93.1	83.3 → 93.1
Women - Survivor rate at 65+	91.9	93.2	94.2	95.1	95.8	96.4	91.9 → 96.4
Men - Survivor rate at 80+	49.0	56.1	62.0	67.4	72.1	76.2	49 → 76.2
Women - Survivor rate 80+	69.7	74.6	78.5	81.9	84.8	87.2	69.7 → 87.2
Net migration (thousand)	44.2	16.3	16.6	17.5	18.0	18.2	44.2 → 18.2

Source: European Commission • Created with Datawrapper

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The indicator “Ageing of the Aged”, which denotes the ratio of persons of age 85 and older to the persons of age 65 and older, is expected to more than double between the years 2019 and 2070. Amounting to 20.7% in the year 2019, it is expected to add to 45% only 50 years later. This projection is in line with the assumption that the probability of reaching the age of 80 rises sharply within the next decades.

In 2019, the probability for men to survive until 80 was barely 50%, for women considerably higher, approximately 70%. However, male residents of the Czech Republic will enjoy a survival rate of 76.25% fifty years later, still exceeded by women who, in 2070, display a 87.2% probability to hit the age of 80.

The average labour market exit age for men is anticipated to increase from 63.5 to 64.2 years by the year 2030, as can be seen from Table 5. Similarly, for women, the average exit age will be 63.4 years, compared to the previous 61.4 years. These increases in retirement age are expected to remain constant over the foreseeable future. Thus, the average retirement age for men and women will not fully compensate for the simultaneous increase in life expectancy. Consequently, the average length of retirement for men is projected to extend by 5.4 years, and for women by 4.1 years from 2020 to 2070. The percentage of adult years spent in retirement too, will rise because of this fact, namely to 33.5% for men and 37.8 % for women by the year 2070. (EU, 2021b)

Table 5: Czech Republic: Exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labour market exit age (CSM) - Men	63.5	64.2	64.2	64.2	64.2	64.2	
Duration of retirement - Men	17.9	18.5	19.8	21.0	22.2	23.3	
Percentage of adult life spent in retirement - Men	28.2	28.6	30.0	31.3	32.5	33.5	
Early/late exit - Men	1.1	1.5	1.4	1.2	1.1	1.1	
Average labour market exit age (CSM) - Women	61.4	63.4	63.4	63.4	63.4	63.4	
Duration of retirement - Women	23.5	23.1	24.3	25.5	26.6	27.6	
Percentage of adult life spent in retirement - Women	35.1	33.7	34.8	35.9	36.9	37.8	
Early/late exit - Women	1.5	1.9	1.7	1.4	1.2	1.2	

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

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The role of migration

Following the data issued by the European commission, visualized in Table 4, net migration in the Czech Republic will decline from 44.2 thousand persons in the year 2019 to 18.2 thousand persons in 2070. Nevertheless, Eurostat's latest population projection suggests that migration will positively affect the Czech workforce in the foreseeable future.

Figure 16 indicates that by the year 2060 there would be approximately 730 000 less persons aged 20 to 64 if there were no migration in the Czech Republic. Naturally the population projection should not be considered a forecast as it merely analyses the implications of a set of assumptions concerning fertility, mortality, and net migration which are held constant over the time horizon in question. However, the result highlights the positive and impactful effect of migration on labour supply in the Czech Republic.

The number of persons aged 65 and older will hardly be affected by migration over the next decades, according to Figure 16. The figure also illustrates the significant increase in the number of pensioners during this time period.

Migration also contributes to lowering the old-age dependency ratio in the Czech Republic. Figure 17 illustrates that according to the calculations by Eurostat, the ratio would amount to 64 in the scenario without migration as opposed to 56% in the main scenario by the year 2060.

Figure 16: Czech Republic: demographic forecast with and without migration (2022-2060)

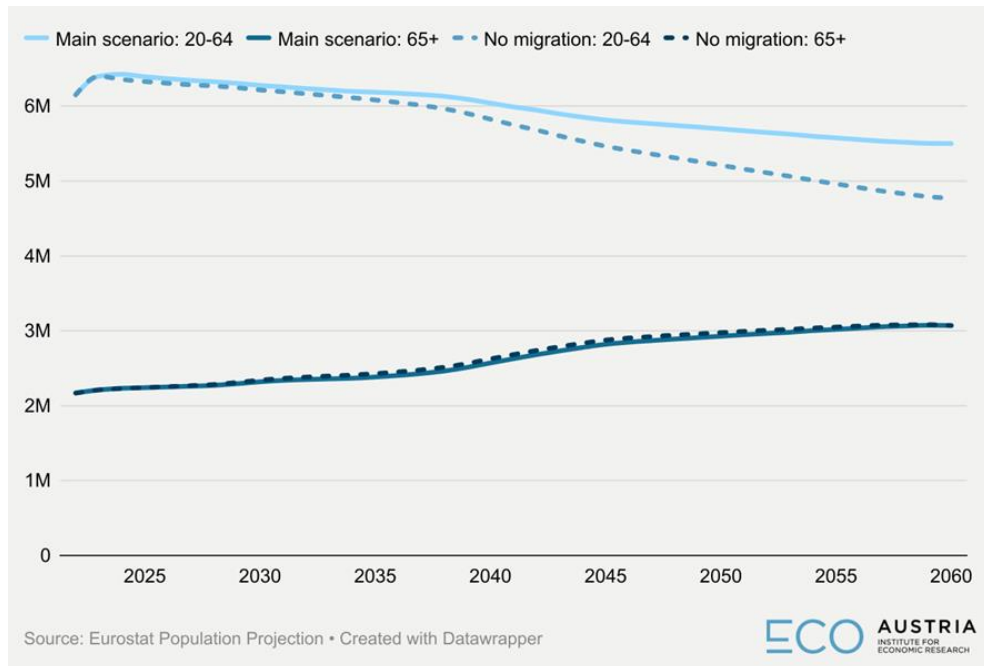
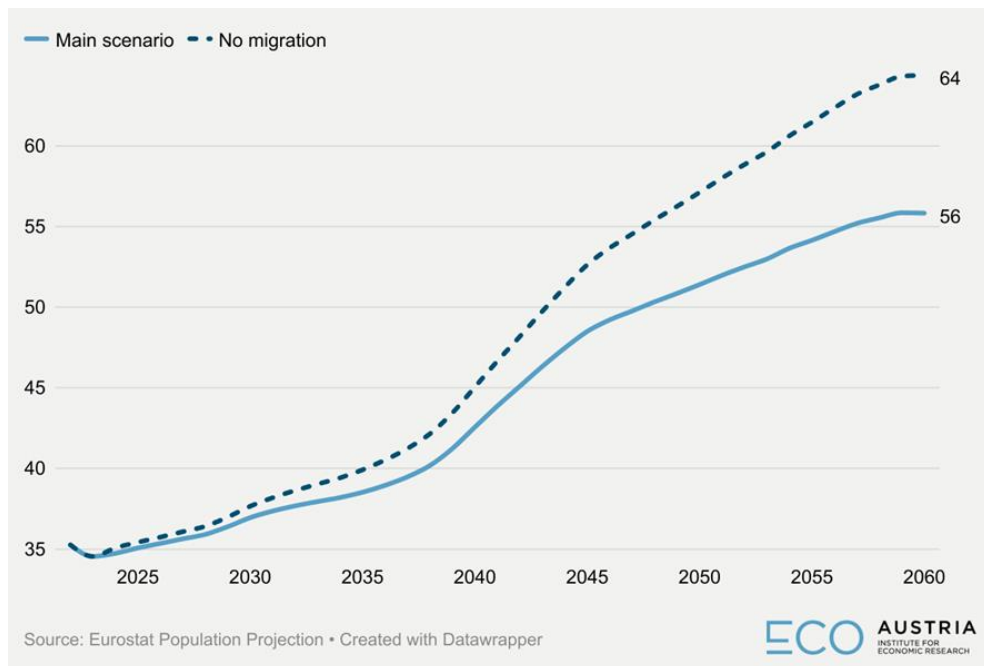


Figure 17: Czech Republic: old-age dependency ratio (65+/20-64) in the main scenario and without migration



2.4.2. General architecture

The Czech pension system is still strongly influenced by the socialist model of former Czechoslovakia. It mainly consists of a public PAYG component and a voluntary supplementary funded component for topping up. The public statutory scheme (“Důchodové pojištění”) provides both 1st tier and 2nd tier pensions. The public pension system guarantees a minimum statutory

pension level (**1st tier**) to those individuals who qualify for any pension in the statutory old age pension scheme. Outside of the pension system, persons with insufficient financial means are protected by the assistance in material need. This general social assistance measure is means-tested and supports those who have insufficient income.

Mandatory insurance in the statutory old age pension scheme constitutes the standard protection in old age in the Czech Republic. The public statutory PAYG pension scheme fulfils the function of **2nd tier** pensions in providing for earnings-related benefits. The benefit calculation is primarily based on the length of insurance period and the amount of contributory earnings throughout working career.

Voluntary participation in supplementary private pension schemes provides options for ‘topping up’ public pensions (**3rd tier**). The Czech pension system does not feature funded 2nd tier components. Accordingly, the Czech pension system can be structured in the following overview:

- The **first and second tier** is defined by the “statutory old age pension scheme” (Důchodové pojištění), which is an earnings-related PAYG system with mandatory insurance for almost all economically individuals. This component represents the standard protection and the main source of income for pensioners. It also provides for a guaranteed minimum pension for those, who are insured in the system.
- The Czech pension system does not include a separate **second tier** scheme. Income-related benefits are granted within the framework of statutory pension insurance. The public statutory pension system therefore has a double function and offers elements for the first and second tier.
- Additionally, there is the “supplementary pension savings scheme” (Doplňkové penzijní spoření), which acts as a private voluntary top-up (**third tier**). This component is fully funded and contributions are incentivized.

Qualifying conditions

The minimum years of required coverage (work and non-work validated periods) to be eligible to an old-age pension at retirement age is 35 years, or 30 years without non-work validated periods. Individuals with 20 years of pension coverage or 15 years without non-work validated periods can receive a pension benefit five years later than the normal retirement age that applies to men of the same birth year. Anyone reaching 35 years of coverage within these five years can retire. However, only a few hundred new pensions are currently claimed five years after the retirement age. Voluntary contributions can be made to make up for missing years of coverage if participants fall short of the required coverage.

In comparison to other OECD countries, the Czech Republic is an outlier with the longest period to be eligible for earnings-related pensions at the statutory retirement age. Mexico comes second with “only” 24 years required. On average among OECD countries, this period amounts to to nine years. In many countries, it is less than one year.

Currently the majority of people around the retirement age reach the minimum years of coverage. The inclusion of some non-employment spells in the covered period is one of the reasons why so

far only few people have not reached the minimum requirements to receive a pension. The average number of years of coverage for those who claimed a pension in 2018 from the normal retirement age equals 46 years for men and 43 years for women. Only a minimal share does not reach 35 years, even among women. (OECD, 2020)

Retirement age

In 2020, the standard retirement age in the Czech Republic was 63.5 years for men and 63 years and two months for women without children. According to the OECD definition, used for comparison purposes, the standard retirement age is the age at which individuals are eligible for retirement benefits from all pension components without penalties, assuming a full career from the age of 22.

It is gradually increasing by two months per birth cohort for men until reaching age 65. For women without children, it is currently increasing by six months per birth cohort to equalise with the retirement age for men by the end of 2020. Women who had children can retire earlier. Having one child allows a woman to retire one year earlier, for two children two years earlier, for three or four children three years earlier, and for five or more children four years earlier. The normal retirement age of women with children is also rising by six months per year until catching up with the retirement age for men. The convergence will be completed in 2037. (OECD, 2021e)

First and second tier pensions of the public statutory scheme

The first pillar of social protection for older people in the Czech Republic consists of benefits from the contributory pension scheme and several non-contributory safety-net benefits. Currently, nearly all of the about 2 million people aged 65 or older receive contributory old-age or survivor pensions (or both), which include the basic pension amounting to about 10% of the average wage. In addition, safety-net benefits support 465 000 people aged 65+, some of whom receive several benefits. Among these schemes, health-related benefits are predominant while social assistance plays a minor role. Overall, the effective coverage of older people by the first pillar of social protection in the Czech Republic is universal.

The contributory old-age pension includes two first-tier components: a flat benefit (basic pension, which is independent of earnings), and a minimum amount for the earnings-related benefit (minimum pension). In total, the contributory pension sets a floor on pension income for old-age pensioners – depending on eligibility conditions – independent of their previous earnings levels, equalling about 12% of the average wage, which is roughly half the average value among the 24 OECD countries with such schemes.

In addition, all residents may be eligible to benefits from the safety net, which guarantees a minimum income to all Czech residents in need. The guaranteed income is equal to about 10% of the average wage, slightly below what is offered by the first-tier elements of the contributory pension but only about half the average level in the OECD. The safety net provides care and mobility allowances for people with disabilities, a housing allowance for low earners and social assistance (“assistance in material need”) in case of both low income and low assets.

The guaranteed minimum income, which is the calculation base for the social assistance benefit, is nominally fixed and can only be changed if inflation exceeds 5% or in case of extraordinary

circumstances. As only limited adjustments have been made since the introduction of the scheme in the early 1990s, its value has decreased substantially relative to wages, from more than 30% of the average wage in 1991 to about 10% in 2019. A further fallback of the social assistance relative level would further question whether it can ensure an adequate living minimum when own earnings capacity is limited as in old age.

Today, recipient numbers of non-health related safety-net benefits are low. The reasons for this are complete employment histories in the former Czechoslovakia, record-low income inequality since then, generous validation of non-contributory periods for old-age pensions, especially in the past, and high homeownership rates. The number of pensioners that spent (parts of) their career in former Czechoslovakia will continue to steadily decline while higher reported unemployment, in particular in the 1990s and 2000s, will have more impact on pension benefits. Consequently, a growing share of older people may not reach the high number of minimum contribution years in the Czech contributory scheme in the future and may have to rely on safety nets.

The mandatory Czech pension system consists of an earnings-related component and a basic, flat-rate component. The earnings-related component is calculated by multiplying the reference wage with total accrual. Some non-employment spells count towards accrual while others do not and enter on top as zeros in the calculation of the reference (average) wage. Everyone who is eligible for the earnings-related component receives the basic pension, which is equal to 10% of the average wage.

In the Czech Republic, pension contribution rates are 28%, split between employers (21.5%) and employees (6.5%). These contributions are meant to finance old-age (both earnings-related and basic), survivor, and disability pensions. The contribution rate in the Czech Republic is among the highest in the OECD, along with France, Hungary, Italy, the Netherlands and Poland. At the average wage, the total effective pension contribution rate equalled 18.4% on average in the OECD in 2018. There might be a bias in this comparison as in some countries the contribution rate is earmarked for old-age and survivor pensions. Even taking into account only OECD countries with contribution rates that also finance disability pensions, the Czech contribution rate is 7 percentage points higher than the average.

Pension contribution rates are a part of social security contributions in the Czech Republic. In addition to pension contributions, employees and employers pay 4.5% and 9.0% contributions for health insurance, respectively. Employers pay 2.1% for sickness and 1.2% for unemployment insurance. This leads to a very high total social security contribution rate of almost 45%. In addition, pension contributions are subject to personal income tax in the Czech Republic.

Anyone earning less than CZK 3,000 per month in 2020 (8.5% of the average wage) is not subject to social security contributions and does not accrue pension entitlements. Given that the minimum wage is 40% of the average wage, this means that anyone working more than 21% of the time at the minimum wage or above contributes to the pension system.

Contributions are paid on earnings up to four times the average wage (national definition), which is equal to 3.75 times the average wage based on the OECD harmonised definition; this threshold was introduced in 2008. Earnings above the contribution threshold have been subject to a higher

income tax rate since 2013 such that the total of the tax rate and contribution rate remains constant above the contribution threshold. The degree of progressivity of the tax system is a political choice; however, this specific nexus between contribution rates and tax rates for high earners might blur the boundaries between pension contributions and taxes.

One specificity of the Czech pension system is to accrue entitlements based on the reference wage that is computed for the whole working life, rather than accruing entitlements for each year based on earnings during that period. This makes a big difference because the reference wage is far from being a linear function of (uprated) past wages.

The earnings-related pension gives 1.5% of the reference wage for each full year of service. To calculate the reference wage and therefore pension benefits, a very progressive formula is used under which income thresholds are applied. Up to the threshold of CZK 14,388 in 2019 (44% of the average wage based on the national definition), the wage is fully taken into account. Between this threshold and the pensionable-earnings cap (CZK 130,796 or 400% of the average wage), only 26% of the wage is taken into account. Earnings over the cap are not taken into account, neither for contributions nor for the calculation of benefits. The average of all earned wages since 1986 are taken into account for the reference wage, uprating past wages by the growth of economy-wide average wage. Non-validated periods are included in the reference wage as zeros. Lower accrual rates for higher wages lead to a reduction of the effective accrual rate as wages increase. Up to the first threshold, the effective accrual rate is equal to the statutory accrual of 1.5%, then the effective accrual sharply drops to 0.5% at the pensionable-earnings cap, after which it gradually drops further.

Part-time work is treated in the same way as full-time work: accrual is 1.5% of the reference wage for each year of service. This means that if someone works 2.5 days a week for one year, this is counted as one year of contributions. Of course, the reference wage is lower compared to someone working full time for the same hourly wage. However, given the progressive reference wage formula, the impact on pensions is less than proportional. In extreme cases – i.e., someone working less than 21% of the time at the minimum wage – no contributions are made, and no accrual takes place. (EU, 2021b)

Third tier

The third tier is a voluntary, supplementary, fully funded and state-subsidized pension scheme based on defined contribution (DC). It also includes life insurances as a product of commercial insurance companies. Compared to the first tier and with respect to pension sustainability and adequacy, the third tier plays a rather minor role. (EU, 2021b)

2.4.3. PAYG and fiscal challenges

Public Expenditure

Pension spending in the Czech Republic increased considerably between the years 1994 and 2013 (from 5.5% of GDP to 8.6%) before dropping to about 7.9% in the year 2019, which is slightly above the OECD average. (OECD, 2023)⁸

The containment of public expenditure may be ascribed to several reforms of the pension system, including the increase in statutory retirement age that will stabilize the number of retirees until the year 2030.

The financing of the public pension scheme is wage based. The pension insurance contribution amounts to 28%, whereas employees provide 6.5% and the rest stems from the employers. The fiscal burden supported by workers and the employers' social contributions are among the highest in the OECD, leaving little room to increase pension contributions.

The old-age income poverty rate, measured as the share of people older than 65 with income below half the Czech median income, is relatively low in international comparison, equal to 7.4%. As in most other OECD countries, the risk of relative poverty rises with age among the elderly, from 6.5% for the 66-75-year-olds to 9.2% for those aged 76 and over. Moreover, older women are much more likely to be income-poor than older men (11.0% of women versus 2.7% of men among the 65+) as in nearly all other OECD countries, with the OECD average rates equalling 16.5% and 11.6%, respectively. As in almost all countries, this higher poverty risk of older women compared to older men is largely driven by a larger poverty risk of one-member households that are more common among women than men.

Net pension replacement rates for average wage earners are at 60% in the Czech Republic just above the OECD average. Most OECD countries aim to protect low-income workers (here defined as workers earning half of average worker earnings) from old-age poverty, which results in higher replacement rates for them than for average earners. This is certainly the case for the Czech Republic where net replacement rates for half-average-wage earners are high at 92%. By contrast, higher earners (twice the average wage) have replacement rates well below average-wage earners in the Czech Republic (41% versus 60%). (OECD, 2020)

Forecast of public expenditure

Public pension expenditures as a share of GDP are expected to rise in most OECD countries. According to EU projections, the Czech Republic is among the countries with the highest expected increase.

However, between the years 2020 and 2030 due to the postponements in the retirement age, the expenditures are broadly constant (see Figure 18). After the year 2030, spending in terms of GDP ratios is projected to grow sharply, fuelled by the increase in longevity, a fixed retirement age and a wave of strong population cohorts entering retirement. Thus, pension spending will grow from 8.8% of GDP in 2030 by 3 percentage points to 11.8% until the year 2060.

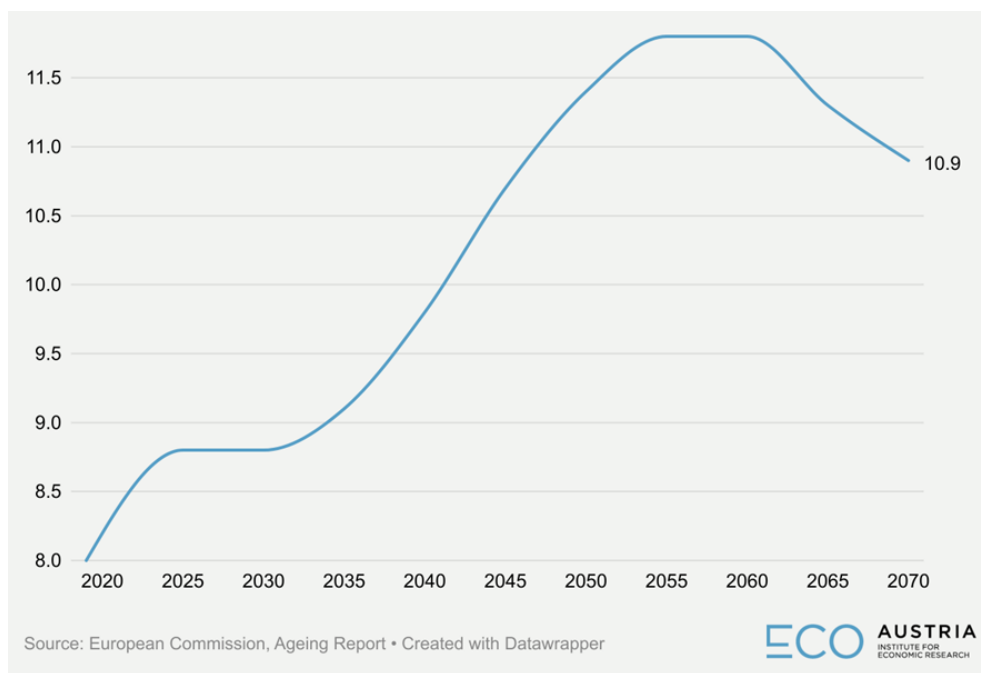
⁸ Data is taken from the OECD data platform at [Weblink](#).

After 2060, pension spending is projected to decrease as big cohorts born in the 1970s leave the pension system and as the average validated contribution period declines.

The old-age dependency effect represents the change in public expenditure that can be ascribed to population ageing and the decline in working population. From Figure 19 it is evident that this effect is the main driver of the increase in public pension spending. However, the old-age dependency effect is partially offset by the coverage ratio effect. This effect captures the consequences of reforms that aim to limit the number of Czech residents who receive old-age pensions.

In the last decade of the projection horizon, the old-age dependency effect is also behind the decrease of pension expenditure as it illustrates the outflow of strong generations from retirement. (EU, 2021)

Figure 18: Czech Republic: Forecast of public expenditure on pensions (in % of GDP)

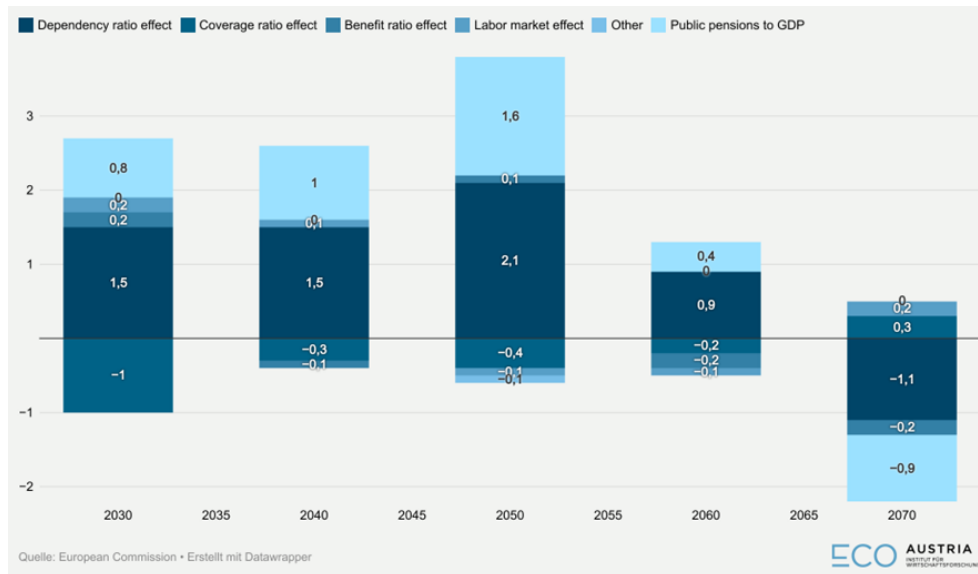


Future replacement rates in the Czech Republic will be similar to those of current pensioners among people with uninterrupted careers. More precisely, the theoretical replacement rate of a male worker at the average wage will increase between cohorts born in 1940 and in 1996 by about 3 percentage points. This small increase stems from a longer contribution history based on the rise in the retirement age from 61 for the 1940-born cohort to 65 in the future while other reforms had only minor effects. There is no life expectancy adjustment and, despite the increase in the retirement age, the share of adult lifetime spent in retirement is projected to increase among men between the generations born in 1956 and 1996.

In other OECD countries, legislated reforms will have much stronger effects on the replacement rates. In Mexico, Sweden and Poland, legislated deep-cutting systemic reforms imply a shift from unsustainable DB to (notional) DC schemes and have caused or will cause a substantial decline

in replacement rates. The OECD average will decrease by about 6 percentage points at normal retirement ages, or about 10%. (OECD, 2020)

Figure 19: Czech Republic: Components of change in public expenditure

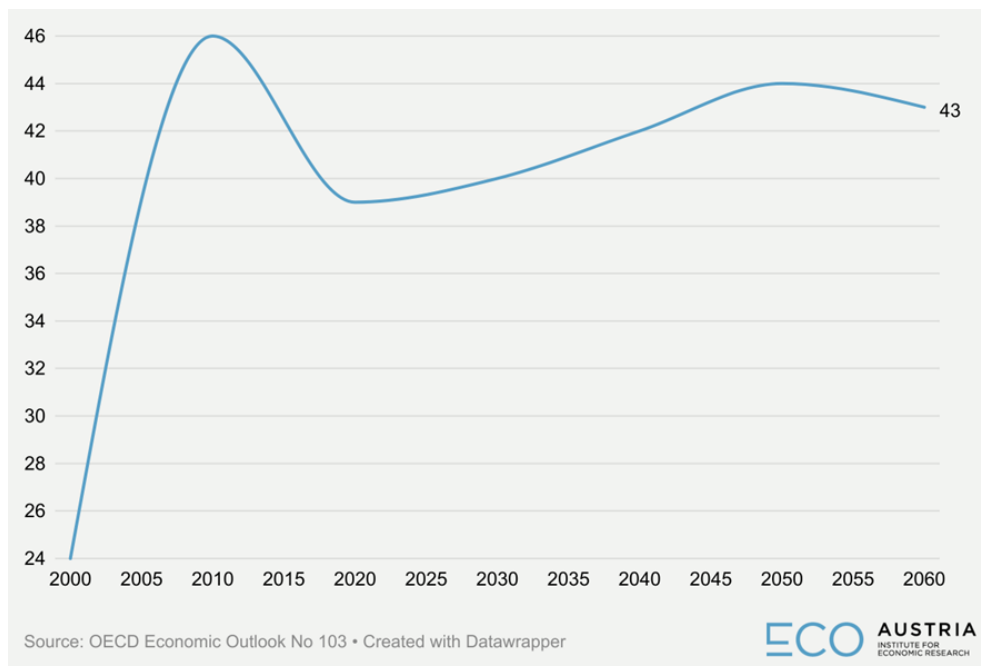


Forecast of debt levels

After a dramatic increase between the years 2000 and 2012, the government of the Czech Republic has managed to limit its general debt to about 38% in the year 2019. In the subsequent years, gross financial debt will clearly exceed 40%, yet remain confined despite the considerable rise in public expenditures. (Figure 20)⁹

⁹ Data can be downloaded at the OECD-Stat data platform at the [Weblink](#).

Figure 20: Czech Republic: Projection of long-term gross financial liabilities (in % of GDP)



2.4.4. The voluntary funded pension system

The Czech Republic established a voluntary funded defined contribution (DC) personal pension system in 1994. It corresponds to a 3rd tier pension, according to the classification model provided by the OECD (chapter 2.1). Since its creation, the Czech funded pension system has experienced several parametrical and structural changes.

Coverage

Nowadays, the coverage of the supplementary pension scheme is quite high. In 2019, 52% of the working-age population participated in the supplementary pension system. This is in the upper range when comparing internationally across voluntary funded pension systems.

Participation in supplementary pension scheme increases with age and income. Participation is below 20% for individuals aged 20 to 24 and below 40% for those aged 25 to 29. It is the highest for individuals aged 40 to 60, at or above 60%. Participation then declines but remains high. For example, in the 65-69 age group, around a third of seniors save. Participation also increases with income. More than 40% of individuals in the first quintile participate. It is about 70% for those in the last quintile. In addition, participation is higher for employees (61%) than for the self-employed (55%).

Total contributions paid by participants, employers and the state have increased steadily since 2013. In 2019, total contributions represented 1% of GDP. This is below the levels in voluntary systems in Canada, Portugal, New Zealand and the United Kingdom (between 2% and 3% of GDP), but above those in Austria, Hungary and Poland (0.3% of GDP).

The average level of contributions paid by participants remains low despite existing incentives. The minimum contribution for the participant is CZK 100 per month. However, average monthly

contributions remain below CZK 1,000 (around 3% of the national average wage in 2018), which is the maximum amount that the state matches. Older participants, higher income earners and self-employed workers pay higher contributions.

Tax Treatment

The state provides significant financial incentives for the supplementary pension system. State support consists in incentives for individuals, in the form of a favourable tax treatment and direct state contributions, as well as incentives for employers, by exempting employers' contributions from social insurance payments.

The tax treatment of supplementary pension savings can be qualified as "TEE", as contributions are partially taxed, while returns on investment and pension payments are tax free under certain conditions.

Contributions from participants into transformed and participating funds are paid from after-tax income. Contributions of CZK 300 up to CZK 1,000 a month are matched by state contributions. Contributions above CZK 12,000 a year are tax-deductible up to CZK 24 000 a year. Employer contributions are not considered as taxable income for the employee up to CZK 50,000 a year.

Investment regulations

The supplementary pension insurance scheme requires pension funds to guarantee a non-negative return on annual basis. Pension funds had to contribute 5% of profits to build a reserve fund. This reserve fund and other funds should be used to offset losses from negative returns, given the non-negative return guarantee. If such sources were insufficient, the loss had to be covered by a reduction of registered capital, which could not fall below a certain amount.

Investment performance

Investment returns have been mostly declining in the Czech Republic over the years, both in nominal and real terms. While, in nominal terms, the average performance of pension funds was 2.0% over the last 15 years (December 2004-December 2019), it was only 0.9% for the last five years (December 2014-December 2019). In real terms, the average performance has been null over the last 15 years and - 0.9% over the last five years.

In international comparison, the Czech Republic is among the OECD countries with the lowest average performance. In nominal terms, among countries with available data up to December 2018, pension funds in the Czech Republic recorded the lowest five-year average annual performance, and the second lowest in real terms after Turkey.

It is suggested that the low performance stems from conservative investment strategies due to the annual non-negative return guarantee which forces pension management companies to fulfil certain capital requirements. (OECD, 2020)

2.4.5. Highlights and main features of the system

1. Strengths and weaknesses (according to OPI)
<ul style="list-style-type: none"> - Low adequacy (OPI 0.5%), medium sustainability (OPI 0.69%) and low market capitalization (OPI 0.12%) - A main challenge the Czech pension systems faces is the low adequacy of its benefits. The guarantee minimum income pension has been only marginally adjusted since the 1980 and has therefore decreased drastically relative to wages. The pension scheme currently benefits from high employment rates and record-low income inequality from former Czechoslovakian contributors, but as the numbers of these pensioners diminishes, there will be an even more pressing need, to adjust and diversify the Czech pension system.
2. Tax treatment
<ul style="list-style-type: none"> - Pension plans in the Czech Republic are generally subject to an EEE tax regime, with the exception of individual contributions to supplementary pension plans (TEE)
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - Total contribution rate: 28%, 21.5% are covered by the employer while the remaining 6.5% are covered by the employee.
4. Asset Allocation
<ul style="list-style-type: none"> - Equities (2.4%), bills and bonds (81.8%), cash and deposits (12.0%), collective investment schemes (2.5%) and Other (1.3%)
5. Obligatory character
<ul style="list-style-type: none"> - The statutory old-age pension scheme covers virtually all wage-earners, some economically inactive individuals and certain groups are permitted voluntary contribution to this scheme
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - Voluntary supplementary pension savings scheme: life-long or fixed-term annuity, possibility for lump-sum pay-out, possibility of inheritance in the event of demise of the contributor
7. Contribution rate to funded plans
<ul style="list-style-type: none"> - Employees contributed 0.7% of GDP to funded pension plans in 2021 (or latest year available), while employers contributed 0.2% and the state 0.1%
8. Investment performance
<ul style="list-style-type: none"> - 10-year average investment rate of return 2011-2021: -1.0%. - At the same time the OECD average was 3.7%.

Additional information and results

- The Czech pension system consists of a public pension scheme and a voluntary funded private scheme. The public pension scheme has a basic element (1st tier) and an earnings-related part (2nd tier) calculated according to a progressive formula.

- The public expenditure on pensions is projected to increase sharply in the projection period, mainly driven by the old-age dependency effect.
- Replacement rates will remain constant for pensioners with uninterrupted careers.
- Funded pensions perform poorly, likely due to the minimum yield guarantee.

2.5. Germany

2.5.1. Demographic profile and demographic forecast

Germany faces a pronounced trend of an ageing and declining population working age population. From 2030 onwards, the overall population is expected to decline: in 2030 there will be 83.4 million people, in 2060 81.8 million. This development is accompanied by a significant increase in the age dependency ratios: the demographic forecast assumes an increase in the ratio of people over 65 years of age relative to the population aged 20 to 64 years from about 36 in 2019 to 54.6 in 2070 (Table 6). Life expectancy at the age of 65 is expected to increase from 19.5 years in 2030 for men to 23.4 years in 2070 and from 22.5 years for women to 26.4 years in 2070.

Table 6: Germany: demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	83,077	83,442	83,163	82,631	81,812	81,711	83,077 → 81,711
Population growth rate	0.2	0.0	0.0	-0.1	-0.1	0.0	0.2 → 0
Old-age dependency ratio (pop65+/pop20-64)	36.1	46.4	52.2	52.8	54.3	54.6	36.1 → 54.6
Old-age dependency ratio (pop75+/pop20-74)	16.3	17.8	23.6	26.2	25.6	27.4	16.3 → 27.4
Ageing of the aged (pop 80+ / pop 65+)	30.8	28.9	33.0	42.4	39.2	42.0	30.8 → 42
Men - Life expectancy at birth	79.1	80.6	82.1	83.5	84.8	86.0	79.1 → 86
Women - Life expectancy at birth	83.7	85.1	86.4	87.7	88.9	89.9	83.7 → 89.9
Men - Life expectancy at 65	18.4	19.5	20.5	21.5	22.5	23.4	18.4 → 23.4
Women - Life expectancy at 65	21.4	22.5	23.6	24.6	25.5	26.4	21.4 → 26.4
Men - Survivor rate at 65+	86.6	88.8	90.4	91.8	93.0	94.1	86.6 → 94.1
Women - Survivor rate at 65+	92.5	93.7	94.6	95.4	96.1	96.6	92.5 → 96.6
Men - Survivor rate at 80+	58.8	64.4	68.9	73.0	76.6	79.7	58.8 → 79.7
Women - Survivor rate at 80+	74.6	78.6	81.7	84.4	86.7	88.7	74.6 → 88.7
Net migration (thousand)	277.4	248.2	240.7	227.0	221.4	214.2	277.4 → 214.2
Net migration over population change	1.6	-11.8	-7.9	-3.0	-3.4	7.9	1.6 → 7.9

Source: European Commission • Created with Datawrapper

Regarding the development of migration inflows, Eurostat's demographic forecast assumes a steadily decreasing net migration starting from a level of 277,400 in 2019 to 221,400 in 2060 and 214,200 in 2070. Migration is therefore expected to only partially offset the trend of population decline.

A moderate increase of the average labour market exit age is expected for the period from 2020 to 2030. By 2030, the average exit age will increase from 64.7 years for men in 2020 to 65.7 years and from 64.5 years to 65.3 years for women. From 2030 onwards, no further increase is forecasted (Table 7). In line with the constant development of the average retirement age, the duration of retirement for men is expected to increase from about 18 years to 20 years in 2070 and for women from 22 years to 24.5 years. Accordingly, also the percentage of time spent in retirement is expected to increase by more than 4 percentage points for both men and women.

Table 7: Germany: Exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labour market exit age (CSM) - Men	64.7	65.7	65.7	65.7	65.7	65.7	
Duration of retirement - Men	18.4	18.7	19.7	20.7	21.6	22.5	
Percentage of adult life spent in retirement - Men	28.3	28.2	29.2	30.3	31.2	32.1	
Early/late exit - Men	2.3	1.1	0.9	1.0	0.9	1.0	
Average labour market exit age (CSM) - Women	64.5	65.3	65.3	65.3	65.3	65.3	
Duration of retirement - Women	21.4	22.5	23.6	24.6	25.5	26.4	
Percentage of adult life spent in retirement - Women	31.5	32.3	33.3	34.2	35.0	35.8	
Early/late exit - Women	2.6	1.2	1.0	1.2	1.0	1.2	

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

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The role of migration

A part of the negative population development is compensated by migration. In the scenario without migration, a far greater decline in the working-age population aged 20 to 64 is expected. Based on a working-age population of 49.4 million in 2022, the population in the no-migration scenario would decline to 38.8 million by 2050 and 34.5 million by 2060. In the scenario with migration, there is also a population decline, but the decline is much less pronounced. In the scenario with migration, the referring working-age population will only decline to 46.1 million people in 2050 and to 44.8 million in 2060. In this respect, migration will compensate for a part of the decline in the working-age population (Figure 21).

However, positive net migration is not able to compensate for the overall decline in the working-age population. The old-age dependency ratio is still expected to increase from about 37 in 2022 to about 50 in 2050 and further to 52.6 in 2060, even in the population scenario with migration (Figure 22). Given the assumptions from the demographic projection and assuming the same age-structure and fertility between migrant and resident population, net migration necessary to hold old-age dependency ratio constant from 37.3 in 2022 (Figure 22) would be much higher compared to yearly net migration of 220,000 to 280,000 people projected (Table 6). Assuming an old-age-dependency-neutral migration, average annual net migration would have to exceed by far the levels projected within the scope of the Ageing Report. This is particularly true for the period up to 2030 and beyond to 2040, when average annual net migration would have to be 1.32 million and 0.96 million, respectively, to keep the old-age dependency ratio at the 2022 level.

Figure 21: Germany: demographic forecast with and without migration (2022-2060) ¹⁰

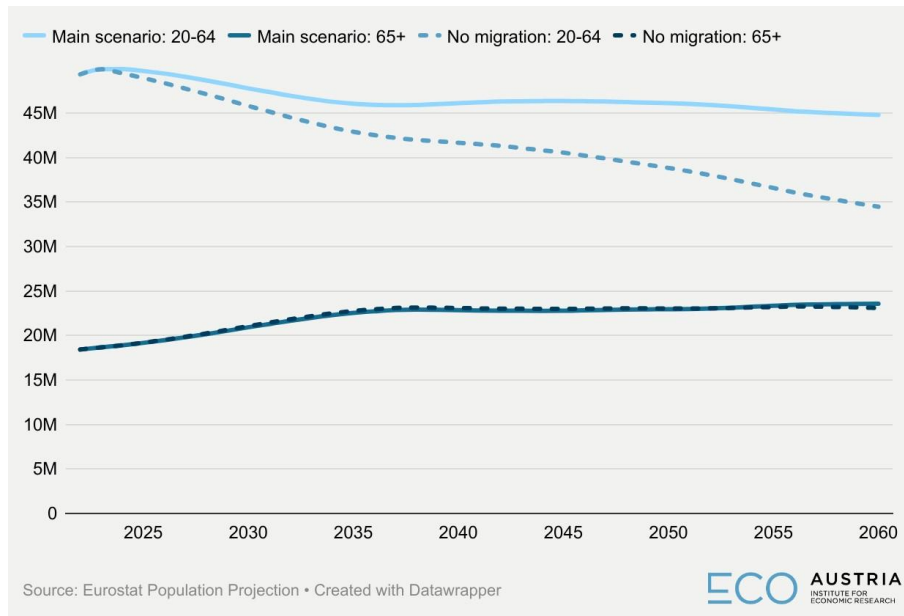
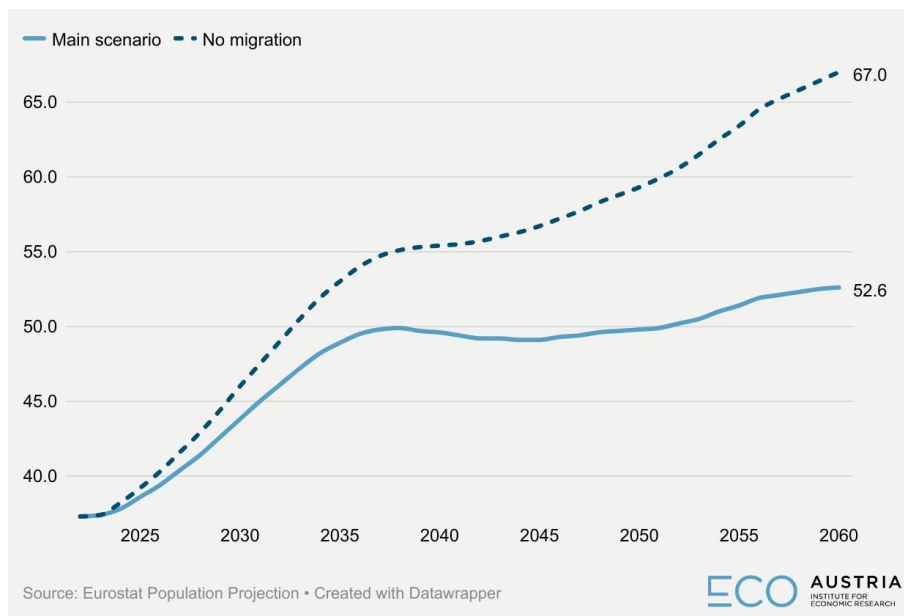


Figure 22: Germany: old-age dependency ratio (65+/20-64) in the main scenario and without migration



2.5.2. General architecture

According to national and country-specific sources, the general architecture of the German pension system is commonly described as a 3-pillar pension system.¹¹ Whereas 1st pillar pensions from the statutory pension scheme are mandatory for employees and civil servants, the 2nd pillar occupation pensions and 3rd pillar private pensions are both non-mandatory. However, the latter

¹⁰ The corresponding data for this section is taken from the population projection, published by Eurostat under the data code „PROJ_23NP“. The values might differ from those in the ageing report.

¹¹ General information for the German pension system is published by „Deutsche Rentenversicherung“ via [Weblink](#).

two schemes are tax-promoted and subsidised by the state. According to the 3-tier classification model by the OECD (Section 2.1), the overall pension system comprises:

- The guarantee of a minimum subsistence level for elderly persons (**first tier**) is not a principal function of the German old age pension system but is attained through special social assistance measures (“Grundsicherung im Alter”). The scheme is entirely tax-financed out of the general federal budget.
- The public statutory pension system provides for **second tier** functionalities. The benefits are earnings-dependent and are oriented towards equivalence of contributions and benefits. Benefits are based on compulsory contributions and pension entitlements that result from contribution payments or from substituting periods. The statutory pensions provide for earnings-related old-age pensions as well as for survivors’ pensions and disability pensions. Financing is based on PAYG principles.
- The German pension model provides also for forms of supplementary or additional occupational pensions (**funded second tier**). These schemes (“Betriebliche Altersvorsorge”) are not legally required but are anchored in collective agreements. Occupational pensions are either organised by the employers or contracted between the employers and institutional pension providers and funds. Employers can choose between several forms of implementation and funding. The employer either finances pension contributions completely or bears a part of the contributions together with the employees.
- **Third tier** individual pension plans are voluntary. Individuals choose their personal form of old-age income provision. Individuals may choose an institutional pension funding plan from a range of licensed insurance products.

Qualifying conditions

The requirements for receiving a standard old-age pension are reaching the eligibility age and fulfilling a minimum insurance period. According to the Federal Ministry of Labour and Social Affairs (BMAS)¹² a standard old-age pension (“reguläre Altersrente”) is payable after a qualifying period of 5 years. No entitlement is associated with an insurance record of less than 5 years (OECD 2021g).

Current and future retirement age

The pensionable age is gradually increasing to 67 years for both men and women by the year 2031. In 2031 the standard pensionable age of 67 will apply to those born in 1964 or later. Due to the gradual increase of the retirement age dependent on the year of birth, no general retirement age is prescribed in the adjustment period until 2031. In 2023 the retirement age is 66 years and applies to people born in 1958.

Early retirement is possible for persons with long-term insurance records. Individual benefits will be reduced permanently by 0.3% (“Abschlag”) for each retired month pensioners fall short of the statutory retirement age. On the other hand, postponement of retirement will yield a higher

¹² Information is provided via BMAS’s [Weblink](#).

pension accrual of 0.5% for each month worked after the statutory retirement age. Early retirement is possible at the age of 63 for persons with an insurance record of at least 35 years equivalent to the condition of long-term insurance. Because the increase of the standard retirement age to the age of 67 by 2030, the maximum permanent deduction will increase to 14.4%.

As regards the penalty for early retirement, here exists specific exemptions for persons with an “exceptionally long” (according to MISSOC information¹³) insurance record of at least 45 years. Such persons are considered “besonders langjährig Versicherte”. They can temporarily claim old-age pension without deductions currently at the age of 63 and 8 months. Given the raise of the legal retirement age from age 65 to age 67, the age of 63 for an old-age pension without any penalties (under the requirement of 45 contribution years) will also raise gradually up to the age of 65 by the year 2029.

First-tier and second-tier pensions by the public pension scheme

The statutory pensions are based on compulsory contributions and pension entitlements that result from contributory payments or from substituting periods that are derived, for example, from caring for children and dependents. Public pensions provide for old-age pensions as well as for survivors’ pensions and disability pensions. Financing is based on PAYG principles. No pension assets accumulate for the funding of pension entitlements. The majority of employees and all civil servants are covered by the first compulsory insurance scheme. Insurance is compulsory for all employees and certain groups of self employed. Voluntary insurance is possible for all persons over the age of 16 years living in Germany and for all Germans abroad.

The recent introduction of a basic pension (“Grundrente”) provides for a compensation of lower earnings and thus weakens the principle of equivalency. Nevertheless, minimum income provision is provided only in combination with totally tax-financed and means tested social assistance payments (“Grundsicherung im Alter”). The statutory pension system itself does not provide for a minimum income in the first tier. The statutory pension system is operated and administrated by the German Federal Insurance Fund (“Deutsche Rentenversicherung”). The civil servants pension scheme is operated by the Federal Ministry of the Interior.

The receipt of benefits from the statutory pension system depends on episodes of employment and/or insurance and on the length of insurance periods. In the first place these are episodes of compulsory insurance and contribution payments from employment. Certain periods are treated as compulsory contribution periods for both the calculation of pensions and for the fulfilment of the waiting period. These are, according to MISSOC, child-raising periods up to a maximum of 3 years per child, periods of informal or family care, periods of statutory military or civil service and periods of receiving benefits. Some episodes are accounted for the pension calculation depending on the type of pension. Such accounted periods (“Anrechnungszeiten”) are periods of sickness, rehabilitation, pregnancy and maternity, during unemployment, or with receipt of

¹³ MISSOC (Mutual Information System on Social Protection) is a database providing institutional information on the welfare systems of EU Member States. The information is accessible via [Weblink](#). MISSOC is based on a co-operation between the EU-Commission, national correspondents and a MISSOC Secretariat, managed by the project partners LISER and Applica under contract to the European Commission.

pensions, studies or higher education over the age of 17 years. Periods of child-raising up to the age of 10 are accounted as consideration periods (“Berücksichtigungszeiten”). Periods of war military services or of detention due to political reasons before 1992 are recognized as substitute periods (“Ersatzzeiten”).

Calculation of benefits

The German statutory pension system is often described (EU 2020d, Ageing Report Country Fiche for Germany) as being oriented towards contribution equivalence (“Äquivalenzprinzip”), which basically translates the amount of individual pension-related contributions into similar pension entitlements. The calculation of pension benefits refers to a so-called points system. Determining factors according to MISSOC are essentially the amount of contributions during the entire working life, years of employment and contribution payments, substituting qualifying periods such as child and/or family care and voluntary contributions. The monthly pension benefit *mPB* is calculated by multiplying (1) the sum of personal earning points **PEP** (for “Persönliche Entgeltpunkte”) determined during the insured life by (2) a pension type factor **RA** (for “Rentenartfaktor”), an (3) access factor **ZF** (for “Zugangsfaktor”) and current pension value **aRW** (for “aktueller Rentenwert”).

The pension formula for the calculation is:

$$mPB = PEP \times RA \times ZF \times aRW.$$

(1) The sum of earning points (“persönliche Entgeltpunkte”, PEP) results from the insured earnings for each year divided by the national average of earnings for the same year, in addition to PEP for specific non-contributory periods and supplements for such reduced contribution periods. For each year of contribution, a person receives pension points, which reflect the employees’ relative earnings position in a given year. A years’ contribution at the level of average earnings of contributors results in one pension point. Of an employee has an insurance record over his or her working life of 45 years, for which his or her earnings exactly equal average earnings, a PEP-sum of 45 times 1 is accumulated. Higher contributions lead to higher pension benefits. Yearly contributions and entitlements resulting from these contributions are levied on annual earnings up to a ceiling of approximately 200% of the relevant average earnings. From 2021, additionally, individuals with low earnings and at least 33 years of mandatory contributions and certain other relevant periods are granted a pension supplement called “basic pension” (beneath).

(2) The sum of earning points PEP is multiplied by a pension type factor (“Rentenartfaktor”, RA). This RA reflects the pension type and the referring income target. A standard old-age pension is calculated with a pension type factor of 1. It is 0.55 as regards a survivors’ pension.

(3) The mathematical product of the sum of personal earning points PEP and the pension type factor RA is multiplied by the access factor ZF (“Zugangsfaktor”). The ZF follows the age of the insured at the start of pension payments and effects reductions (“Abschläge”) in the case of early pensions or increases (“Zuschläge”) in the case of a pension deferment after the standard retirement age has been reached. The ZF balances the advantages and disadvantages of different pension entitlement periods. Early retirement is expected to be associated with a longer

retirement period and vice versa. The ZF equals 1 if a person's retirement period starts exactly from the statutory retirement age. If an old-age pension starts earlier, it is less than 1.0, and if the pension starts later than the standard retirement age, it is greater than 1.0.

(4) The mathematical product of the sum of personal earning points PEP, the pension type factor RA and the access factor ZF is multiplied with a current pension value ("aktueller Rentenwert", aRW). This aRW corresponds to the monthly old-age pension from the statutory pension insurance without reductions, if contributions were paid on the basis of average earnings over the referring calendar year. The current pension value AR is institutionally defined annually on 1 July. The adjustment is basically in line with changes in wages and salaries (MISSOC). The current pension value as of 1 July 2022 amounts to 37.6 Euro for both the old and the new "Bundesländer". The current pension value forms the basis for the adjustment and indexation of pension benefits paid.

From 1 January 2021 the pension is increased by an individually calculated supplement if there are at least 33 years of "basic pension periods". The latter correspond mainly to compulsory contribution periods from employment, child care and care work. The calculation basis is the earning points (EP) earned from the "basic pension assessment periods". These include only those basic pension periods that reach an institutionally defined minimum value of at least 0.025 EP per month and 0.3 EP per year, equivalent with 30% of average earnings in the respective year. If, in the case of "5 years of basic pension periods" the average value of all "basic pension assessment periods" is less than 80% of the average earnings (= 0.8 EP/year), a supplement is calculated for a maximum of 35 years of basic pension assessment periods. In the transitional period between 33 and 35 years, an accumulating basic pension supplement is calculated. The basic pension benefit compensates for insurance periods with lower earnings. It is granted depending on income. Basic pension benefits mitigate the principle of equivalency downwards to lower earnings. However, the basic pension is not a component of minimum income provision inherent to the statutory pension system. Minimum income is provided in combination with social assistance benefits.

Indexation and adjustment of benefits

The indexation and adjustment of benefits is based on the current pension value "aktueller Rentenwert" (above). The current pension value is therefore relevant for new pensioners and for the adjustment of benefits for existing pensioners. The adjustment is made on the basis of a benefit adjustment formula ("Rentenanpassungsformel"). As a starting point the adjustment mechanism takes the development of gross wages into account. This is done based on a wage factor in the adjustment formula. In addition, a contribution factor accounts for changes of the contribution rate to the statutory pension scheme and to the subsidised (voluntary) private pension schemes. An increase in the contribution rates under the statutory pension insurance and also of the financing share for private voluntary pensions ("Altersvorsorgeanteil zur Riemer-Rente") increases the financing burden on the employed population, while pensioners benefit from increased contributions without sharing in the costs. By the contribution factor taken into account in the adjustment formula transfers a part of this financing burden to the retired population at the expense of a slower benefit adjustment. By another factor in the adjustment formula financing

pressures from increasing old-age dependency ratios are considered. This is based on a sustainability factor (“Nachhaltigkeitsfaktor”). If the number of contributors falls compared to the number of pensioners, which is to be expected in the medium and longer term in view of demographic developments, then the sustainability factor will lead to reductions in pension adjustments.

The latter two adjustment factors are expected to slow down the indexation of pension benefits paid. If wages stagnate and even more so if they fall, the adjustment formula would lead to a reduction in nominal pensions. To prevent this, a safeguard clause has been built into the pension adjustment formula. It guarantees that nominal pensions may not decrease. However, in the case that adjustment reductions are omitted, they have to be made up to a later stage. This requirement then has a negative effect on the adjustment in the following years. A catch-up factor then additionally slows down the pension adjustment over several years

Disability pensions (“Erwerbsminderungsrente”)

Persons below the statutory retirement age who partially or completely, temporarily or permanently incapacitated for work, are eligible to disability pensions from an insurance period of 5 years (EU 2020d, Ageing Report Country Fiche for Germany, p. 6). A working capacity of less than three hours per day is equivalent with a complete loss of earning capacity and a full disability pension is granted by a pension type factor (RA, see above) of 1.0. A partial reduction in earning capacity is recognised if the person works between three and six hours per day. In such cases, a partial disability pension is granted with an RA factor of 0.5. Disability pension entitlements are calculated by the pension points already accrued before the recognition of the invalidity status and additional pension points based on an assumption of future contributions according to the course of the previous employment career. An evaluation (“Günstigerprüfung”) takes place as to whether the last four years before the disability status would have a negative impact on the benefit amount. If the last four years before the reduction in earning capacity would reduce the entitlement, these four years are omitted from the calculation (Deutscher Bundestag 2023, p. 6). Deductions are calculated if pensions are claimed before the standard retirement age. For each month before the standard retirement age is reached, a deduction of 0.3% is made to the pension benefit (above). In connection with the claiming of a disability pension, the maximum deduction is limited to 10.8% (Deutsche Rentenversicherung 2023, p. 17).

Survivors’ pensions

If the minimum insurance period of 5 years is fulfilled by a deceased person, spouses are entitled to a survivor’s pension. The marriage or (civil) partnership must have existed for at least 1 year. The amount of the widow’s pension depends on the surviving spouse and his/her characteristics. A “high” widow’s pension (“große Witwen- und Witwerrente”) is credited if the surviving spouse is himself or herself incapacitated, is raising an underage child or is at least 45 years old. The high rate widow’s pension is equivalent to 55% of the deceased’s full pension benefit. If the surviving spouse does not meet the above criteria, a small survivor’s pension (“kleine Witwen- und Witwerrente”) is paid. The small pension equals 25% of the deceased person’s full pension. It is

limited to a maximum benefit period of 2 years. It is designed as a bridging or transitioning benefit until such time as survivors are able to provide for their upkeep.

Children of deceased insured persons are entitled to an orphan's pension. A requirement for the payment of the orphan's pension is that the deceased has fulfilled the general qualifying period or "waiting period" before his death. This means that he or she has paid pension insurance contributions for at least 5 years or has already received payments from the statutory pension insurance. The orphan's pension is intended to compensate for the loss of maintenance by the deceased in the event of the death of one or both parents. Orphan's pension is generally paid until the age of 18. During studies, school or vocational training or voluntary service, orphans may also receive an orphan's pension beyond the age of 18, but at most until the age of 27. The amount of an orphan's pension is also related to the full pension benefit of the deceased, with one-tenth for half-orphans and one-fifth for double orphans.

The combination of an own pension entitlement plus a survivor's pension leads to a reduction of the survivor's pension.

Funded second and third tier pensions

In Germany, the public statutory pension insurance fulfils the 2nd tier function of income-related benefits. It guarantees equivalent income- and contribution-based benefits and provides a certain degree of maintenance of the living standard. In addition to the public pension scheme, the German system also includes funded 2nd and 3rd tier components. These two are usually referred to in the country-specific literature as the second and third pillars of the German pension system. Second tier occupational pensions and third tier private pensions are both non-mandatory. However, both schemes are tax-promoted and subsidised by the state.

Occupational pensions ("Betriebliche Altersvorsorge") are completely and privately funded. Occupational plans are voluntary, however they are often laid down in collective agreements¹⁴. According to the Federal Ministry for Labour and Social Affairs this is the case for "most" of the occupational sectors¹⁵. According to IOPS (Country Profile Germany 2019b) more than the half of the employees are covered by occupational pension plans. Employees can demand that their employer convert parts of their wage or salary into an occupational pension plan.

The employer finances pension entitlements by contributions or savings either completely or it finances a part of the contributions together with the employees. Employees have the option of converting part of their wage or salary in the form of so-called "Entgeltumwandlung", translated by OECD authors as "salary conversion" (OECD 2021a, p. 11), into a company pension scheme in order to receive a company pension later. Also, mixed financing is possible and widespread in practice. Within the scope of the "Entgeltumwandlung" the employee's contribution is paid into an occupational funding plan by the employer. The payment is made before any tax is deducted.

The employers choose the form of implementation and the pension provider dependent on the form of implementation. In some companies, occupational pensions are regulated in the

¹⁴ Information is provided by „ihre Vorsorge“, an initiative of „Deutsche Rentenversicherung“ via [Weblink](#).

¹⁵ Information is provided by BMAS via [Weblink](#).

employment contracts or in a company agreement. In many occupational sectors, the type of occupational pension is laid down in collective agreements. Occupational saving plans are either organised and managed by the employer itself. Employers can also use the services of external providers for the organisation of occupational pension plans. Occupational pensions may take several forms of implementation. These are direct pension commitments by the employers (“Direktzusage”), contributory payments into support funds (“Unterstützungskassen”), direct life insurances or contracts between the employer and institutional pension providers (“Pensionskasse”¹⁶ or “Pensionsfonds”¹⁷). Within the scope of direct commitments, the employers commit to paying pension benefits themselves. No institutional pension provider is involved. The employer forms pension provisions in his balance sheet and bears the resulting risks. By contributory payments into support funds (“Unterstützungskassen”) the employer pays contributions into a fund. This institution provides retirement benefits. There is no legal claim to benefits from the support fund.¹⁸ Another option is, that the employer takes out direct life insurance for his employees. Here, the employee is both the insured person and the beneficiary. Direct commitments are the most important implementation form for occupational pensions (Clemens und Förstemann 2015).

According to the country profile from IOPS (2019, p. 2) the contributions rates are determined by collective agreements. Tax legislation allows contributions of up to 4% of earnings to be paid into cash-balance plans. Benefits from occupational pension plans must be paid out in the form of a life-long annuity in order to benefit from tax exemption. In case of occupational pension plans managed by a pension funds (“Pensionsfonds”) benefits must be paid out according to a payment plan.

Occupational pension provision is supported by the state, mainly through tax instruments. According to information from the Federal Ministry of Labour and Social Affairs¹⁹, occupational pension contributions paid into a “Pensionskasse”, a “Pensionsfonds” or a direct insurance (“Direktversicherung”) during working life are exempt from income tax and social security contributions up to certain limits. Up to these limits payments – for instance in the form of “Eigentumsumwandlung” – can flow into the occupational pension before taxes are deducted. Occupational pensions are only taxed when they are paid out later. Furthermore, they are only then subject to compulsory contributions to the statutory health and long-term care insurance. As regards health insurance contributions a tax allowance for health insurance contributions of compulsorily insured persons was introduced in 2020. In the context of the promotion of occupational pension provision, it should be noted that the entitlements to the statutory pension are reduced because the earnings relevant as a basis for calculating the pension entitlement in the statutory pension insurance are reduced.

¹⁶ Pensionskassen are life insurance undertakings that exclusively provide cover against loss of income.

¹⁷ Pensionsfonds provide occupational retirement pension (ORP) benefits and death grants for surviving relatives. They are not considered insurance undertakings under German law and are subject to the supervision of the Federal Financial Supervisory Authority („Bundesanstalt für Finanzdienstleistungsaufsicht“ BaFin).

¹⁸ Information is provided by the Bundesanstalt für Finanzdienstleistungsaufsicht via [Weblink](#).

¹⁹ Information is published by BMAS via [Weblink](#).

Since 2018, the build-up of an occupational pension for low wage earners has been promoted through special tax instruments. Employers who pay contributions into occupational pension schemes for employees with a current gross income of up to 2,575 euros receive a state subsidy. It amounts to 30% of the contribution paid by the employer in addition to the salary to a "Pensionsfonds", a "Pensionskasse" or for a direct insurance policy ("Direktversicherung").

3rd tier individual pension plans are voluntary. Individuals choose their personal form of old-age income provision. Individuals may choose an institutional pension funding plan from a range of licensed insurance products. This can take the form of a so-called "Riester-Rente", "Rürup-Rente" or "Basis-Rente"²⁰. The state promotes private pension insurance through subsidies ("staatliche Zulage") and tax incentives. To benefit from tax incentives, the chosen insurance scheme must be licensed and meet legal requirements²¹.

The so-called "Riester-Rente" is the main product for all insured persons under the social security system. The requirements for claiming public subsidies are defined by law in the "Altersvorsorgeverträge-Zertifizierungsgesetz" (Retirement Provision Contracts Certification Act). Eligible insurance products must be licensed by the "Bundeszentralamt für Steuern" (Federal Central Tax Office). At least the sum of all paid-in contributions, i.e. the insured person's own contributions plus the state allowance, must be guaranteed at the start of the pay-out phase. Thus, providers must guarantee a minimum benefit guarantee (IOPS 2019b, p. 3). Benefits may be paid out from the age of 60 at the earliest, or from the age of 62 for contracts concluded from 2012 onwards. Benefit must be paid as lifelong pension payments. The state promotes the "Riester-Rente" by subsidizing the customer's payments with allowances ("Zulage"). The allowance is staggered according to the contribution rate. With a contribution of 4% of the income from the previous year, the maximum allowance of currently up to 2,100 Euro per year is paid out. In addition to the contribution subsidy, the "Riester Rente" is also tax-subsidised. "Riester" products are taxed according the EET formula (beneath). This means contribution and investment income are tax-exempt, while the benefits are taxed in the pay-out phase.

While the "Riester-Rente" is aimed at socially insured salaried employees, the "Basis Rente" is aimed at the self-employed und members of liberal professions. It is also called the "Rürup Rente" after the economist Bert Rürup, who played a decisive role in the development of the "Basis Rente". The "Basis Rente" is a private old-age provision, promoted by the state. Legal conditions are defined in the Retirement Provision Certification Act, similar to the "Riester Rente". Subsidisable insurance products must be licensed. It is intended as an equivalent to the "Riester Rente" for persons who have a higher taxable income in the contribution phase but cannot claim a "Riester pension" due to a lack of compulsory insurance for statutory pension insurance. This applies in particular to the self-employed and members of liberal professions. Contribution payments are tax-deductible. The legal requirements for tax deductibility are comparable to the "Riester Rente". Benefits from pension insurance are taxed in the pay-out phase. Benefits may

²⁰ Information is provided by „Deutsche Rentenversicherung“ via [Weblink](#).

²¹ Information is provided by Deutsche Rentenversicherung via [Weblink](#).

be paid out from the age of 60 at the earliest, or from the age of 62 for contracts concluded from 2012 onwards. In the pay out phase, a lifelong monthly pension must be paid out.

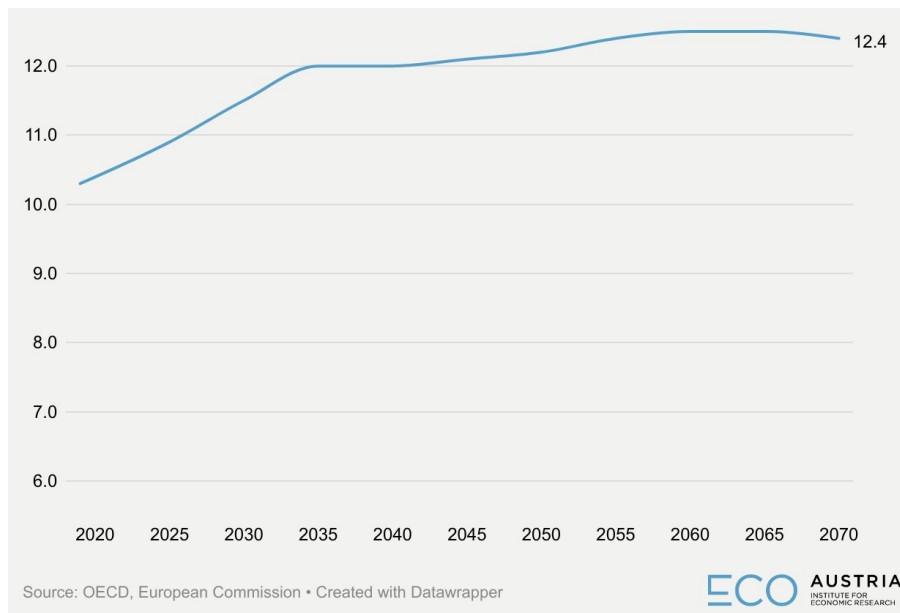
2.5.3. Public pensions fiscal challenges

Public expenditure on public pensions

Public expenditure on pensions is expected to increase from 11% to 12% of GDP until 2035. After 2035 the increase of public expenditure will slow down. Public expenditure for pensions will be 12.5% of GDP in 2060 and 12.4% in 2070 respectively. The dynamics of pension expenditure can be broken down into the dependency ratio, the coverage ratio, the benefit ratio and the labor market effect.

The **dependency ratio** effect reflects the evolution of the ratio of the elderly (population aged 65 and over) to the working-age population (population from 20 to 64 years). While this ratio is 37.3 in 2022, it is projected to rise drastically to about 52.6 in 2060 (Figure 22). In the absence of other effects offsetting these adverse dynamics, the increase of the dependency ratio would cumulatively increase public pension expenditure by about 4.9 percentage points of GDP up to 2070 compared with 2019 (Figure 24). The demographic trend of ageing is the main driving force related to the pension expenditure development over time. Fiscal pressures due to ageing are increasing, especially until the mid-2030s. This is due in particular to the retirement of the baby boom generation.

Figure 23: Germany: Forecast of public expenditure on pensions (in % of GDP)



The reduction of the **coverage ratio** goes back predominantly to the enacted legal changes assuming an increase of the statutory retirement age to 67 years in 2031. The increase of the statutory retirement age results in postponing the effective retirement age for future pensioners (EU 2021d, Ageing Report Country Fiche for Germany, p. 18). According to the definition of the

coverage ratio within the scope of the Ageing Report, this will lower the coverage ratio. The decline of the coverage ratio is expected to partially offset the fiscal pressure of the old-age dependency effect. This effect shows its impact especially until 2030. After 2040, its importance will decrease.

The labour market effect, and here the so-called employment ratio effect, is of much less importance. The postponement of the retirement age does contribute to an increase in the labour force participation of older people. This leads to a reduction of pension spending. However, the significance of the labour market effect is marginal and is most likely to be visited, if at all, until 2030.

Rising fiscal pressures from ageing are primarily compensated for by falling benefit ratios. The benefit ratio mitigates the increase of pension expenditures compared to GDP substantially. This is mainly a consequence of the institutional arrangement in indexing and adjusting pensions (“Rentenanpassungsformel”). According to the country fiche information from the German Ageing Report (p. 19), the sustainability factor (“Nachhaltigkeitsfaktor”), which accounts for the ratio of pensioners to contributors, will decelerate the future nominal increase of the pension point value as compared to an adjustment based on wage growth solely. In addition, as the penalty deductions for early retirement – introduced in the late 1990s – will increasingly unfold their full impact. As a result of this smoothening of benefit indexation, the benefit rates of statutory pensions are expected to fall. As indicated in Figure 25, the replacement rate at retirement is expected to decrease from 40 % to 37 % over the projection horizon. The total benefit ratio is expected to fall from 42% to 39% in 2040 and will remain at 40% over the full projection horizon.

Figure 24: Germany: Components of change in the public expenditure

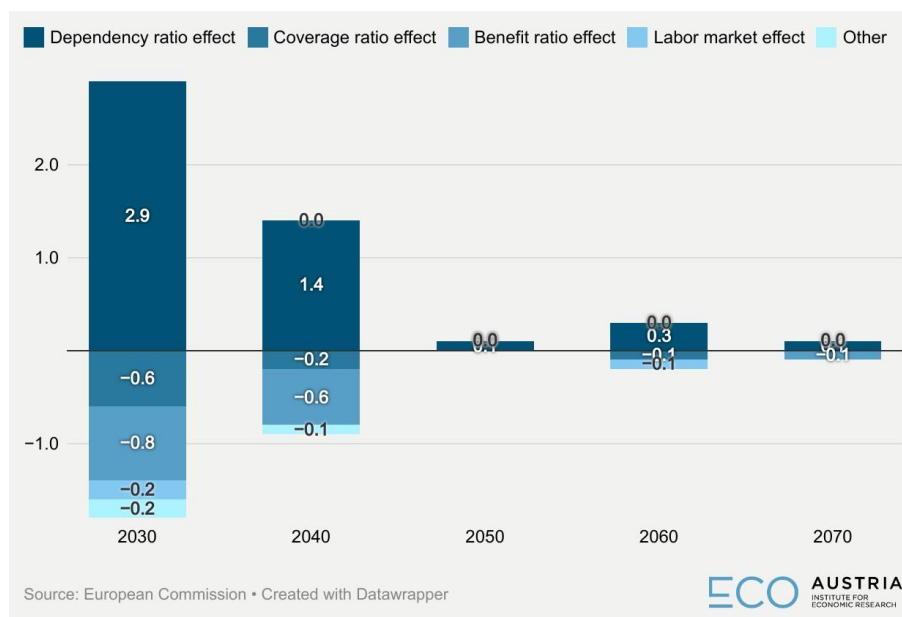


Table 8: Germany: Benefit ratio and replacement rates until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Public scheme (BR)	42%	40%	39%	39%	39%	39%	-3.0
Public scheme: old-age earnings related (BR)	39%	39%	38%	38%	38%	38%	-1.0
Private occupational scheme (BR)							
Private individual schemes (BR)							
Total benefit ratio	42%	40%	39%	39%	39%	39%	-3.0
Total replacement rate	40%	38%	37%	37%	37%	37%	-3.0

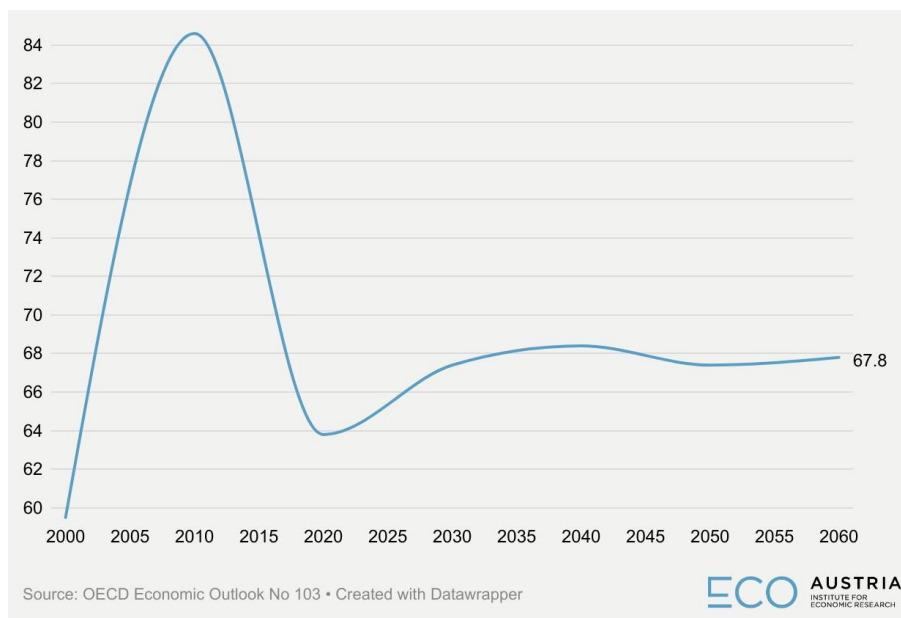
Source: European Commission • Created with Datawrapper

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Forecast of the debt levels

As is the case for other countries in this country comparison, Germany is also affected by an increase in public debt until 2035 and 2040. The increase is moderate, but nevertheless observable (Figure 25). According to OECD’s long-term economic outlook, long-term gross financial liabilities are expected to increase from 64% of GDP in 2020 to 68% in 2040. Government consolidated debt was 66.3% of GDP in 2022. This puts Germany below the comparative values for the Eurozone (91.5%) and the EU 27 (84%).

Figure 25: Germany: Projection of long-term gross financial liabilities (in % of GDP)



According to the EU Commission’s Sustainability Report for 2021 (DG-ECFIN 2022), Germany is one of the countries with a medium sustainability risk for both the short-term S1 indicator and the long-term S2 indicator.

2.5.4. Funded Pensions (Second and third tier)

According to country-specific sources, the German pension system is commonly described as a 3-pillar model (EU 2020d, Ageing Report, Country Fiche for Germany). Whereas the statutory pensions are based on PAYG financing, occupational pensions and individual pensions are both non-mandatory. However, both schemes are tax-promoted and subsidised by the state. As described above, both systems are institutionalised and standardised by law within the framework of public subsidies and tax incentive instruments. Against this background, private and occupational forms of old-age provision play an important role in the German overall pension system. Pension policies aim to ensure that cuts in the generosity of benefits from the statutory pension scheme are compensated for by the build-up of capital and entitlements from privately financed schemes. According to the Ageing Reports Country Fiche information for Germany within the scope of the Ageing Report (EU 2020d, p. 14), occupational and private pension schemes have gained widespread acceptance, as a consequence of governmental promotion and tax treatment. The number of occupational pension entitlements among active employees increased from 14.6 million in 2001 to about 21.0 million and the number of “Riester”-contracts in place reached a level of 16.4 million by the end of June 2020. It is assumed that about 66% of all employees between ages 25 to 65 with compulsory social insurance coverage are entitled to a supplementary occupational pension or a “Riester”-pension (EU 2020d, EU Ageing Report Country Fiche for Germany, p. 14).

According to OECD’s Pension Markets in Focus the coverage of funded and private pension plans is at a medium level in international comparison. As regards voluntary occupational pensions the coverage in percent of the working age population is 54%. The coverage of voluntary personal plans in the form of “Riester”-contracts is 30%. Thus, private and funded pensions are only higher in countries with mandatory or quasi-mandatory participation, for example Sweden, Denmark or the Netherlands.

The key regulatory and supervisory authority for funded pensions is the **Federal Financial Supervisory Authority** (“Bundesanstalt für Finanzdienstleistungsaufsicht” BaFin). According to information from the IOPS country profile for Germany (IOPS 2019), BaFin supervises occupational plans from insurance providers (“Pensionskassen”, “Pensionsfonds” and “Direktversicherungen”) as well as insurance companies providing individual “Riester”-pensions or “Rürup”-pensions. BaFin operates under the framework of the Act on the Federal Financial Supervisory Authority (“Finanzdienstleistungsaufsichtsgesetz” FinDAG). This law integrates several areas of financial supervision into BaFin as single institution and regulates its operations, responsibilities and powers. The main legal basis for occupational pensions is the **Occupational Pensions Act** (“Betriebsrentengesetz” BetrAVG). It governs the types of commitment, the forms of financing and the implementation of occupational pensions. Various supervisory arrangements also apply in part for different methods of implementation. Employee entitlements under occupational pension plans are protected by multi-level guarantee schemes, depending on the employers’ commitment and method of implementation. The **Retirement Funding Act** (“Altersvermögensgesetz” AVmG) supplements the Occupational Pensions Act. It introduces the possibility of establishing pension funds, grants the right to employees to request occupational

pension provision and implements taxation rules on retirement income. Pension insurance institutions (“Pensionskassen” and “Pensionsfonds”) are regulated under the **Insurance Supervision Act** (“Versicherungsaufsichtsgesetz” VAG). The law regulates the establishment, operation and supervision of insurance undertakings, “Pensionskassen” and “Pensionsfonds”. According to the IOPS country profile for Germany, the Insurance Contract Act (“Versicherungsvertragsgesetz” VVG) regulates the duties and rights of policyholders, insurers and insurance intermediaries in insurance contracts. This Act does not apply to pension funds. According to the Country Factsheet Report within the scope of the EU Commission study on drivers of investments in pension funds (EU 2019a), “Pensionskassen” und “Pensionsfonds” fall under the scope of the EU IORP Directive (Directive 2008/41/EC).

“Riester” pensions are based on annuity contracts of life insurance companies, on pay-out plans of banks and on fund contracts of capital investment and investment companies. Plans and contracts eligible to public subsidies must be approved and licensed. The certification body under the Retirement Provision Contracts Certification Act (“Altersvorsorgeverträge-Zertifizierungsgesetz”) is the Federal Central Tax Office (“Bundeszentralamt für Steuern”). It is responsible in particular for the certification of “Riester”-contracts and basic pension contracts (so-called “Rürup”-contracts).

Occupational pension schemes provided by “Pensionskassen” and “Pensionsfonds” are DB-plans. Members can choose between different types of DB plans depending on the investment risk. “Pensionskassen” and “Pensionsfonds” have one plan which is not exposed to investment risks and another one with a capital guarantee (EU 2019a, p. 1). According to the EU Commission's 2019 study on pension funds, around 170 institutional IORP providers of occupational pensions were active in Germany at the end of 2017.

“Riester” pensions are provided mostly by insurance companies, but also by banks or investment funds. While Riester pensions are voluntary, they are designed to fill the gap that will be created by the scheduled reduction of public pension benefits in response to the pressures of population aging. In order to achieve this goal, a comprehensive regime of saving incentives for certified pension products under the product label “Riester” pensions is institutionalized. Certifiable “Riester” pensions are subject to certain criteria (Börsch-Supan et al. 2012, p. 4). One of the requirements obliges providers to guarantee a positive investment return for each calendar year.

Investment regulations

In Germany, the investment regime for occupational pensions differs between the two main forms of pension providers. Investment restrictions may take the form of upper maximum limits with regard to certain assets classes, such as equities, real estate, bonds, forms of retail investment etc. In general, a more restrictive regime applies to “Pensionskassen”. According to a 2019 EU Commission Study on drivers of investments in pension funds (EU 2019b, p. 7), “Pensionskassen” are subject to a stricter and more restrictive regulation than “Pensionsfonds”.

As regards investment regulations for German “Pensionskassen” (OECD 2021b, p. 5) investment in equities are capped to 35% (of total exposure) for listed equities and to 15% for unlisted equities (see also OECD 2021b, Table 1, p. 21). These limits and no other equivalent restrictions apply to

pension funds (“Pensionsfonds”). Direct investment into real estate is restricted to a maximum share of 25% of total exposure for “Pensionskassen”. There is again no equivalent restriction for “Pensionsfonds”. As regards investment in retail investment funds no limits apply for both “Pensionskassen” and “Pensionsfonds”. For “Pensionskassen”, a limit of 50% applies to bills and bonds, regardless of whether they are issued by private sector companies or by the public administration. For “Pensionsfonds” investment in bills and bonds is unlimited. As regards investment into private investment funds “Pensionskassen” are limited to a maximum ceiling of 7.5% of total exposure. No limits apply to “Pensionsfonds”. In addition, “Pensionskassen” are subject to a 50% investment limit for loans and bank deposits. Again, no according restrictions and limitations apply to “Pensionsfonds”. The diversification of exposure is ensured by limitations of investment into single issuers. Again, a more restrictive regime applies to “Pensionskassen”. For instance, “Pensionskassen” are subject to investment limits on equity investment from a single issuer of up to 1% (EU 2019b). For “Pensionsfonds”, the corresponding limit is set at 5% (OECD 2021b, p. 203). For both “Pensionskassen” and “Pensionsfonds” no restrictions limit investments in foreign currencies.

Assets allocated

Assets in private and funded pension plans accumulated to EUR 287 billion in 2021, according to OECD Pension Markets in Focus publication 2022. This is equivalent to 8% of GDP. According to the IOPS country profile for Germany IORP-assets in “Pensionskassen” and “Pensionsfonds” were EUR 232 billion. Of 25 EU/OECD countries covered by OECD’s Pension Markets in Focus statistics, Germany has the 5th highest asset volume in absolute terms in private and funded pensions, following Netherlands, Denmark, Sweden and France.

The investment structure of assets and returns go hand in hand, as well as risk levels. Higher portfolio allocation to risky assets entails higher potential returns and higher return volatility. As regards the asset allocation of private and funded pensions in Germany bills and bonds are the most important form of investment. The share of assets invested in bills and bonds is 43.5%, compared to 7.6% of assets invested in equities and 2.5% invested in cash and deposits (OECD Pension Markets in Focus 2022, p. 31). According to Pension Markets in Focus assets classes distinguished from classical forms of investment is relatively important for Germany. Within the scope of the OECD publication the proportion of pension assets invested in loans, real estate (land and buildings), unallocated insurance contracts, private investment funds and other alternative investments is summarized in the category “other investment”. According to information from the EU Commission’s Study on the drivers of investments in equity from 2019 (EU Commission 2019yx, p. 4) the share of assets invested in real estate is rather low, at 3% of total invested assets.

Investment performance

In 2021, the real investment rate of return from funded and private pension plans was negative at 1.1%, according to OECD’s Pension Markets in Focus. For reasons of performance comparisons, a longer timespan is taken into account. Over the last 10 years, from 2012 to 2021, the average of real average annual rates of return for funded and private pension plans was 2.3% and thus

significantly above the comparative value for the last year. However, among 37 OECD countries compared, this corresponds to the 30th highest value. In the medium term, the performance of private and funded pension plans in Germany is therefore beneath average compared to other countries.

Tax treatment

In general, the taxation regime for funded pensions in Germany is in the form of an EET system (see Table 39 in section 2.14.3).

According to the EU commission study on drivers of investment into pension funds, pension plans provided by “**Pensionsfonds**” and “**Pensionskassen**” are both subject to an EET tax regime. Occupational pensions provided by “Pensionskassen” and “Pensionsfonds” are subject to the same taxation regime (IOPS country profile for Germany, IOPS 2019b, p. 3). Up to 8% of the maximum social insurance contribution **contributions** paid by employers and by employees into occupational pension plans are tax exempted. In 2022 the social security contribution ceiling was EUR 84.600 per year (OECD 2022b, p. 47). If total contributions exceed the limit, they are taxed at the individual’s marginal rate of income tax. As regards occupational pensions implemented in the form of **direct commitments**, contributions paid by employers and employees are tax free and no ceiling applies.

Corresponding to the 2nd “E” in the EET formula, **returns on investment** are exempted. Furthermore, no tax applies on pension funds accumulated and there is no ceiling on the lifetime value of private pension funds.

According to the EET formula, pension income from occupational pensions is generally taxed at the individual marginal rate of tax (OECD 2022b, p. 49). **Direct commitments** are in transition period regarding the taxation of pension income. The tax-free allowance on benefits will be gradually phased-out from 40% of pension income in 2005 to 0% by the year 2040. If the payment of the benefits starts in 2022, 14.4% of pension income is tax-free.

As regards pension funds, direct insurance and also “Riester” pensions, benefits from tax-deducted contributions are taxed at the individual’s marginal rate of income tax.

Table 9: Germany: Taxation regime for funded pensions

Taxation regime for funded pensions in Germany				
	Source of contribution	Contributions	Returns	Withdrawals
Occupational pensions (Pensionskassen and Pensionsfonds)	All (Employer and Employee)	E	E	T
Occupational pensions (direct insurance, direct commitment, support funds)	All (Employer and Employee)	E	E	T
Individual voluntary (Riester, Rürup)*	Individual	E	E	T
Private voluntary pension insurance	Individual	T	E	T/PE

* From 2005 onward the taxation of basic ("Rürup") pensions is transitioning from a partial EET regime to a full EET regime.

Quelle: OECD (2022). Annual survey on financial incentives for retirement savings. • Erstellt mit Datawrapper

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As regards individual pensions in the form of **"Riester" pensions**, members can receive a government subsidy. Insured individuals pay contributions net of those subsidies. Their gross contributions (including the subsidy) can be deducted from income tax (OECD 2022b, p. 48). Contributions to **basic pensions ("Rürup")** can be partially deducted from taxable income. From a tax perspective, basic pension plans are treated like mandatory state pensions (OECD 2022b, p. 48). These pensions are in a transition period regarding taxation: Starting from 60% in the year 2005, the tax exempted part is growing by 2 percentage points every year. In 2022, 94% of the contributions can be deducted from taxable income up to a certain ceiling. Contributions will be fully exempt from tax from 2025 up to a certain maximum amount.

As regards "Riester" pensions, benefits from tax-deducted contributions are taxed at the individual's marginal rate of income tax. If the annuity from a "Riester" contract is lower than EUR 32.9 in 2022 per month, the whole benefits can be paid as a lump sum. The lump sum is subject to a special tax rate and is added to taxable income. To avoid a one-off high tax burden due to the progressivity of income tax, lump sum payments from "Riester" pensions are treated as if the recipient received it evenly over the next five years. Programmed withdrawals with subsequent annuitisation (from the age of 85 years) from "Riester" plans are taxed at the individual's marginal tax rate. If the benefits of non-tax-deducted contributions, the latter is the case in the context of contributions exceeding tax limits, are paid as annuities, then only an age-dependent percentage of the pension is liable for taxation.

As regards **basic ("Rürup") pensions**, the taxation of pension income depends on the date of retirement. Until 2040 the taxation regime is in a transition phase, shifting from the taxation of contributions to the taxation of benefits. Basic pensions withdrawn in or after 2040 will be fully taxed. If the payment of the benefits started in 2005 or earlier, 50% of the benefits are subject to taxation at the marginal income tax rate of the pensioner. The taxable portion increases annually by 2 percentage points until 2020. Between 2020 and 2040, the taxable portion increases annually by 1 percentage point until reaching 100% in 2040. The tax-exempt part of the pension is determined by the rate applicable in the year of retirement. It is kept constant for the remaining

lifetime of the retiree. If the payment starts in 2022 the taxation rate of the pension is 82%. The annual amounts are taxed at the individual's marginal rate of income tax.

For mandatory individual pensions that are not tax favoured on the contribution side, some special tax rules regarding the benefits apply. For life-time annuities, only the so-called "income part", which corresponds to the returns on investment, is taxed at the individual's marginal rate of income tax. As regards lump sum payments from mandatory individual pensions that are not subject to the "Riester" or "Rürup" regime, the "income part" corresponds to the insurance benefit minus the paid-in contributions. If the lump sum is paid after holding a contract at least for 12 years and the recipient is 60 years or older half of the income part will be taxed. If the contract was signed from 2012, the payment must not occur before age 62.

2.5.5. Highlights and main features of the system

1. Strengths and weaknesses (according to Overall Pension Index – OPI)
<ul style="list-style-type: none"> - The German pension system shows medium results with regard to “Sustainability” (with an OPI score of 0.63 and ranked 6th among 11 countries) and “Adequacy” (OPI score 0.60, ranked 8th). - The system is characterized by a variety of PAYG- and funded elements, with the public PAYG system still dominating. However, funded occupational and individual plans becoming increasingly important due to tax promotion and public subsidization. By building up capital in funded elements of private and professional pension provision, reductions in benefit ratios are intended to be compensated for.
2. Tax treatment
<ul style="list-style-type: none"> - Funded 2nd tier occupational schemes („betriebliche Altersvorsorge“): EET; Funded 3rd tier personal schemes (“Riester” or “Rürup”): EET.
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - As regards 2nd tier occupational pensions contribution levels are often determined by collective agreements. Employees pay contribution in the form of earnings conversion (“Entgeltumwandlung”). Tax legislation allows contributions of up to 4% to be paid into German cash-balance plans. - As regards 3rd tier individual schemes contribution levels are determined in the pension contracts. “Riester” pension is tax-promoted and subsidised. The model assumes a contribution rate of 4%.
4. Asset Allocation
<ul style="list-style-type: none"> - In the year 2022 according to OECD: Equities (7.6%), Bills & Bonds (43.5%), Cash & Deposits (2.7%), Other* (46.2%) <p><small>* Assets invested in loans, real estate (land and buildings), unallocated insurance contracts, private investment funds and other alternative investments.</small></p>
5. Obligatory character
<ul style="list-style-type: none"> - Funded 2nd tier occupational pensions and 3rd tier individual plans are voluntary, but they are widespread and increasingly important, due to tax-promotion and public subsidization. Occupational plans are often laid down in collective agreements. - 3rd tier individual pensions are voluntary, but tax-promoted and subsidized.
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - The accrued capital is either paid out in the form of a lifetime annuity or as a one-time lump-sum. Pension capital from pension funds (“Pensionsfonds”) can only be paid-out in the form of lifelong annuities or according to a payment plan respectively (Schneider et al. 2021, p. 196).
7. Contributions to funded plans as percentage of GDP
<ul style="list-style-type: none"> - According to OECD Pension Markets in Focus 2022 (OECD 2023) the volume of contributions to all forms of funded schemes was only 0.4% of GDP in 2021.
8. Investment performance
<ul style="list-style-type: none"> - 10-year average investment rate of return 2011-2021 according to OECD: 2.3% - At the same time the OECD average was 3.7%.

Additional information and results

- The statutory public pension system provides for earnings-related benefits. It fulfils 2nd tier functionalities. In contrast, the guarantee of a minimum pension is not a main task of the statutory pension scheme. Functionalities of 1st tier pensions are achieved through social assistance measures.
- The public pension scheme is based on PAYG financing. Pension entitlements are calculated according to the equivalence principle. Higher earned income is transferred into higher pension benefits.
- The 2nd tier comprises funded occupational pension schemes. Although these are not mandatory, they are laid down in many company and collective agreements. Employees can demand the implementation of an occupational old-age pension scheme from their employer. The 3rd tier pensions are made up of funded individual pension plans.
- Germany will be affected by demographic ageing to a large extent by 2040. Without legislative measures to strengthen the sustainability of statutory pensions, fiscal pressure would increase very significantly. The decline in the benefit ratios of the statutory pension insurance is compensated by capital accumulation and the increasing coverage of funded pension schemes in the 2nd and 3rd tier.

2.6. Denmark

2.6.1. Demographic profile and demographic forecast

Denmark's population will increase slightly from around 5.8 million in 2019 to 6.2 million in 2070, according to the European Commission's projections (Table 10). This is partly explained by a slowdown in immigration rates. In terms of composition, as in other Member States, the old-age dependency ratio (population 65+/population 20-64) is projected to increase from 34.1% in 2019 to 53.8% in 2070. Similarly, the ratio of the population aged over 80 to the population aged 65+ (ageing of the aged indicator) will increase from 23.4% to 39.3% in the long term, reflecting the change in life expectancy and thus the demographic trend towards an older population. Life expectancy for both men and women will have risen dramatically by 2070, to around 86 years at birth for men and 90 years at birth for women. The same applies to life expectancy at the age of 65 for both men and women, with an increase of about 5 years. In addition, the survival rate for both men and women will reach very high levels in 2070, with almost 95% of both men and women surviving to the age of 65. Regarding the survival rate for individuals aged 80 and above, about 80% of men and almost 88% of women are expected to survive that age (EU, 2020g)

Table 10: Denmark: demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (1,000 persons)	5,809	5,970	6,058	6,100	6,124	6,156	5,809 → 6,156
Population growth rate	0.3	0.2	0.1	0.1	0.0	0.1	0.3 → 0.1
Old-age dependency ratio (pop 65+ / pop 20-64)	34.1	41.4	47.4	47.9	51.2	53.8	34.1 → 53.8
Old-age dependency ratio (pop 75+ / pop 20-74)	12.5	17.5	20.7	23.7	23.8	26.1	12.5 → 26.1
Ageing of the aged (pop 80+ / pop 65+)	23.4	31.5	32.9	38.9	39.5	39.3	23.4 → 39.3
Men - Life expectancy at birth	79.5	81.0	82.4	83.7	84.9	86.1	79.5 → 86.1
Women - Life expectancy at birth	83.3	84.8	86.2	87.5	88.7	89.8	83.3 → 89.8
Men - Life expectancy at 65	18.5	19.5	20.5	21.5	22.4	23.3	18.5 → 23.3
Men - Life expectancy at 60	22.4	23.6	24.7	25.8	26.8	27.7	22.4 → 27.7
Women - Life expectancy at 65	21.1	22.2	23.3	24.4	25.3	26.3	21.1 → 26.3
Women - Life expectancy at 60	25.3	26.7	27.8	28.9	29.9	30.9	25.3 → 30.9
Men - Survivor rate at 65+	87.0	89.1	90.7	92.1	93.2	94.2	87 → 94.2
Women - Survivor rate at 65+	91.8	93.2	94.2	95.1	95.8	96.5	91.8 → 96.5
Men - Survivor rate at 80+	58.8	64.4	68.9	73.0	76.6	79.7	58.8 → 79.7
Women - Survivor rate at 80+	71.0	75.7	79.4	82.6	85.3	87.6	71 → 87.6
Net migration (thousand)	-1.6	12.4	12.5	11.3	11.0	11.0	-1.6 → 11
Net migration over population change	-0.1	0.9	2.1	3.6	5.1	2.6	-0.1 → 2.6

Source: European Commission • Created with Datawrapper

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Though net migration is subjected to be positive throughout the entire period of interest, it will slightly fall over time to 11 thousand in 2070.

Referring to the projected exit ages, it can be observed that increasing exit ages for both men and women will reflect the increases in life expectancy. That is why the percentage of adult life

spent in retirement will virtually stay the same over the period with 28% and 22% for men and women respectively. Nonetheless, early exit opportunities seem to become more likely, as the ratio of early exits to late exits for both men and women is increasing. For men, the increase is quite drastic from 0.8 to 6.5 compared to women, which start at a ratio of 2.9 and end up at the same level as men (Table 11).

Table 11: Denmark: exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labour market exit age (CSM) - Men	65.0	66.1	67.2	68.0	69.0	69.5	65.0 → 69.5
Duration of retirement - Men	18.4	18.7	18.9	19.0	19.0	19.8	18.4 → 19.8
Percentage of adult life spent in retirement - Men	28.1	28.0	27.8	27.5	27.1	27.8	28.1 → 27.8
Early/late exit - Men	0.8	2.0	2.7	4.3	4.8	6.5	0.8 → 6.5
Average labour market exit age (CSM) - Women	64.1	65.5	66.7	67.6	68.5	69.2	64.1 → 69.2
Duration of retirement - Women	21.9	21.4	21.6	21.7	22.6	22.6	21.9 → 22.6
Percentage of adult life spent in retirement - Women	32.2	31.0	30.7	30.4	30.9	30.6	32.2 → 30.6
Early/late exit - Women	2.9	2.4	3.7	4.9	6.1	6.5	2.9 → 6.5

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

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The role of migration

For Denmark, migration will be relevant for the sustainability of the pension system, though its influence might be limited (Figure 26). For the forecast period of 2022 to 2060, the population share aged 20-64 will remain virtually the same in the scenario with migration. In contrast without migration, a difference of 391.000 individuals is estimated in 2060, which equates to 13.5% of the working-age population in 2060. Regarding the population aged 65+, the discrepancy for the two scenarios is negligible as they differ by about 60.000 individuals. With and without migration, this latter population share increases till 2060.

Nevertheless, this difference in working-age population due to immigration has an effect, though only marginally, on the old-age dependency ratio (Figure 27). The scenario with migration shows a ratio of 51, while for the scenario without migration, it is 55.

To keep the old-age dependency ratio of 35.3 in 2022 constant, net migration or the return of expatriates of 1.6 million individuals would be required. The forecasted working age population in 2060 without migration is projected to be 2.9 million. To keep the old-age dependency ratio constant, a working age population of 4.55 million would be required, the difference of 1.6 million represents the necessity for net migration or returning expatriates. This implies an annual average migration of approximately 43.000 individuals per year.

Figure 26: Denmark: demographic forecast with and without migration (2022-2060)

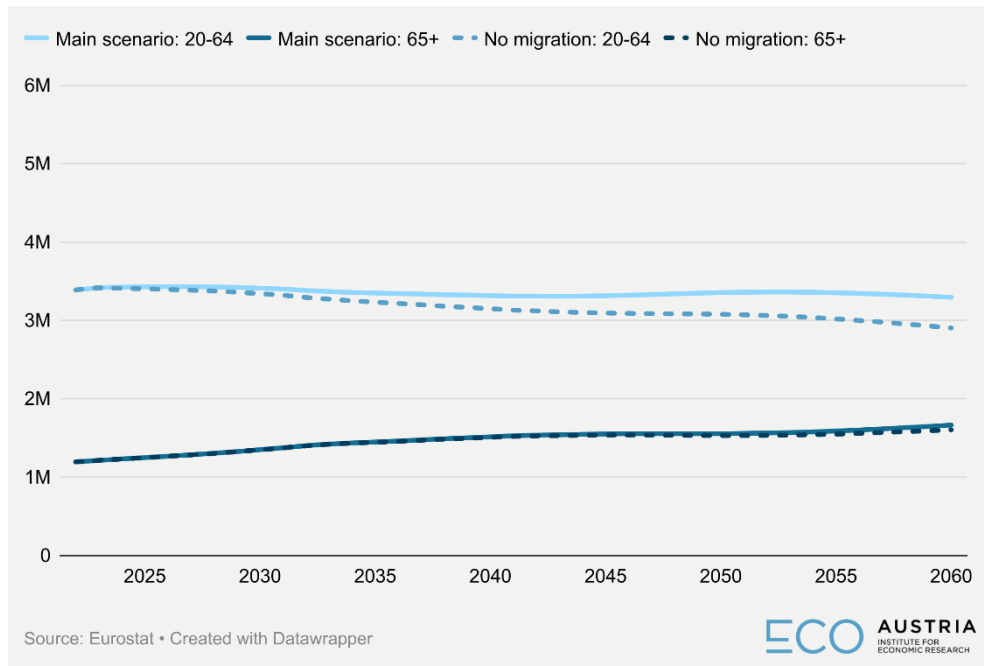
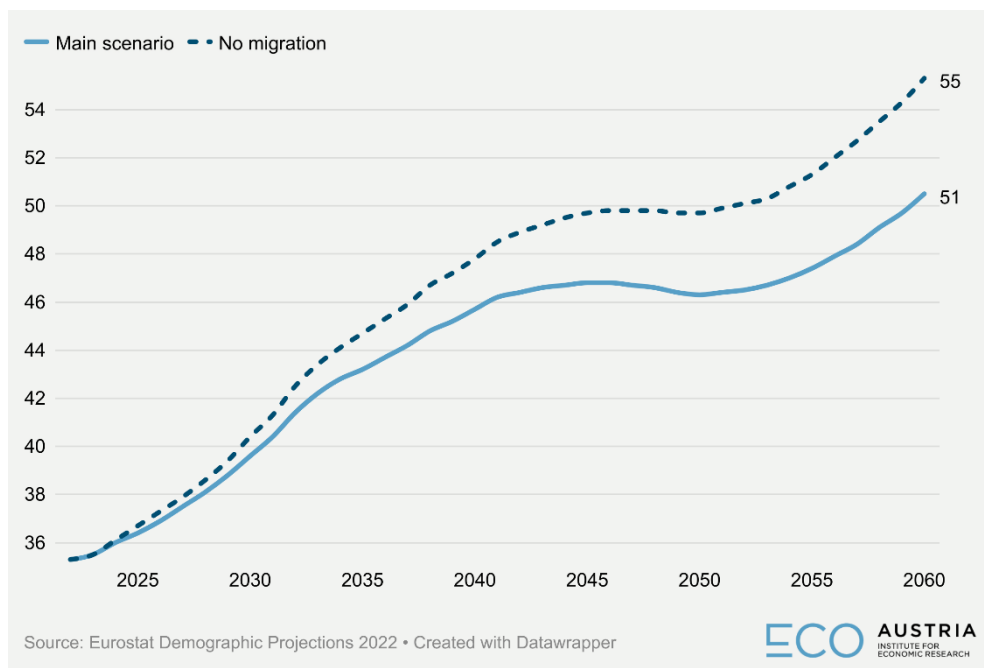


Figure 27: Denmark: old-age dependency ratio (65+/20-64) in the main scenario and without migration



2.6.2. General architecture

In Denmark, the pension system is based on three tiers, the first tier features several governmental components (EU, 2020g; Schneider, Petrova & Becker, 2021):

- The base of the **first tier** is comprised of the “old-age pension” (Folkepension) and the voluntary early retirement pension (Tildlig Pension), which combined represents the

universal tax-financed, defined benefit PAYG-system. Even though early retirement is voluntary, the voluntary early retirement pension (VERP) often gets accounted to the first tier, as it is state-controlled, nonetheless, it is an individual pension scheme.

- In addition, almost all individuals in Denmark are subject to the supplementary pension “ATP” (Arbejdsmarkedets Tillægspension), which is a funded defined contributions system for wage earners. The contributions made to the members’ funds are invested by ATP itself. This pension scheme is the first and basic component of **the second tier** of the Danish pension system. For recipients of social benefits, the state provides the obligatory pension system (Obligatorisk Pensionsordning) which replaces payments in the supplementary pension ATP for these individuals.
- In addition to the basic ATP scheme, the **second tier** consists of privately organized contribution-based labour market pensions. Within those occupational schemes, there is a mix between PAYG and funded systems. The second tier also features tax-financed, income-related civil servant pensions.
- The **third tier** is based on voluntary individual private pension plans. These pension plans are typically lump-sum or instalment pension schemes, but they also include life annuities.

Qualifying conditions

As of 2023, the retirement age in Denmark is 67 for the old-age and the supplementary pension system. Eligibility for the old-age pension system is tied to the duration of residency in Denmark, while the early retirement pension is based on long-term contributions on the labour market. There are differences in residency requirements for Danish nationals and non-EU foreigners. The minimum requirement to receive the old-age pensions for Danish nationals is three years of residency within working-age, while for non-EU foreigners, this residency requirement is ten years, of which five must be immediately before retirement. To receive the full pension, individuals reaching the retirement age before 01.08.2025 had to be residents for 40 years during their working age. For individuals reaching the retirement age later than that, the full entitlement is bound to nine out of ten years of residence in Denmark (MISSOC²²).

For the supplementary pension system, all employees aged 16+, working 9+ weekly hours, are compulsorily insured. In addition, individuals participating in employment promotion or education training measures, as well as recipients of certain social benefits, are also compulsorily included. Self-employed individuals are allowed to voluntarily contribute, given that they have been a member for the preceding three years. For employees, there are no minimum duration requirements.

Current and future retirement age

As mentioned, the retirement age is 67 in 2023. The retirement age is adjusted on a 5-year-basis and is meant to be increased to 69 in 2035 by steps. With the “Welfare Agreement”

²² MISSOC refers to the “Mutual Information System on Social Protection). It contains information on various social protection systems of the 27 Member states of the European Union and the EEA. Data can be found at the [Weblink](#).

(Velfærdsforliget) of 2006 and the retirement reform of 2011, an indexation mechanism for the retirement age has been introduced, so that the retirement age is now based on life expectancy of 60-year-olds, effectively linking the retirement age to life-expectancy. In addition, the possibility for voluntary early retirement (VERP) has been reduced to three instead of five years before the statutory retirement age. Considering age projections for Denmark, the retirement age is subjected to increase by nine and a half years to 75 years in 2070. Analogously, the postponing of retirement in Denmark is also possible up to ten years, where the pension benefits are then increased based on a percentage calculated with the duration of deferring as well as the average life expectancy at the end of deferment.

First-tier pensions

The public pension scheme can be divided into the basic amount and the pension supplement. The basic amount as of 2019 is DKK 75,800 or EUR 10,000 annually, which roughly equals 18% of average earnings. If the pensioner has earned income over the threshold of DKK 336,900 or EUR 45,200 annually, 30% of the income above the threshold is deducted from the basic pension. If the individual exceeded the annually earned income threshold of DKK 583,000 or EUR 78,300, the basic pension amount is completely phased out.

Regarding the pension supplement, the amount differs for single pensioners and married/cohabitating pensioners. The amount of DKK 85,500 or EUR 11,500 annually (in 2019) gets split in half. Similar to the basic amount, the pension supplement gets reduced with certain income thresholds. The supplement is reduced by a 16-31% rate above the threshold, which includes earned and capital income, as well as benefits from occupational and private pension schemes. Lastly, the rate of deduction and thresholds depend on marital status and if the spouse is also a pensioner.

To reduce old-age poverty, the Danish Government targets eligible pensioners with the supplementary pension benefit. The amount in 2019 was DKK 17,600 or EUR 2,360. To receive the full benefit, individuals must not hold more than DKK 89,900 or EUR 12,000 in liquid wealth, as well as the supplementary pension is reduced, if income apart from the old-age pension exceeds DKK 35,800 or EUR 4,800 for singles and DKK 71,000 or EUR 9,500 for couples respectively (EU, 2020g).

Second-tier pensions

Additionally, the “Labour Market Supplementary Pension Scheme” (ATP) also comes close to absolute universality, as it covers almost all wage earners and recipients of social benefits. Self-employed persons are not automatically included in the ATP scheme but can participate and contribute voluntarily. It is a fully funded, defined contribution, collective insurance-based scheme, which as mentioned before, is compulsory for employees²³. Contributions are split between employee and employer, with the amount for a full-time worker being equal to DKK 189 or EUR

²³ Due to its hybrid character, it is hard to distinctly assign the ATP scheme to one of the three tiers. Danish authorities tend to associate the ATP scheme to the first tier, due to its quasi-universal, publicly organized and mandatory character. However, in this study, the ATP scheme is attributed to the second tier because it does not universally cover all residents. Furthermore, it represents an occupational job-related scheme and it is not financed on a PAYG basis.

25 for the employer and DKK 95 or EUR 13 for the employee per month. Thus, the contributions are not defined by income, but by hours worked, i.e., the amount varies with hours worked.

In technical terms, the pension scheme of the ATP represents a guaranteed deferred annuity without any intergenerational transfer component, as each generation finances their own pension right on a what-you-pay-is-what-you-get basis. Hence, the benefits paid depend on the length of the individual's contribution level and employment rate over time. 80% of paid ATP contributions are used to buy new individual pension rights. ATP pension benefits are based on a discount rate that is adjusted to the long-term hedgeable interest rate that is available in the market at the time of acquisition. That is why the discount rate of the ATP differs each year, as well as why pension provisions are sensitive to changes in the market interest rates. The remaining 20% of contributions are used as investment buffers and for the financing of longevity increasing measures (EU, 2020g).

More specifically, ATP's total funds are divided into two portfolios, one being the hedge fund and the other one being the investment fund. As mentioned before, roughly 80% of contributions are used to fulfil guaranteed pension benefits, which is done through the hedging portfolio. Thus, the hedging portfolio is intended to just provide the nominal guaranteed pension payments. The investment strategy of the portfolio is focused on long-term stable investment and therefore includes long-term bonds and interest swaps. Furthermore, the hedging portfolio of ATP follows a "full hedging" approach to almost eliminate the interest rate risk. In turn, this allows the investment portfolio, on the other hand, the highest possible capability to assume other types of market risks, that may allow for higher risk premiums. The investment portfolio, which makes up roughly 20% of the ATP funds, is meant to generate higher returns in order to build reserves used to balance out cost related to, e.g., ageing and increased life expectancy. This approach is intended to maintain the real value of the pension besides the nominal guaranteed pension provision, given by the hedging portfolio (ATP, 2021)

The ATP scheme has imposed a risk management strategy which balances out total risk through the "bonus potential". The latter is defined as the difference between the ATP's assets and its guarantees, therefore constituting ATP's reserves. The risk budget²⁴ has been set to equal only half of the bonus potential, in order to guarantee for the nominal pension benefits at all times. This also allows for a dynamic risk adjustment, meaning, that the investment portfolio risk level can be increased, if the bonus potential grows. It should be added that the risk for both portfolios is measured with a rather short-term 3-month horizon²⁵. The investment portfolio additionally follows a factor approach in order to diversify risk (ATP, 2021).

Even though the two ATP portfolios are separated, it does not imply that the funds of each portfolio are tied to one or the other. By using financial instruments, such as derivatives, the investment portfolio can invest funds from the hedging portfolio, which therefore gives access to more capital/liquidity. This allows for higher investments by the investment portfolio than the bonus potential, which may yield higher returns compared to the case, where only the bonus potential is

²⁴ Risk budget here refers to the allocated risks to the investments within the portfolio.

²⁵ Risk consumption is measured using the Expected Shortfall methodology, focusing on the one percent greatest losses in various market scenarios, thus accounting for extreme events with the most significant losses.

used. All investments, including alternative illiquid investments, are assessed with the same four factors regarding risk, these being the equity and interest rate and inflation factors and a residual category of other risks. As mentioned, ATP also invests in less traditional, alternative asset classes, which include private equity, infrastructure, real estate and certain types of credit (ATP, 2021).

In 2019, the total savings in the ATP scheme were equal to 38% of GDP, while benefits from the same year were equal to 0.8% of GDP.

2.6.3. PAYG and fiscal challenges

Public Expenditure

In 2019, spending on the old-age pension was equal to 6.3% of GDP, while at the same time, benefits paid out by the ATP were equal to 0.8% of GDP. In total, public expenditure on pensions was 8% of GDP in 2017, which amounts to roughly 16% of government spending, which is slightly lower than the OECD average. Nevertheless, it is projected that public pension expenditures in total will decrease from 9.3% of GDP to 7.9% of GDP in 2070 again, which can be explained by the stepwise increase of the statutory old-age pension age, as this will hold the ratio of old-age pensioners to employment almost constant. It is also assumed that after 2020, productivity per worker will grow stronger than wages, which lowers expenditures as a share of GDP (EU, 2020g).

When it comes to old-age poverty, indicators from 2018 reveal low poverty rates in Denmark compared to other OECD countries. It is especially worth mentioning that the poverty rate of the total population with 6.1% is higher than the one for the population aged 65+ with 3.0%. Poverty in this particular context was defined as the percentage of the population with less than 50% of the median equivalized household disposable income. Nonetheless, there are heterogeneities observable when it comes to the old-age poverty rate. For once, the rate for individuals aged 75+ is higher with 4.5% than for the cohort of individuals aged between 66 and 75 with 2.0%. When it comes to men and women, women are more prone to experience old-age poverty with a share of 3.7% compared to men with 2.2% (OECD, 2021).

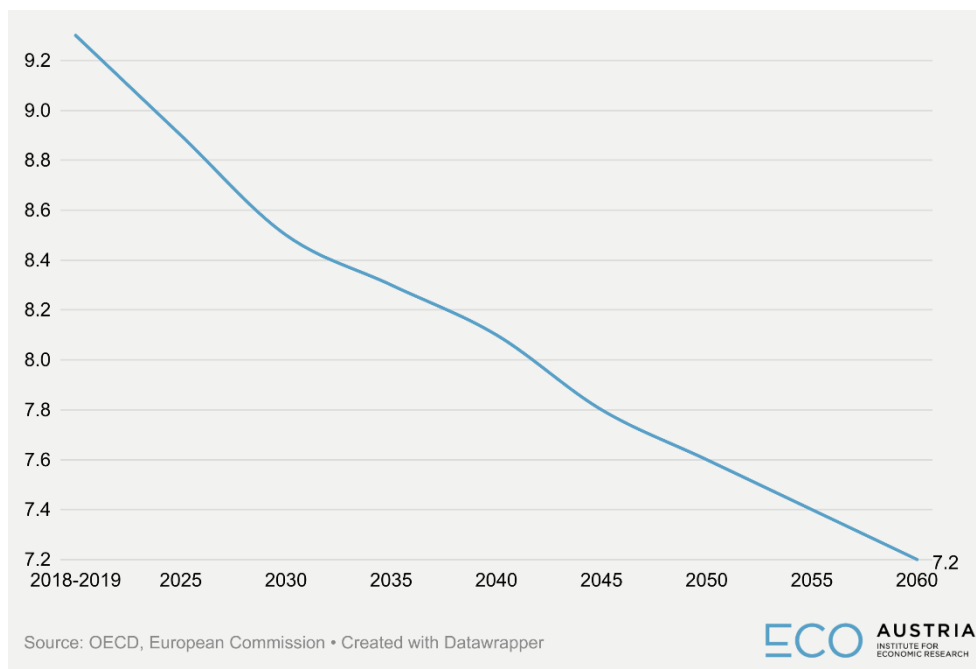
Yet, when it comes to the replacement rate, no discrepancy between men and women can be observed, with the net replacement rate in 2020 being 84% for both. Regarding net pension wealth, i.e., present value of the flow of pension benefits taking into account taxation, indexation, life expectancy and retirement age, Denmark is equal to the OECD average with net pension wealth being a 11.4 multiple of annual gross earnings. However, in terms of pension assets, Denmark is one of the frontrunners in the European Union, with pension fund assets equaling approximately 50% of GDP in 2021 and the absolute value of private pension assets being the second highest with \$ 889 billion in 2021 (OECD, 2023c)

Forecast of public expenditure

As mentioned above, the public expenditure on pensions as a share of GDP is projected to slightly but constantly decrease over the projection timeframe (Figure 28). There are several reasons that explain this trend. Besides the indexation of retirement age, in the 2012 tax reform, it was also

agreed to index pension benefits to wages. The rate adjustment percentage is based on the wage development of the fiscal year two years prior. Hence, benefit adjustment is lagged in regard to the wage development. Notwithstanding, it was also agreed on that the old-age pension should be exempted, therefore this factor only applies to, e.g., the voluntary early retirement pension and the disability pension. This indexation of benefits leads to lower indexation in the first couple of years than wages.

Figure 28: Denmark: Forecast of public expenditure on pensions (in % of GDP)



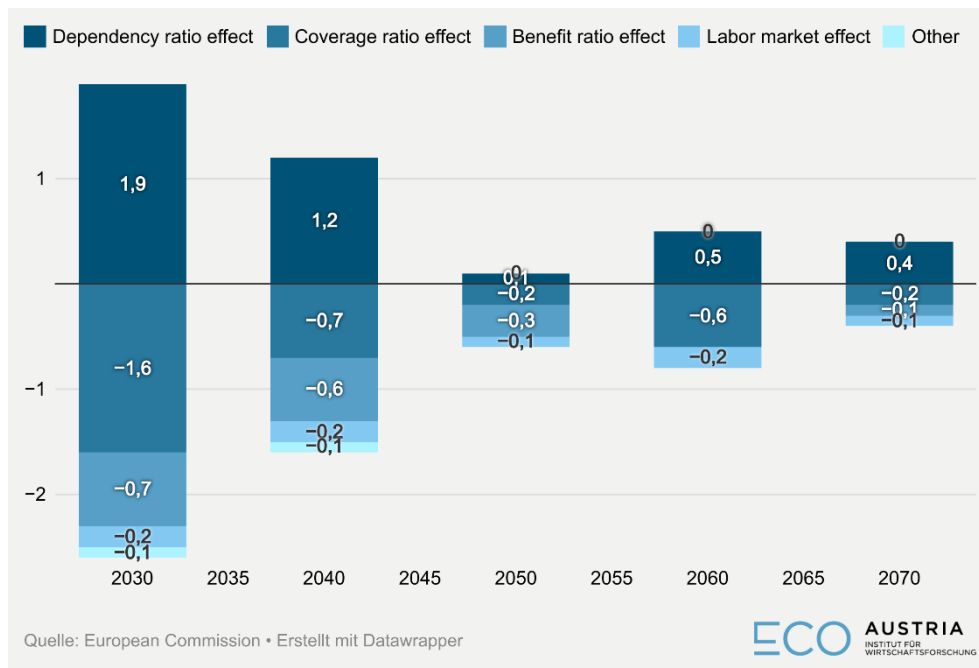
Furthermore, there will be compositional changes in coverage. It is reported that by the end of the forecast period, the share of people receiving old-age pension will have increased compared to the share of people receiving higher-benefit pensions like the voluntary early retirement pension and the civil servant pension.

The aforementioned dependency-ratio effects also play a crucial role as a driving force for the public pension expenditure projection. The number of pensioners until 2070 is forecasted to be 1.3 million, yet employment also increases during the whole period. Up until 2060, this leads to a decline in the dependency ratio, from 2060 onwards, the employment is ought to increase less strongly, hence the reoccurring growth in the dependency ratio (Figure 29). This also links to the coverage ratio effect, as through the indexation of the retirement age, the coverage during the projection period slightly decreases, contributing to the effects on expenditure. It must be mentioned that 90% of employees in Denmark contribute to occupational as well as private schemes. As these are focused on cohorts instead of individuals and their respective contributions, wealth and benefits, calculating coverage ratios for the circumstances of these regimes is suboptimal (EU, 2020g).

Nonetheless, considering occupational/private schemes is essential in this context, as benefits paid out of these schemes grow until 2070. For private schemes, this share increases from 4.8%

of GDP in 2019 to 6.0% of GDP in 2070. This increase is crucial in explaining, how public pension expenditure declines over time without any losses in benefit-ratio. The compound benefit ratio increases from 60% in 2016 to 64% in 2070, even though the ratio for the basic public pension decreases from 42% to 34% and the old-age pension ratio stays constant. It is due to the maturation induced increase of the occupational pension benefit ratio, which rises from 23% to 38%. This offset within the total benefit ratio can be seen in its contribution to the decrease in the public pension expenditure (Figure 29).

Figure 29: Denmark: Components of change in the public expenditure



Forecast of replacement rates

When it comes to the benefit ratio (both overall and earnings related) and the earnings-related replacement rate, two different pathways can be observed. While the overall benefit ratio declines 7.0 percentage points and the earnings-related benefit ratio by 9.0 percentage points over the projection period, the earnings-related replacement rate remains virtually the same with very little fluctuation (Table 12). The benefit ratio describes the ratio of the average expenditure/average income from pensions per pensioner to the average wage in the economy. The decline in benefit ratios, which here only relate to the public schemes, can be explained by the previously mentioned reasons for the decline in public pension expenditure. If the expenditure on pensioners declines and the average wage remains the same or increases, the benefit ratio decreases. In contrast, the replacement rate relates pension benefits to the pre-retirement income. The replacement rate displayed in Table 12 represents the total replacement rate, meaning that it includes benefits received from second tier schemes, which leads to these higher, less fluctuating rates. Considering the previous claims on pension reforms and that the Government of Denmark is trying to shift from heavy public first tier scheme more to occupational and private schemes, one

can explain how the replacement rate remains virtually constant. Declines in public pension benefits will be substituted by benefits from the other tiers (EU, 2020g).

Table 12: Denmark: Benefit ratios and replacement rate until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Overall benefit ratio	43%	41%	38%	37%	36%	36%	-7.0
Earnings-related benefit ratio	41%	38%	35%	33%	33%	32%	-9.0
Earnings-related replacement rate	57%	56%	57%	57%	57%	58%	1.0

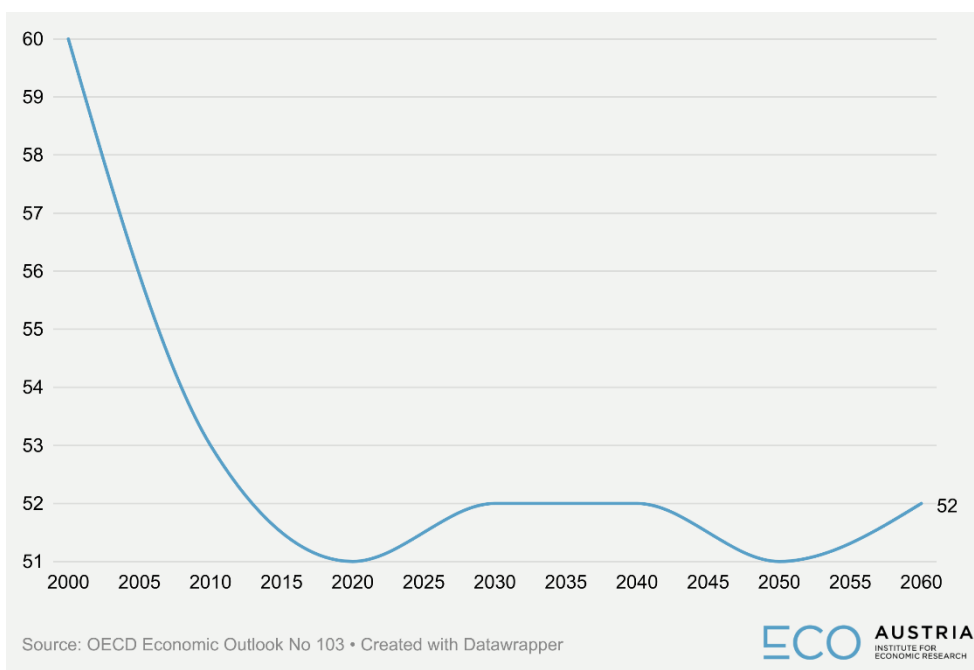
Source: European Commission • Created with Datawrapper

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Forecast of debt levels

The steady decrease in public expenditure on pensions will aid Denmark to keep its debt level constant over the projection period. While gross long-term liabilities made up about 60% of GDP in 2000, in 2020, this level was already reduced to 51%. For the forecast period, Denmark is projected to be able to hold this debt-to-GDP level at around 52% till 2060 (Figure 30).

Figure 30: Denmark: Projection of long-term gross financial liabilities (in % of GDP)



This projection of the debt level can be partially explained both by a rather neutral (not favorable nor unfavorable) initial fiscal position as well as by neutral long-term projections. For this reason, the European commission assigned Denmark a very low S2 indicator value between 0 to 2, meaning that its financial sustainability gap is low. This indicator signifies the long-term fiscal adjustment needed to be made in order to stabilize debt-to-GDP. On the other hand, the S1 indicator represents a more medium-term view, as it indicates the necessity for fiscal measures to reach the Maastricht debt requirement of 60% by 2032. As Denmark's S1 indicator value ranks

below zero, the fiscal risk can be considered as low. Positive contributors to this value of approximately -3.5 percentage points of GDP are the negative debt requirements, the initial fiscal/budgetary position and to a lesser degree the pension system (European Commission, 2017).

2.6.4. Funded Pensions (Second and third tier)

Voluntary/Mandatory, Occupational/Personal, Book reserves

As mentioned before, second and third tier pensions schemes play a substantial role in providing adequate replacement rates to pensioners. In this analysis, the ATP scheme was assigned to the second pillar, although it is close to absolute universality. However, beside the ATP scheme, there are yet other fully funded, defined contribution, occupational schemes, which are agreed on by the social partners in collective agreements.

More than 90% of employees pay into occupational schemes other than ATP. Coverage of these schemes has increased drastically since their introduction to the private labor market in the 1990s. Before 1995, the coverage was even lower than 70%. This increase in coverage has made occupational schemes a more relevant component in the Danish overall pension system. While contributions amounted to 1.3% of GDP in 1980 (2.3% including private contributions), they grew to 5.3% in 2018 (6.0% including private scheme contributions). The total savings of these occupational schemes are substantial, they equaled to 120% of GDP in 2019. Furthermore, the occupational schemes are negotiated on the industry/branch level and the increasing inclusion of blue-collar-workers since the mid-1980s can be seen as one of the main reasons for the growing importance of 2nd tier occupational pensions. Similar to the ATP scheme, private occupational pension funds in Denmark are focused on investing in diverse asset classes, including the same alternative investments, that were mentioned above. This in turn leads to risk diversification and potentially higher returns. The contribution rate, which is set in wage agreements, is typically around 10 – 17%, at least 60% of contributions fall within these rates. Regarding the specific types of benefits within this tier, there is great variation. Most typically, life-long annuities are provided, topped up with a rate pension that is paid out over 10 – 25 years. But it is also common to receive a capital pension paid out as a lump-sum benefit. Benefits of these second-tier schemes equaled 5.3% of GDP in 2019.

When it comes to the third tier (private voluntary pensions), the typical schemes are reversed compared to the occupational schemes. For the individual, private pension savings plans, capital and rate pensions are the most common, while life-long pensions are possible but not as common. As these schemes are privately initiated with banks, insurance companies and pension funds and due to the independence of employment conditions of these individual schemes, the flexibility in terms of contribution size and benefit composition is considerably higher, as the individuals are free to choose. The total savings from this tier made up 29% of GDP in 2019.

Investment regulations

Pension funds regulation is done by the Danish Financial Supervisory Authority (Finanstilsynet), while the specific regulatory frameworks for pension funds are set in place by the European Union,

Solvency II and IORP II apply, which both implement the Prudent Person principle (PPP). These two regulatory frameworks are the only limitations regarding asset classes for large and small pension funds, as well as life insurance pension providers. Only for pension savings in banks, there are limitations on real estate and loans. Limits for pension funds in banks and small pension fund companies additionally apply, if investment is allocated to a single issuer. Regarding small pension fund companies, this is also important for equity and bonds issued by the private sector, while for pension savings in banks, this additionally includes private investment funds. For foreign asset classes, only the Prudent Person Principle applies. Furthermore, for company pension funds, there is limitation on which ancillary activities can be performed, other financial activities must be done through subsidiaries. Company pension funds are also required to implement a minimum of 80% currency matching, while for Euro, a match up to 50% of other currencies is allowed (OECD, 2021b)

Assets allocated

Alternative investments play an important role in Denmark regarding the asset allocation of pension funds. In 2021, 42.5% of assets allocated fell within this category. It includes several forms of investments, e.g. loans, real estate, unallocated insurance contracts, private investment funds and other forms of alternative investments. The share of alternative investments in Denmark is one of the highest among OECD countries. For most other countries, this category only plays a minor role. Between 2010 and 2020, the share of alternative investments as pension assets has grown from 13.6% to 15.6% within the OECD. It is argued that the occurrence of this trend is driven by the necessity of pension providers to generate higher yields in order to meet obligations to pensioners (OECD, 2023). Looking at the proportion of alternative investments within Denmark's pension asset structure, it must be highlighted, that Denmark is already ahead of this development compared to the rest of the OECD, i.e., Danish pension providers are more strongly focused on alternative investments. In general, this should not be seen as problematic, as the shift towards alternative investments does not necessarily lead to increased risk profile in pension portfolios. When it comes to investment in pension assets abroad, Denmark is situated in the middle field of OECD countries, with that indicator roughly equating to 40% of GDP of total investment.

Investment performance

Investment performance of funded and private pension plans in Denmark has declined in the last years, but has remained comparatively high in international comparison. While the nominal investment rate of return in 2019 was 10.9% (real: 10.1) it decreased slightly to 9.2% (real: 8.7) in 2020 and then dropped to a low of 6.3% (in real terms 3.1%) in 2021, due to rising inflation. Nonetheless, there are no negative returns in this period, despite financial shocks, which can be observed in several OECD countries. In addition, the real geometric average annual investment rate of return is quite stable considering the last 10 to 20 years. Denmark had one of the strongest average annual investment rates in the last 10 years with 4.6%, with the 20-year average being virtually the same.

Tax treatment

The first tier of pensions being the public pensions, e.g., old-age and voluntary early retirement, are taxed with the progressive personal income tax, which ranges from 8 to 40% in Denmark, however, public pensions are not subject to the 8% payroll tax.

Opposed to the taxation of the first pillar, the second and third pillar are mostly taxed with the ETT rule, i.e., contributions are exempted, while returns and benefits are taxed. Conversely, even though contributions to occupational and private schemes are also taxed with the 8% payroll tax, they can be used as income tax deductions at the time of contribution. Looking at the pension types, life-long and rate pensions are subject to the personal income tax, but not the payroll tax at the moment of the benefit pay-out. In contrast, capital pensions are taxed at 40% regardless, so there is a flat tax on these schemes. It is expected that tax revenues are going to increase due to increased pension payments, as well as the underestimation of the fiscal sustainability, which stems from the time discrepancy between tax write-off contributions and then later taxed benefits. Interestingly, since the 2012 tax reform, capital pensions are the only pension scheme which do not follow the ETT taxation anymore. Instead, benefits are exempted from taxation, while contributions are now taxed (TTE).

2.6.5. Highlights and main features of the system

1. Strengths and weaknesses (according to the Overall Pension Index – OPI)
<ul style="list-style-type: none"> - The Danish pension system ranks top with regard to financial “Sustainability” (with an OPI score of 0.85 and ranked 3rd among 11 countries compared), with regard to “Adequacy” (OPI score 0.80, ranked 2nd) and to “Market capitalization” (OPI score 0.98, ranked 1st) - The Danish Pension is defined by a multitude and diversity of components, including fully-funded pensions, which altogether lead to a low fiscal risk and high total replacement rates for Danish pensioners. As a result, the volume of funded pension assets in Denmark is high.
2. Tax treatment
<ul style="list-style-type: none"> - 1st tier: TTE; 2nd and 3rd tier: ETT.
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - ATP: €25 are covered by the employer and €13 by the employee per month (for full-time employee) - Occupational: 10-17%, 2/3 by employer and 1/3 by employee
4. Asset Allocation
<ul style="list-style-type: none"> - Equities (25.8%), Bills & Bonds (26.0%), Cash & Deposits (1.5%), CIS26 (2,5%), Other (44,2%)
5. Obligatory character
<ul style="list-style-type: none"> - ATP is quasi-mandatory, covering all wage-earners and almost all individuals receiving social benefits, self-employed individuals can contribute voluntarily - 90% of employees are covered by occupational, regulated in collective agreements
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - Life-long, rate and capital pensions are all available - For the 2nd tier, life-long annuities in combination with a rate pension are the most common, yet capital lump-sum pension are also not uncommon - Capital and rate pensions are the most common for the 3rd tier, life-long annuities are nonetheless also possible - Generally possible to designate a beneficiary in the event of early passing
7. Contribution to funded plans as percentage of GDP
<ul style="list-style-type: none"> - Total contributions to funded systems were equal to 9% of GDP in 2021 (or latest year available)
8. Investment performance
<ul style="list-style-type: none"> - 10-year average investment rate of return 2011-2021: 5.0%. - At the same time the OECD average was 3.7%.

²⁶ Collective investment schemes (when look-through is not available)

Additional information and results

- The public expenditure on pensions is subjected to decrease in the projection period, even though the total replacement rate remains constant, which is partly due to shifts towards occupational and private schemes.
- The pension system is indexed in two ways. On one hand, the retirement age is regularly adjusted based on the life expectancy at retirement. Secondly, pension benefits are indexed to wages with a 2-year gap, which means they follow the wage development in a lagged manner.
- Denmark is at low risk of not meeting EU debt requirements, owing to the decrease in public pension expenditure as well as fiscal sustainability and more favourable initial fiscal position.
- Due to high coverage of the funded tiers, there is less pressure on public finances, while replacement rates are comparatively high and old-age poverty is comparatively low.

2.7. Italy

2.7.1. Demographic profile and forecast

As visible from Table 13 Italy's population will shrink considerably between the years 2019 and 2070. The negative population growth rate is observable despite a pronounced positive net migration. The old-age dependency ratio, denoting the ratio of those aged 65 and older to those between 20 and 64 will increase sharply during the next 50 years. While it amounted to 38.9 in the year 2019, the ratio is projected to attain 65.6 by the year 2070.

This forecast is mainly driven by the fact that Italy features one of the lowest birth rates in the world which is likely to persist within the foreseeable future. Together with increasing life expectancy, it is this **extremely** low birth rate that is particularly important for the aging of the population. The rise in longevity is shown in Table 13. Not only will the ratio of those aged 80 and older to those over 65 rise sharply within the next decade. This underscores the fact that people will live longer. But also the actual life expectancy is significantly on the rise. A life expectancy of 85.7 years was calculated for a woman born in 2019 (81.3 years for men), while the average life expectancy for women born in 2070 is projected to be 90.9 years (87 years for men).

Table 13: Italy: Demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	60,323	59,923	59,333	58,035	55,874	53,874	60,323 → 53,874
Population growth rate	-0.2	-0.1	-0.1	-0.3	-0.4	-0.3	-0.2 → -0.3
Old-age dependency ratio (pop 65+ / pop 20-64)	38.9	48.0	61.4	66.5	65.5	65.6	38.9 → 65.6
Old-age dependency ratio (pop 75+ / pop 20-74)	16.7	19.7	25.2	32.8	33.5	32.1	16.7 → 32.1
Ageing of the aged (pop 80+ / pop 65+)	31.7	32.2	32.6	41.0	45.8	43.5	31.7 → 43.5
Men - Life expectancy at birth	81.3	82.6	83.8	84.9	86.0	87.0	81.3 → 87
Women - Life expectancy at birth	85.7	86.9	88.0	89.0	90.0	90.9	85.7 → 90.9
Men - Life expectancy at 65	19.6	20.5	21.4	22.3	23.1	23.9	19.6 → 23.9
Women - Life expectancy at 65	22.9	23.8	24.7	25.6	26.4	27.2	22.9 → 27.2
Men - Survivor rate at 65+	90.0	91.5	92.6	93.6	94.4	95.1	90 → 95.1
Women - Survivor rate at 65+	94.2	95.1	95.7	96.3	96.7	97.1	94.2 → 97.1
Men - Survivor rate at 80+	64.9	69.4	73.1	76.3	79.3	81.9	64.9 → 81.9
Women - Survivor rate 80+	78.9	82.0	84.4	86.5	88.4	90.0	78.9 → 90
Net migration (thousand)	134.7	224.0	217.2	214.3	210.5	206.6	134.7 → 206.6

Source: European Commission - Created with Datawrapper

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The average labour market exit age among men and women will continue to shift upwards during the next decades, as shown in Table 14. While in 2020, it amounted to 65.2 years for men, the average exit age will already be 68.5 years by 2070. An even greater increase can be observed for women, namely from 65.8 years in 2020 to 69.3 years 50 years later. The institutional adjustments regarding leaving the labour market for retirement aim to address the rise in longevity. In fact, despite the increase in the average labour market exit ages over the years, the percentage of life spent in retirement remains unchanged for both, men and women.

Table 14: Italy: Exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labour market exit age (CSM) - Men	65.2	66.0	66.4	67.0	67.8	68.5	65.2 → 68.5
Duration of retirement - Men	19.6	19.7	20.6	20.6	20.5	21.2	19.6 → 21.2
Percentage of adult life spent in retirement - Men	29.3	29.1	29.8	29.6	29.2	29.6	29.3 → 29.6
Early/late exit - Men	2.0	1.7	2.9	2.3	2.3	3.2	2 → 3.2
Average labour market exit age (CSM) - Women	65.8	66.9	67.6	68.2	68.8	69.3	65.8 → 69.3
Duration of retirement - Women	22.0	22.1	22.0	22.9	22.7	23.5	22 → 23.5
Percentage of adult life spent in retirement - Women	31.5	31.1	30.7	31.3	30.9	31.4	31.5 → 31.4
Early/late exit - Women	3.2	1.4	2.4	1.5	1.6	2.4	3.2 → 2.4

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

The role of migration

Figure 31 demonstrates that migration plays an important role in preserving Italy's working population over the course of the next decades. Without migration, the population aged between 20 and 64 years would be about one quarter lower than in the main scenario. As migrants tend to have a younger age than the resident population, the number of persons aged 65 and over is influenced by migration to a much lower extent.

Figure 31: Italy: Demographic forecast with and without migration (2022-2060)

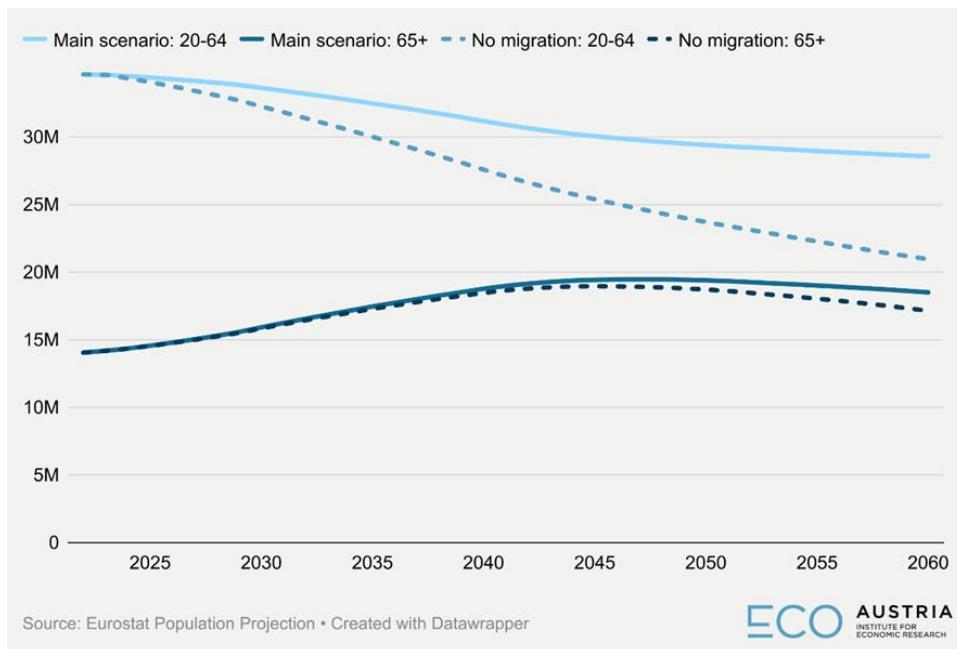
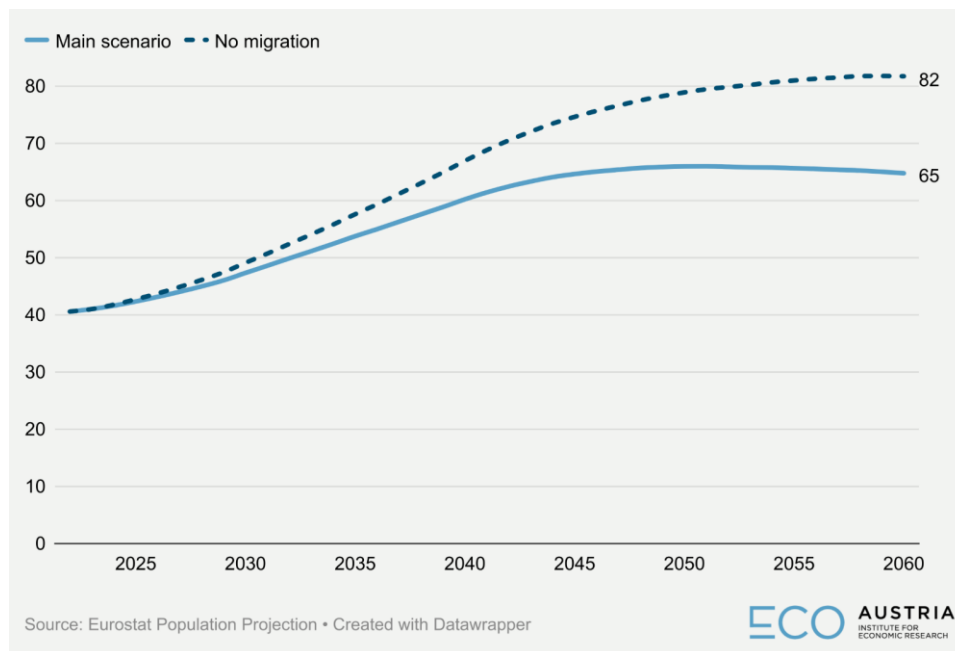


Figure 31 reveals that in the scenario without migration, the number of people aged between 20 and 64 would be almost as high as the part of the population that is older than 65 years by the year 2070.

Figure 32: Italy: Old-age dependency ratio (65+/20-64) in the main scenario and without migration



As visible from Figure 32, the old-age dependency ratio would also be considerably higher without the cushioning effect of migration.

2.7.2. General architecture

The Italian pension system includes a public mandatory and PAYG-based pension scheme for the entire working population as the main element of old-age provision. Standard protection is organised within the framework of this public PAYG system. It universally covers employees and self-employed persons, according to their profession and industry affiliation. Persons employed are either subject to a general pension scheme or to mandatory insurance in comparable public schemes. The general compulsory pension system ("Assicurazione generale obbligatoria", AGO) is organised by several professional social insurance schemes. All these systems are PAYG and most of them are organised by the National Social Security Institution ("Istituto Nazionale Previdenza Sociale", INPS).

Although substantial efforts have been made to harmonise the various schemes within the general public pension system since the 1990s, the overall system continues to be characterized by strong professional and sectoral segmentation. The public statutory schemes provide for **2nd tier functionalities**, according to the OECD 3-tier classification model (Section 2.1). These schemes are based on a PAYG mechanism with earnings-related benefits being linked to contributions paid throughout a person's career. The public pension system itself does not integrate the provision of **1st tier minimum income**. Instead, special tax-financed social assistance measures are available.

Complementary **2nd and 3rd tier pensions** ("Previdenza complementare") are provided as voluntary, capital-funded occupational or individual pension schemes. Beyond these

complementary forms of funded pensions, employees are automatically enrolled into the complementary occupational pension schemes. This takes place within the framework of the Italian severance pay scheme. Through a mechanism of “silent consent”, the employer’s contributions to the severance-pay scheme are automatically transferred to a complementary occupational pension scheme.

3rd tier pension provision takes the form of voluntary individual participation in private pension plans. New forms of complementary individual pension plans, based on life insurance contracts, were introduced in 2000. They are offered by insurance companies and are incentivised by tax deductions and supervised with similar conditions as funded occupational pensions. According to information from the Supervisory Commission COVIP (“Commissione di vigilanza sui fondi pensione”), 9.1 million Italians were enrolled into at least one collective or individual pension plan. This corresponds to a coverage rate of 36.2% of the working population (Better Finance 2023, 2023).

- **1st tier minimum pension income** is provided by means-tested social assistance programs. Three instrument are relevant: the „Assegno sociale“ as a social assistance benefit for people over the retirement age, the „Maggorazione sociale“ is a top-up or increase benefit to small pensions and the „Pensione di cittadinanza“ as a citizenship pension for older people in need, dependent on the duration of residence.
- **2nd tier standard protection** is ensured by the general compulsory statutory old-age insurance scheme AGO („Assicurazione generale obliigatoria“). The public pension system is divided into various professional and sector specific PAYG schemes, e.g. for public sector employees, private sector employees in general, for craftsmen, shopkeepers, farmers, liberal professions. The statutory public pension system constitutes the main and often the only retirement income.
- **2nd tier pensions can be supplemented** by complementary occupational and funded plans under the „Previdenza complementare ad adesione collettiva“ scheme. Strictly speaking, the participation is voluntary, however occupational schemes are laid down in collective agreements or company agreements. Participation is open to all insured persons of the AGO scheme and comparable protection schemes respectively, but access conditions differ by the type of fund. Closed or contractual pension funds („Fondi pensione negoziali“) are the result of collective bargaining between employers’ associations and trade unions on a sectoral or company level. These schemes follow the corporatist tradition of the Italian labour and welfare system. These closed schemes are implemented either as company pension funds by a single company, as industry-wide pension funds, set up by the employers’ association and the trade unions for a specific group of workers, or as territorial funds that provide inter-professional coverage in three of the five autonomous provinces in Italy. The closed systems are offset by complementary occupation pensions from open funds (“Fondi pensione aperti”). These are organised by banks, insurance companies, investment companies and asset management companies. They are open to general, non-professional groups of participants (e.g. self-employed people) and also to individual voluntary participation in

the 3rd tier. Open pension funds offer both occupational pension plans with collective affiliation and personal pension plans with individual affiliation. The state encourages participation in supplementary pension systems through tax reliefs. However, complementary pension funds still cover only a minority of the Italian labour force, which is also due to a weak performance of funds (Better Finance 2023, 215).

- In addition to contractual and open funds, the pre-existing funds (“Fondi pensione preesistenti”) are a third institutional form for complementary 2nd tier occupational pensions. They can be set up either as autonomous and independent funds or as non-autonomous funds based, for example, on the employer’s book reserves. The form of pre-existing funds is a relic of the transition process of complementary occupational pensions from a defined benefit to a defined contribution form. All complementary pension funds now operate on a DC basis, as this is the only permitted type of pension plan. DB plans are limited to existing funds that were in operation before November 1992 and existed before the transition to the DC model.
- The system of complementary occupational pensions provides for an auto-enrolment mechanism for employees. This mechanism is based on the Italian severance pay system TFR („Trattamento di Fine Rapporto“). The automatic enrolment of employees through the TFR scheme therefore forms a component of the complementary occupational pension system. The TFR is a deferred indemnity that requires employers to set aside a portion of the employee’s salary, that is accumulated and returned to the employee upon termination of the employment contract. As of 2007, employees choose whether to invest their annual TFR severance pay provision in a pension plan or to keep it in their company as a backup in the event of redundancy or as an additional lump sum benefit after retirement.
- Supplementary pensions are also provided as capital-funded individual pension plans, so-called PIP (“Piani individuali pensionistici”) under the “Previdenza complementare ad adesione individuale” scheme. These individual voluntary pension plans have the character of **3rd tier individual funded pensions**. New forms of capital-funded individual pension plans based on life insurance contracts were introduced in 2000. They are offered by insurance companies and are incentivised by tax deductions and supervised with similar conditions as funded occupational pensions. Individuals can also participate in the above-mentioned open funds (“Fondi aperti”) through individual affiliation.

Eligibility

Old-age pension requirements in 2020, for private and public employees, is 67 years with a minimum of 20 years of contributions (OECD 2021h). Italy is also one of the seven OECD countries that links the retirement age with life expectancy. This link aims at avoiding that people retire too early with too low pensions as well as promoting employment at older ages. Thus, the future retirement age in Italy will be 71 years for generations entering the labour market now. It ranks among the highest in the OECD (average: 66 years), only surpassed by Estonia (71 years) and Denmark (74 years). (OECD 2021h)

In 2020, early retirement is possible if contributions have been paid for at least 42 years and ten months for men and 41 years and ten months for women, increasing in line with life expectancy.

First-tier and second tier pensions by the public statutory pension scheme

The Italian pension system does not include an integrated first-tier minimum pension. An existing minimum pension guaranteed within the statutory general pension insurance was abolished for new entrants as of 1996. Special tax-financed social assistance measures are available to secure the minimum income in the **1st pension tier**. For older people aged 67 and over who have lived in Italy for at least 10 years, a means-tested monthly social assistance benefit – the so-called “Assegno sociale” – can be granted. The qualifying age for this benefit is adjusted in accordance with changes in life expectancy. The social allowance has the form of a welfare support. It is not tied to the payment of contributions. The allowance is tax exempt.

In addition to pension benefits, pensioners with low pensions can claim an income-related monthly supplement, the so-called social increase benefit (“Maggiorazione sociale”). The amount of the social increase is staggered according to the age of the recipient. Finally, a means-tested citizenship pension (“Pensione di cittadinanza”) for senior persons was introduced as of April 2019, subject to the same residence clause but with more restrictive access conditions with regard to the means-testing criteria than the “Assegno sociale”. During 2020, the “Assegno sociale” for a single individual amounted to EUR 5,978 on an annual basis, distributed across 13 monthly payments equivalent to EUR 460 per month. For pensioners with low pensions an extra monthly social benefit, referred to as the “Maggiorazione dell’assegno sociale,” can be granted. This supplementary amount can reach up to EUR 192 per month, elevating the total benefit to EUR 8,470 annually (OECD 2021h).

In Italy, standard mandatory **2nd tier protection** is organised within the scope of the public PAYG system. The PAYG mechanism is currently shifting from a defined benefit (DB) to a defined contribution (DC) system. However, the transition period will be long because the NDC scheme fully covers only those who had not worked before 1996. The PAYG system operates with a contribution rate of 33%. Within this, approximately one-third is covered by the employee, while the remaining two-thirds are borne by the employer. Upon retirement, the pension benefit is determined by computing the cumulative lifelong contributions, adjusted by the nominal GDP growth rate (measured as a five-year moving average), and a factor known as the transformation coefficient. NDC rules follow actuarial principles, implying that pension levels are adjusted to both retirement age and changes in life expectancy. These mechanisms contribute to financial sustainability and will only be fully effective when the transition is completed, i.e. around 2045.

This transformation coefficient is shaped by factors such as the likelihood of mortality, the probabilities of leaving a surviving spouse, and the anticipated duration for which survivor benefits would be received. Consequently, the benefits one receives are intimately tied to the age at which retirement occurs - a younger retirement age translates to a lower pension amount.

In the year 2020, the minimum income taken into account for contribution calculations stood at EUR 206 per week, representing 40% of the minimum pension. Meanwhile, the upper limit of earnings for benefit calculations was capped at EUR 103,055 per year under the new regulation.

Regarding the indexing of pensions being received, the system follows a progressive approach. This means that the adjustment to pensions through indexing is more generous for individuals receiving lower pension amounts, as opposed to those with higher pensions. The indexation formula for pensions received in 2020 is structured as follows:

- 100% of the "cost-of-life" index for pensions up to three times the minimum pension
- 97% of the "cost-of-life" index for pensions up to four times the minimum pension
- 77% of the "cost-of-life" index for pensions up to five times the minimum pension
- 52% of the "cost-of-life" index for pensions up to six times the minimum pension
- 47% of the "cost-of-life" index for pensions up to eight times the minimum pension
- 45% of the "cost-of-life" index for pensions up to nine times the minimum pension
- 40% of the "cost-of-life" index for pensions exceeding nine times the minimum pension.

In essence, the notional accounts system ensures a certain level of equity and fairness in pension benefits, taking into account various contributing factors such as contributions, economic growth, age of retirement, and indexing principles.

The contributory public pension is taxable. As of 2020, pensions are subject to the following tax rates based on their income levels:

- 23% for pension income up to EUR 15,000
- 27% for pension income between EUR 15,001 and EUR 28,000
- 38% for pension income between EUR 28,001 and EUR 55,000
- 41% for pension income between EUR 55,001 and EUR 75,000
- 43% for pension income exceeding EUR 75,000

Notably, pensions falling below EUR 8,125 annually are exempt from personal tax obligations, irrespective of the age of the pension recipient. Contributions made to the public pension system are entirely deductible from the individual's income prior to taxation.

As mentioned, Italy is one of the nine OECD countries linking the statutory retirement age with life expectancy (OECD 2023d). As of 2023, the statutory retirement age is 67. For current labour market entrants, the normal standard retirement age is projected to reach 70 years in Italy. However, the high statutory retirement age is not binding for many workers as Italy provides broad access to early retirement, often without a penalty. In 2023, Italy extended early retirement options which were supposed to expire by 2022.

Funded second and third tier

Funded occupational pensions are available to employees of the various social insurance schemes in the statutory pension insurance system. These pension schemes are offered within the system of complementary occupational or collective pensions ("Previdenza complementare ad adesione collettiva"). Complementary occupational pensions supplement standard old-age protection. Specific funds and schemes differ in access conditions: "Closed" pension funds, often referred to as contractual pension funds²⁷ ("Fondi pensione negoziali"), are the result of collective bargaining between employers' associations and trade unions. They are implemented either as

²⁷ Contractual funds are also called „closed funds“ due to their restrictive membership criteria: only members of the specific firm or economic sector for which the fund was established can join in.

single company pension funds or as industry-wide pension funds set up by the employers' association and the trade unions for a specific group of workers (including self-employed workers). Territorial funds with inter-professional coverage in three of the five autonomous provinces represent a third form of closed funds. Closed funds can be financed by both employers and employees. By contrast, "open" pension funds ("Fondi pensione aperti") are set up by banks, insurance companies or investment companies and asset management companies for generic groups of participants (i.e. the self-employed). They can offer both collective occupational pension plans and personal pension plans with individual affiliation. Regardless of the availability of different forms of occupational funded pension schemes, the actual number of employees enrolled in private pension funds remains relatively limited (OECD 2021h).

Starting from 2007, employees choose whether to invest their annual severance pay provision ("Trattamento di Fine Rapporto", TFR) in an occupational pension plan or to keep it in their company. The TFR is a mandatory severance pay plan to which all employers in Italy must contribute on behalf of their employees. The current contribution rate is 6.91% of gross salary. The funds that are invested undergo a process of capitalization annually. This involves applying a fixed rate of 1.5%, along with a variable component that corresponds to 75% of the yearly increase in the consumer price index.

In the year 2000 new forms of funded pension plans ("Previdenza complementare ad adesione individuale") based on individual contracts ("Piani individuali pensionistici" PIP) were introduced. They are offered by insurance companies and are incentivised by tax deductions and supervised with similar conditions as complementary occupational pension schemes. A distinction is made in the individual plans between PIP with a profit guarantee, so-called "with profit" contracts ("gestione separata"), and unit-linked products. The with-profits policies guarantee a minimum rate of return. Around two thirds of assets under management in new PIP contracts include a profit guarantee (Better Finance 2023, 223). The unit-linked policies do not have a guarantee. According to data from the Supervisory Authority COVIP, the performance is similarly weak for both types of individual pension products. This should also be seen against the background of the generally disappointing development of the Italian financial and insurance markets.

Currently, all complementary pension funds operate on a DC basis, as this is the only permitted type of pension plan. DB plans are restricted to older funds ("pre-existing" funds). Accordingly, the entire pension system is being converted from a defined benefit (DB) to a defined contribution (DC) system – also in view of the conversion of the public statutory system to an NDC system.

2.7.3. PAYG and fiscal challenges

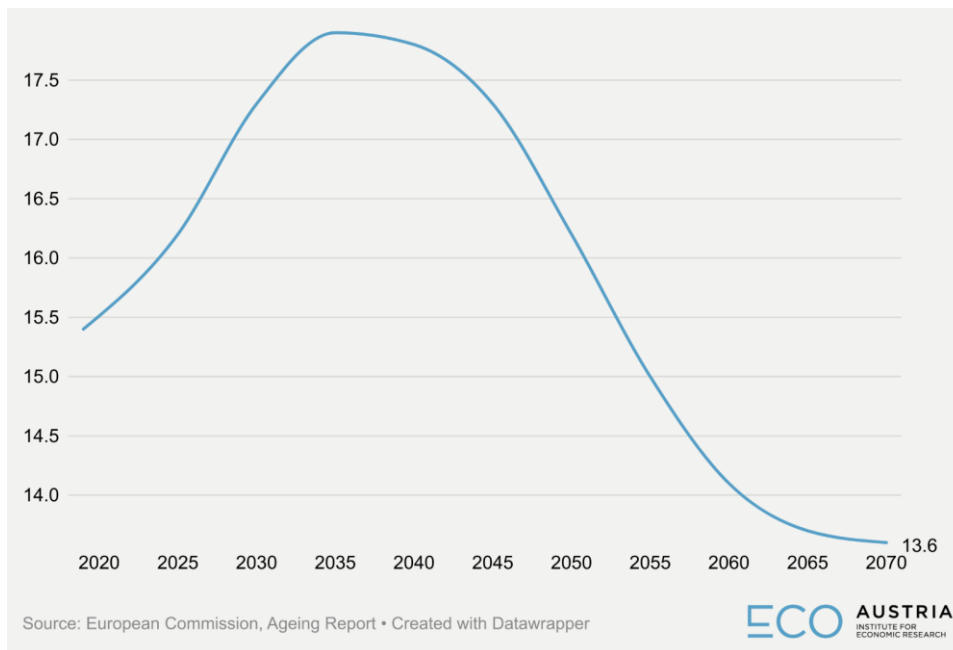
Public expenditure

Together with Greece, Italy spends the largest proportion of national income on public pensions among OECD countries. Between 2000 and 2020 public pension spending has increased by roughly 2.5 percentage points, namely from 13.5 per cent of GDP to about 16 per cent of GDP. The OECD average rose from around 6.5 per cent of GDP to 7.7 during the same time horizon. Public pension expenditure is anticipated to experience significant growth over the next two

decades, as can be seen in Figure 33. According to the projections put forth by the European Commission, spending on pensions is set to reach its peak around the year 2030. During this period, expenditures are projected to account for nearly 18 percent of the GDP. The main driver of the increase in expenditure is demographic change.

After 2040 cuts in benefits for future retirees at least relative to wages, through lowered indexation and valorisation of benefit formulae, together with increases in the age at which individuals can first claim pension benefits, will reduce growth in public pension expenditure (OECD 2023b).

Figure 33: Italy: Forecast of public expenditure on pensions (in % of GDP)



Italy stands out among the OECD nations as a place where individuals aged 65 and above enjoy favourable income conditions. In terms of relative proportions, the income for those aged 65 and above is approximately equivalent to, if not slightly higher than, the income for the entire population.

As in many other OECD countries, average income tends to fall with age after retirement. Likewise, women in retirement are at greater risk of poverty than men due to lower earnings-related pension income and longer life expectancy.

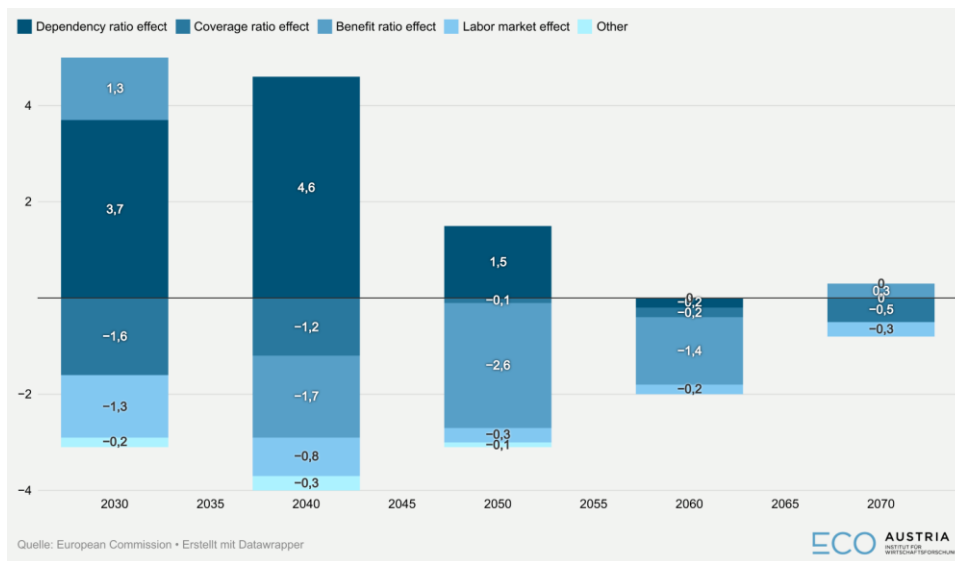
The gross replacement rate, which signifies pension income relative to pre-retirement earnings, surpasses the OECD average notably, registering at 74.6 percent for both men and women in the year 2020.

Moreover, the gross pension wealth, measured as a multiple of average annual gross earnings, surpasses the OECD average as well. Specifically, it stands at 11.7 times the average annual earnings for men and an impressive 13.2 times the average annual earnings for women (OECD 2021).

Forecast of public expenditure

The breakdown of pension expenses as a portion of the country's economic output, as outlined in Figure 34, unsurprisingly illustrates that the ongoing demographic shift and the projected rise in life expectancy will notably impact pension-to-GDP estimations in a negative manner. This effect, quantified through the dependency ratio, accounts for an increase of 9.5 percentage points over the entire projection period. Notably, it is during the timeframe of 2020 to 2040, which coincides with the retirement phase of the baby boomer generation, that the dependency ratio experiences its most pronounced increase.

Figure 34: Italy: Components of change in the public expenditure



Looking ahead, the long-term viability of the pension system, challenged by these adverse demographic trends, is anticipated to remain intact due to counterbalancing mechanisms prompted by prior pension reforms. This resilience stands despite the heightened pension expenses stemming from recent temporary measures implemented between 2018 and 2019.

In particular, the anticipated evolution of the benefit ratio is poised to contribute negatively to pension expenses as a proportion of GDP, demonstrating a decrease of around 4.3 percentage points. This is primarily attributed to the gradual implementation of the NDC scheme and the indexing of pensions to price inflation. Similarly, the anticipated evolution of the coverage ratio is projected to bring down pension expenses as a percentage of GDP by approximately 3.5 percentage points between 2019 and 2070. This reduction is due to the raised eligibility requirements and their alignment with shifts in life expectancy.

Lastly, the impact resulting from an employment ratio decrease of 2.9 percentage points is largely driven by the delayed retirement age (EU 2021).

Forecast of replacement rates

The decrease in the benefit ratio that can be observed in Table 15 primarily stems from normative changes. Alongside the adjustment of pensions solely based on price inflation, a significant factor is the gradual transition from the DB system to the NDC model. This transition is further supported

by the regular update of transformation coefficients aligned with assumptions about mortality rates.

Table 15 also illustrates the changing trend in the replacement rate. This rate signifies the relationship between the average pension (for both new retirees and those taking early pensions) and the total average wage or labour income at the time of retirement. Initially this measure remains notably elevated, averaging at 67%. This pattern arises due to the retirement of employees under the DB and mixed regimes, resulting in relatively higher pension benefits.

Afterward, the replacement rate experiences a decline. As the NDC calculation method gradually solidifies, coupled with a resurgence in productivity growth, the ratio diminishes. It reaches its lowest point of approximately 45% around 2050 before rising once more. By the conclusion of the projected period, it approaches nearly 51%. Notably, during the transitional phase, the adjustment of pension values to inflation helps narrow the gap between the older pensions, calculated using more generous DB regulations, and the newer pensions linked to current earnings (EU 2021).

Table 15: Italy: Benefit ratios and replacement rates until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Overall benefit ratio	61%	64%	57%	49%	45%	46%	-15.2
Earnings-related benefit ratio	62%	67%	59%	50%	46%	47%	-14.7
Earnings-related replacement rate	67%	55%	46%	45%	49%	51%	-15.4

Source: European Commission • Created with Datawrapper

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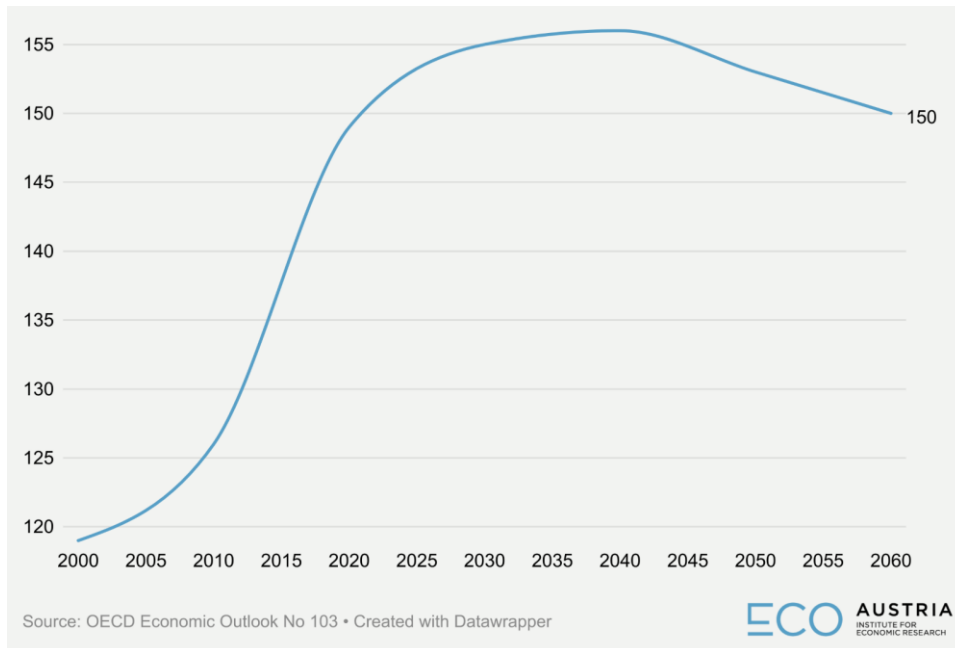
Forecast of debt levels

Fuelled by the rise in public expenses, debt in Italy is projected to rise significantly until the year 2045, as can be seen in Figure 35. At their peak, gross financial liabilities are expected to exceed 155% of GDP before gradually declining to 150% by the year 2070.

Italy's public finances are considered at high risk over the medium term on the account of the results of the S1 sustainability indicator.

However, according to Commission assessment, the indicator of long-term sustainability S2 indicates that Italy's debt is one of the more sustainable in the long term among the EU countries.

Figure 35: Italy: Projection of long-term gross financial liabilities (in % of GDP)



2.7.4. Funded Pensions (Second and third tier)

Voluntary/Mandatory, Occupational/Personal, Book reserves

Funded complementary pension plans are both occupational and personal. They form the complementary second and third tiers of the Italian pension system. Membership to complementary pensions is generally not mandatory. Since 2007, there has been a system that automatically directs severance pay contributions to the TFR system (“Trattamento di Fine Rapporto”) into complementary funded pensions: If an employee does not make an active choice after a six-month period the annual severance pay will be automatically paid into an occupational pension plan.

Individual pension plans (PIP) can be implemented through pension funds or insurance-based contracts. New contracts must be based on a defined contribution method. Insurance companies provide individual pension plans through life insurance contracts (PIPs), catering to individual participants exclusively. These plans necessitate a distinct segregation of assets from those held by the managing insurance company.

Contractual collective pension plans are the result of collective bargaining. Contractual funds are separate legal entities, ensuring a clear distinction between the fund and the sponsoring employers. Membership is limited to employees or self-employed individuals who meet certain conditions that are set in the collective agreements. Contractual pension funds are not allowed to manage directly their assets. The governing board must, therefore, delegate such activity to professional managers (banks, insurance companies, investment firms and asset management companies). The governing board, which includes representatives from both employers and employees, oversees the fund's operations. Their role involves ensuring that the fund is managed in the best interests of its members and beneficiaries and in accordance with legal and regulatory

requirements. The Board of Directors is responsible for establishing strategies and investment policies, as well as choosing investment managers, the depositary bank and the provider of administrative services. The Committee has a general control duty and control functions. An important role is played by the General Director or Head of the Fund. This person executes the decisions of the Board and is responsible for the fund, checking that operations are carried out exclusively in the interest of fund members.

Pension funds that were already in operation prior to the enactment of Legislative Decree No. 124 of 1993 are referred to as pre-existing pension funds. They come in the forms of defined contribution and defined benefit schemes. Notably, all existing defined benefit plans ceased accepting new members, and a significant number of them have been concluded and transformed into defined contribution schemes. As a result of the recent pension reform, pre-existing pension funds are expected to become an ever-shrinking share of the private pension system since the new legislation does not allow them to expand further their membership area.

Investment regulations

The Pension Funds Supervisory Board COVIP (“Commissione di vigilanza sui fondi pensione”) acts as supervisory authority for both the occupational pension schemes provided by contractual and closed funds and by open funds and individual pension plans.

The existence of a minimum return or profit guarantee or a capital guarantee depends on the pension scheme or contract. A capital guarantee is not mandatory for complementary pensions. As already mentioned, individual PIP contracts take the form of “with-profit” or “unit-linked” contracts. Depending on the choice of the individual participant or the framework conditions of the collective agreement, they may or may not provide for a profit guarantee. The actual investment performance for both forms of individual pension products is weak. The Supervisory Authority for complementary pensions, COVIP, provides information on the risk structure of pension contracts (COVIP 2023, 14, Table 15). Accordingly, the individual PIP contracts particularly have a very risk-adverse structure. More than 66% of participants have profit-guaranteed “with profit” plans. As regards “closed” contractual pension funds, 26% of participants have guaranteed contracts. Open funds show a more risk-friendly or at least more balanced structure. The corresponding share for profit-guaranteed plans is 14%.

According to information in OECD’s 2022 report on investment regulation of pension funds (OECD 2022c) investment regulation imposes maximum limits on certain asset classes. The information applies to the complementary occupational pension. Investment regulations are largely identical for contractual or closed funds, open funds and so-called pre-existing pension funds. Restrictions and ceiling-limits apply for investment in real estate, retail investment funds, private investment funds and bank deposits. Direct investment in real estate is generally prohibited. A 20% limit applies to investment in real estate funds. Direct investments in retail and private investment funds are permitted according to the investment regulation regime, under the condition that investments are compliant with the EU directive on UCITS (Undertakings for Collective Investment in Transferable Securities). A cumulative limit of 30% applies to investments in real estate funds, non-UCITS compliant investments and securities not traded in regulated markets. Bank deposits

are permitted provided the purpose and extent serve to ensure adequate liquidity. Pension funds are not expected to hold bank deposits as a major share of their assets.

The investment regulation of complementary pension providers in Italy also includes rules on investment abroad. First, there is limit regarding the overall share of foreign assets. However, some restrictions apply to certain asset classes, in particular direct investment in foreign real estate and foreign currency loans. According to the OECD information (OECD 2022c), such restrictions do not apply to foreign investments nor to bonds issued by public administrations or private companies. Again, direct investment in real estate is not allowed. As regards investment in retail investment funds, there are no restrictions on investments in foreign asset classes that are held indirectly via EU-compliant UCITS. A cumulative limit of 30% for investments in real estate funds, non-UCITS investments and securities not traded in regulated markets has already been mentioned. Foreign currency loans are generally restricted. No specific limits are set for exposure to foreign assets held in private investment funds.

As regards limits to single issuer investments, a 5% cumulative limit applies to equities, bills and bonds issued by a single issuer. The corresponding limit is 10% for securities issued by companies that are part of the same group. No ceiling is set for investment in bills and bonds by public administration, if it is an OECD country.

Assets allocated

At the end of 2021, approximately 9 million members had joined Italian pension funds. Total assets under management reached approximately 210 billion euro. At the end of 2022, a total of 9.2 million members had joined pension funds. Total net assets under management amounted to around 206 billion euro, representing approximately 11% of GDP and 4% of financial assets of households (COVIP 2022).

At the end of 2021, pension fund assets were mainly invested in debt securities (53.7%), mostly government bonds; 22.6% in equities and 16% in mutual funds. Domestic investments accounted for 22.7% of total assets (40 billion euro), most of which were government bonds. Investments in securities issued by Italian companies were small: 4.7 billion euro (2.6% of total assets), of which 3 billion were corporate bonds and the remaining were equities.

In terms of allocation of pension savers' assets, both contractual and open pension funds implement conservative investment policies. Contractual pension funds invest only a quarter of their assets into equity, whereas over 50% of assets are invested in debt securities. Open pension funds are only slightly less conservative, with 30.1% invested in equity and "only" 43.3% in bills and bonds (Better Finance 2023, 222).

Investment performance

Over a 10-year period from December 2011 to December 2021 the average annual investment rates of return of funded and private pension plans was 2.5% (OECD 2022). This puts Italy in the middle of the OECD countries considered. In principle, many of the economically highly developed OECD countries have higher comparative values, such as Switzerland and Denmark with 5% or Finland with 5.6%. The authors of the Better Finance report (2023, p. 216) describe the

investment performance of Italian pension funds as disappointing. Over a ten-year observation period, annualized real net returns for contractual pension funds amounted to 0.3%. The comparative values were 0.5% for open pension funds, 0% for PIP “with profits” and 0.9% for unit-linked PIP. With real rates of return of more than minus 10%, the most recent development in 2022 was particularly “catastrophic”. COVIP’s end of the year report for 2022 also comes to similar results: In 2022 the average net return of pension funds was negative: on average, -9.8% for contractual pension funds and -10.7% for open pension funds. As for “new” PIPs, the average return of unit-linked products was -11.7%, and that of with-profit products was 1.2%. Over 20 years from 2002 to 2022 the average net annual rates of return were 2.9% for contractual pensions and 2.7% for open pension funds (COVIP 2022, 2 and Table 18, 16). The annual average TFR revaluation, net of taxes, was 2.4 percent.

Tax treatment

Italy adopted an ETT system as an incentive to complementary pension schemes. Therefore, contributions enjoy favourable fiscal treatment, while accrued yields and benefits are taxed. Contributions can be deducted from workers’ taxable income up to 5,164.57 Euro per year. Employers’ contributions are included in the ceiling calculation. Investment returns on funds are taxed at a 11% rate. In order to avoid a double levy, benefits are taxed only for the share not already assessed during the accumulation phase. Therefore, taxation at the time of retirement applies only to deducted contributions, since non-deducted contributions and investment returns have already been taxed. Both annuities and lump-sum payments enjoy the same fiscal treatment. The tax rate on benefits varies from 9% to 15%, depending on the length of member participation. The maximum rate is charged to members whose seniority is lower than 16 years. The rate decreases yearly until it reaches its minimum at a tenure of 35 years (COVIP 2021).

2.7.5. Highlights and main features of the system

1. Strengths and weaknesses (according to OPI)
<ul style="list-style-type: none"> - High adequacy (OPI 0,80), medium market capitalization (OPI 0,13), but very low sustainability (OPI 0,1) - The slow transition from the old DB system to the NDC system will lead to high fiscal pressure in Italy, which ultimately will also increase Italy's debt level. The reforms that are set will decrease current replacement rates, however, it has to be noted that earnings-related replacement rate was comparatively high with 67% in 2019. Funded occupational and private pensions are tax-incentivized since 2007, however participation in private pension schemes remains limited.
2. Tax treatment
<ul style="list-style-type: none"> - Across all schemes ETT, however pension benefits are only taxed on the part, that has not already been taxed during the accumulation, that means returns and contributions over the tax-deduction limit are not taxed again.
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - Contribution rate of 33%, with one third covered by the employee and two thirds by the employer - Additionally, employees can choose to invest their annual severance pay provision, which is equal to 6.91% of gross salary, split based on collective agreement
4. Asset Allocation
<ul style="list-style-type: none"> - Equities (25.1%), bills and bonds (42.7%), cash and deposits (6.1%) and Other (26.1%)
5. Obligatory character
<ul style="list-style-type: none"> - All employees and self-employed are subject to mandatory social insurance schemes. These are tied to their profession/sector. - Supplementary pensions are mostly voluntary, fully-funded occupational schemes. However, access to these schemes differs based on collective bargaining (closed funds) or generic groups of participants (open funds)
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - Occupational pension schemes: life-long annuity or 50% of accumulated capital as lump-sum payment, 100% if lump-sum would be low - Individual pension plans: same as occupational, with the addition that full lump-sum payments are possible, if 70% of the accumulated capital leads to an annual pension lower than 50% of the social allowance
7. Contribution rate to funded plans
<ul style="list-style-type: none"> - Contributions by employees direct to fully-funded pension schemes were equal to 0.8% of GDP in 2021 (or latest year available), while the same metric was equal to 0.1% for employers
8. Investment performance
<ul style="list-style-type: none"> - 10-year average investment rate of return 2011-2021: 2.5% - At the same time the OECD average was 3.7%.

Additional information and results

- Nowadays, the Italian pension system is a public, mandatory PAYG scheme covering the whole resident population. After a transitional phase, the adoption of a notional defined contribution scheme is envisaged as well as a link of eligibility requirements for both old-age and early retirement to changes in life expectancy and the indexation of pensions to price inflation.
- The public statutory pension system with its professional and sector-specific social insurance schemes provide the main and often the only form of pension provision. The overall system includes complementary occupational and individual funded pension plans. However, although the State encourages participation through tax reliefs, the take-up of these supplementary pension schemes is still low.
- Driven by demographic change, public expenditure on pensions is expected to rise significantly until the year 2045, before dropping steadily afterwards due to reforms designed to contain public debt.

2.8. Latvia

2.8.1. Demographic profile and demographic forecast

According to the demographic forecast for Latvia (Table 16), the population will decrease distinctively up to 2040, mainly due to a combination of low fertility and negative net migration. From the current 1.9 million people, the population will fall to 1.5 million by 2040 and further to 1.2 million people up to 2070. According to the demographic projection the age structure is expected to shift drastically towards older persons. Whereas the working-age population is expected to decrease, the population aged 65 years and above is expected to increase. According to the most recent projection of the main demographic baseline scenario, working age-population aged 20-64 is expected to decrease from about 1.1 million people in 2022 to about 870,000 people in 2040 and further to about 653,000 people in 2060. Conversely the old-age population of persons with 65 years and above is expected to moderately increase from about 390,000 in 2022 to about 430,000 in 2040 and about 450,000 in 2060. As a consequence, the old-age dependency ratio of people aged 65 years and over compared to the working age population aged 20-64 is expected to increase from 34.6 in 2019 to 53.8 in 2040 and further to 70% in 2060 respectively, according to the Ageing Report. According to an updated and more optimistic demographic projection by summer 2023, an increase from about 36 in 2022 to about 50 in 2040 is expected. However, even in this scenario, the dependency ratio is expected to increase by almost 14 percentage points over the next two decades.

Table 16: Latvia: demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	1,914	1,703	1,528	1,389	1,270	1,178	1,914 → 1,178
Population growth rate	-0.7	-1.1	-1.0	-0.9	-0.8	-0.7	-0.7 → -0.7
Old-age dependency ratio (pop 65+ / pop 20-64)	34.6	45.7	53.8	62.3	69.5	63.6	34.6 → 63.6
Old-age dependency ratio (pop 75+ / pop 20-74)	14.5	17.4	23.2	27.7	31.5	34.6	14.5 → 34.6
Ageing of the aged (pop 80+ / pop 65+)	28.0	27.8	32.9	36.7	38.6	47.0	28 → 47
Men - Life expectancy at birth	70.6	73.3	75.9	78.4	80.6	82.6	70.6 → 82.6
Women - Life expectancy at birth	80.2	82.1	83.9	85.6	87.1	88.5	80.2 → 88.5
Men - Life expectancy at 65	14.5	16.0	17.6	19.0	20.4	21.7	14.5 → 21.7
Women - Life expectancy at 65	19.4	20.7	22.0	23.3	24.4	25.5	19.4 → 25.5
Men - Survivor rate at 65+	69.1	75.2	79.9	83.7	86.9	89.4	69.1 → 89.4
Women - Survivor rate at 65+	87.7	90.0	91.7	93.2	94.4	95.3	87.7 → 95.3
Men - Survivor rate at 80+	32.7	41.9	49.9	57.3	64.1	70.0	32.7 → 70
Women - Survivor rate at 80+	63.7	69.8	74.7	78.9	82.4	85.4	63.7 → 85.4
Net migration (thousand)	-3.9	-7.3	-4.7	-2.3	-0.6	0.7	-3.9 → 0.7
Net migration over population change	0.3	0.4	0.3	0.2	0.1	-0.1	0.3 → -0.1









Source: European Commission • Created with Datawrapper

The “ageing of the aged” indicator, which gives the relationship between persons aged 80 and over to those aged 65 and over, will increase from current 28 to 32.9 in 2040. This will put further

funding pressure on other social policy expenditure such as long-term care and public health. Life expectancy at 65 for men is expected to increase from currently about 15 years to 20.4 years in 2060 and to 22 years in 2070. For women, life expectancy at the age of 65 will increase from about 19.4 years in 2019 to 24.4 years in 2060 and to 25.5 years in 2070. Accordingly, remaining life expectancy from 65 years is going to increase by 7 years for men and by almost 6 years for women respectively. A main challenge for Latvia is, however, a negative net migration, increasing to 7.300 people in 2030 and 4.700 people in 2040. From 2050 (-2.300) onwards net migration is expected to slow down (also Figure 36 and Figure 37).

The eligibility age for statutory pensions in Latvia had been increased to compensate for rising life expectancy. From 1 January 2014 the retirement age has been increasing by three months every year - until 2025 when it will reach 65 years (OECD Pensions at a Glance 2021c, Country Profile Latvia). From 2030 this development has almost no impact on the future development of average labour market exit ages for both men and women (Table 21). The average effective retirement age will rise by about one year up to 2030, for men from 63.2 years to 64.3 years and from 63.8 years to 64.6 for women. After this, average exit ages will stay constant for both men and women.

Table 17: Latvia: exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labour market exit age (CSM) - Men	63.2	64.3	64.3	64.3	64.3	64.3	
Duration of retirement - Men	15.6	16.7	18.2	19.7	21.2	22.5	
Percentage of adult life spent in retirement - Men	25.6	26.5	28.2	29.8	31.4	32.7	
Early/late exit - Men	1.2	1.2	1.2	1.1	0.8	1.0	
Average labour market exit age (CSM) - Women	63.8	64.6	64.6	64.6	64.6	64.6	
Duration of retirement - Women	20.2	20.7	22.0	23.3	24.4	25.5	
Percentage of adult life spent in retirement - Women	30.6	30.8	32.1	33.3	34.4	35.4	
Early/late exit - Women	1.0	0.9	0.9	0.9	0.7	0.8	

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

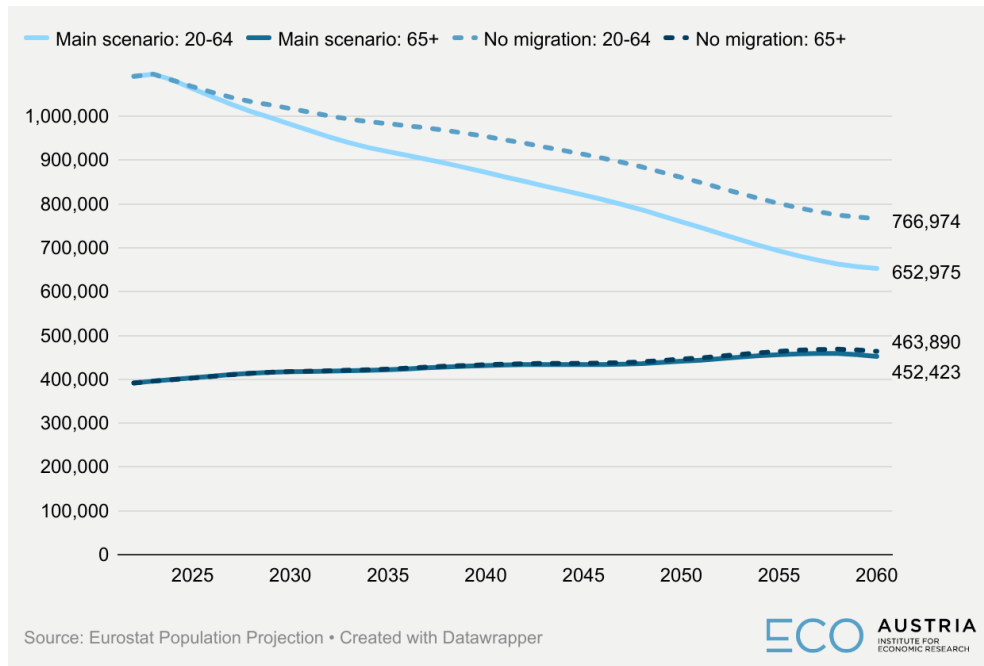
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The role of migration

Negative net migration is likely to have a significant impact on the age structure and lead to a sharp increase in the age dependency ratio. Therefore, negative net migration worsens the expected demographic ageing. Even in the scenario without migration, and thus without the negative consequences of negative net migration, the working age population (20-64) will decline, from currently about 1.1 million people in 2022 to about 767,000 in 2070. In the main scenario, considering negative net migration, however, this decline in the working age population will be much more pronounced. The main demographic scenario takes negative net migration into

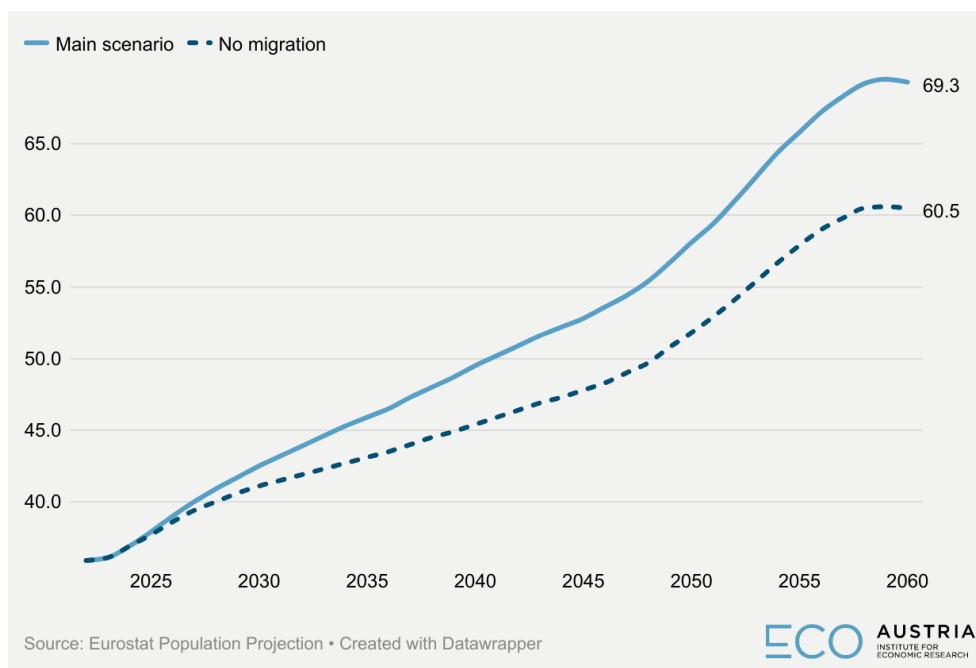
account. Here, an even stronger decrease to about 653,000 persons aged 20 to 64 in 2060 is expected.

Figure 36: Latvia: demographic forecast with and without migration (2022-2060)



At the same time, a rather stable development is expected for the old-age population. According to the main population scenario a marginal increase is expected for persons aged 65 and above, from about 392,000 people in 2022 to 452,000 people in 2060. In contrast to the working age population, migration is expected to have almost no impact on the old-age population. In the no-migration scenario just a slightly stronger increase is expected for the older population to 464,000 people in 2060. Therefore, a negative net migration is also expected for the old-age population, albeit at a distinctively lower level.

Figure 37: Latvia: old-age dependency ratio (65+/20-64) in the main scenario and without migration



As a consequence, old age dependency ratios are expected to increase distinctively, even more so in the main population scenario, from 36 in 2022 to about 50 in 2040 and further to 69 in 2060. In the no-migration scenario the development is projected as less dramatic, but still the old-age dependency ratio would raise from 36 in 2022 to 45 in 2040 and further to 61 in 2060.

For Latvia the main challenges for stabilizing pension expenditure arise from sharply increasing old-age dependency due to low fertility and negative net migration.

2.8.2. General architecture

In an international comparison the Latvian pension system provides for rather moderate pension levels. This means that both benefit ratios and public expenditure on pensions are comparatively low. The Latvian system integrates elements from all three tiers. According to OECD's Pensions at a Glance country profile for Latvia (OECD, 2021c) the earnings-related second-tier system combines a contributory public scheme, based on notional accounts (NDC) and a mandatory funded component (FDC). The NDC component is existing since 1996. The funded occupational scheme was launched later, in 2001. The FDC system is intended to replace the NDC scheme by the mid-2030s. Voluntary private pension funds in the third tier are operating from July 1998.

The overall social insurance contribution rate for the mandatory occupational pension schemes (NDC plus FDC) is 20% of the gross wage. Furthermore, there is a safety-net pension, providing a guaranteed target or minimum pension for pensioners, who have reached the eligibility age and reach the minimum insurance record. For those pensioners, who have reached the qualifying eligibility age but do not reach the insurance record required to claim the full minimum pension, minimum income is provided in combination with means-tested social assistance benefits. Thus, like in Poland, the Latvian pension system is integrating PAYG, NDC and funded components and thus elements from all three tiers. The overall pension system comprises the following elements:

- The 1st tier provides basic pensions derived from pension entitlements under the public mandatory and contributory social security scheme. Minimum income for pensioners who do not meet the required insurance period is achieved in combination with a general and means-tested social assistance benefit.
- The 2nd tier system is based on a mandatory and contributory public NDC scheme. It is transitioning to a mandatory FDC scheme. Currently, second-tier pension entitlements and benefits are based on a combination of both elements. The accumulated FDC capital can be transferred to the NDC scheme administered by the State Social Insurance Agency and added to the NDC capital.
- 3rd tier pensions provide voluntary and funded personal or occupation pension plans. Third tier voluntary pensions are based on DB-, DC- or hybrid DC-/DC-plans.

Qualifying conditions

Women and men who have reached the eligibility age of 64 years and 6 months in 2023 and who have an insurance record of no less than 15 years are entitled to an old age pension (MISSOC and OECD, 2021c). The insurance record may include replacement periods. These are linked to child-care periods, periods of parental leave and maternity, unemployment, sick leave and invalidity, and episodes of paid civilian service, etc. Both conditions, having reached the eligibility age and fulfilling the minimum insurance record, are necessary for receiving a public pension. The mandatory pension system is covering economically active persons, employees and self-employed (MISSOC). However, voluntary membership is possible.

Current and future retirement age

From 1 January 2014 the retirement age has increased by three months every year - until 1 January 2025 when it will reach 65 years. The legal retirement age is currently at 64 and 6 months, according to MISSOC information (updated on 1 January 2023). The legal retirement age will increase to 64 years and 9 months by 2024 and, as mentioned, further to 65 years by 2025.

From 1 January 2014, also the minimum insurance record increased from 10 to 15 years. It will be 20 years from 2025. At present, no further changes for both eligibility ages and qualifying insurance periods are legally anchored.

Pathways to early retirement are institutionally anchored. According to MISSOC, men and women with an insurance period of at least 30 years may claim an early pension two years before the standard retirement age. Given an eligibility age of 64 and 6 months in 2023, the early retirement age is currently at 62 years and 6 months.

Under certain conditions persons might claim an even earlier pension at 59 years and 6 months, 5 years before the legal retirement age. This applies to politically repressed persons with an insurance period of at least 30 years or to persons with an insurance period of at least 25 years, if they have taken care of children (MISSOC).

According to OECD Pensions at a Glance (2021c), it is possible to defer retirement beyond the standard retirement age. According to MISSOC, the basic NDC old-age pension ("*Vecuma pensija*") allows for a full cumulation of benefits with earnings from work. Recipients of old-age

pensions from the NDC scheme may request that the pension is recalculated once a year, if social insurance contributions are paid after an old-age pension has been granted. Full cumulation of benefits with earnings from work is also possible in the FDC scheme, without any restrictions or conditions. In contrast to the NDC system, no more contributions must be paid here.

First-tier pensions

The first-tier pension scheme provides a guaranteed minimum pension. A guaranteed minimum income is set-up by a combination of pension entitlements with supplementary social assistance benefits, paid from the tax revenues from the public budget. Person who are not entitled to a full old-age pension may receive the general public social security benefit, called “Valsts sociālā nodrošinājuma pabalsts”. There is no special social assistance scheme for pensioners. According to the Ageing Report’s country fiche information for Latvia (EU, 2020b) the social assistance benefit targets persons who have reached the retirement age but do not meet the minimum insurance period of 15 years. Thus, the mandatory public pension system in Latvia does not per se guarantee a minimum income for all pensioners. The minimum income target is only achieved by the statutory pension system if pensioners meet the minimum insurance record, which is currently 15 years.

Calculation of basic pensions

The minimum or basic pension is calculated by considering each insurance year, i.e. by applying a multiplying coefficient to a basis amount for a basic old-age pension. The basic amount is EUR 136 in 2023 and EUR 163 for persons with disabilities since childhood, respectively. A coefficient of 1.1 is applied for each year of employment up to the minimum insurance record of 15 years (MISSOC). The coefficient increases dependent on the length of the insurance record. For years exceeding the minimum insurance period of 15 years, the multiplying coefficient increases. Therefore, in 2023 the minimum pension varies from EUR 149.6 in case of 15 years of insurance to EUR 247.5 in case of 51 years. For persons with disabilities from childhood, the corresponding minimum monthly benefits vary from EUR 179.3 to EUR 296.7. The minimum benefit is guaranteed for all pensioners, who have reached the eligibility age and fulfil the minimum insurance requirement.

Second-tier pensions

The mandatory public PAYG NDC scheme is the first component of the second-tier occupational pension scheme. The mandatory pension-system is currently transitioning from an NDC- to a FDC-system. The NDC-system is earnings related and based on contributions and notional accounts. The funded scheme was launched in 2001 and is intended to replace the NDC scheme completely by the mid-2030s (EU Ageing Report, 2020b, country fiche for Latvia, p. 6). Coverage in the FDC pension scheme is mandatory for persons who were under the age of 30 on 1 July 2001. Persons who were between 30 and 49 years in 2001 (born between 1951 and 1971) can affiliate to the FDC scheme on a voluntary basis at any time. In 2035 all voluntary participants will be retired.

The total contribution rate for both schemes, i.e., the public NDC scheme and the FDC scheme, was 20% in 2020, according to OECD’s Pensions at a Glance report (2021, Table 8.1). The share

of contributions dedicated for saving in the FDC scheme has increased gradually, proportionally reducing the contribution rate for the NDC PAYG scheme over the transition period.

Calculation of earnings-related standard old-age pensions

According to the OECD country profile for Latvia (2021c), the pension value is the sum of notional capital at retirement (contributions uprated in line with the covered wage bill) divided by a 'G-value'. The latter reflects the projected life expectancy at retirement age. It is calculated annually a unisex life table.

Benefits from the NDC scheme depend on the age, the insurance record and employment history before the introduction of the NDC scheme in 1996, the contributions paid since 1996 and the dynamics of the contribution wage base, i.e., the growth of the contribution wage sum in Latvia. These factors directly determine the rate of return for the NDC pension capital. If all insurance periods are after 1996, no transitional regulations are considered. P denotes the pension benefit, K denotes the accumulated pension capital and G the remaining life expectancy, the benefit is calculated as: $P=K/G$. According to the country fiche information from the Latvian Ageing Report (EU, 2020b), the contribution wage sum is made up of the total income base, from which social contributions are paid, i.e., employed and self-employed income, pension contributions transfers from the state basic budget and the state special budget, on which contributions are made.

For retirees with insurance episodes earlier to 1996 transitional rules apply. An important element of the transitional rules is the valuation of individual contributions before 1996, when no individual notional accounts existed. Accordingly, for insurance periods up to the year 1995 an initial pension capital is calculated. This initial capital is calculated by using the average individual contribution wage from 1996 to 1999. The formula applied to transitional pensions is: $P=(K_s+K)/G$, where P is the monthly pension benefit, K_s is the pension capital considered as accumulated in the years before 1996, K is again the pension capital accumulated after 1996 and G is again the life expectancy at retirement. Low wage earners had been treated favourably in the calculation of the initial pension capital, by considering the national average wage not the individual contribution wage (EU Ageing Report, 2020b, p. 16).

Indexation of benefits

According to OECD's country profile (2021c), pensions in payment are in general indexed up to a ceiling. This equals 50% to the previous year's average contribution wage. Up to this ceiling, which equalled EUR 454 in 2020, equivalent to 50% of the national average contribution wage in the year 2019, pension payments are indexed. The indexation mechanism favours longer employment respectively insurance records. For an insurance period of 45 and more years the pension benefit that does not exceed 50% of the average contribution wage, is adjusted by inflation and by 80% of the wage index. The wage index is built according to the average contribution wage and inflation is considered based on the price index. For a shorter insurance period from 40 to 44 years, the corresponding adjustment mechanism considers only 70% of the wage index. For an insurance period from 30 to 39 years 60% of the wage index is considered and for periods less than 30 years 50% of the wage index apply for indexation.

For the understanding of the adjustment mechanism, it is important to know that indexation of earnings-related pensions was completely frozen from 2009 to 2012 (EU, 2020b). From 2013 onwards, some indexation mechanisms had been applied, for instance in 2013 in form of an extra indexation for smaller pensions. An actual consumer price index (CPI) and 25% of the real increase in the contribution wage sum were used for the pension indexation between 2014 to 2016, with a ceiling applied to the indexed part of the pension benefits. In 2014, this ceiling was EUR 285, but starting from 2015 the indexed part of the pension benefit is, as described, not higher than 50% of previous year's average contribution wage. Exemptions are applied to disabled persons and for politically repressed persons and for liquidators of the Chernobyl nuclear disaster. The pension benefits of these groups are indexed completely.

The mandatory public pension system also provides for disability pensions and survivors pensions (EU, 2020b). Persons whose disability has been caused by an accident at work or an occupational disease are not affected by the regulation on disability pensions. They are entitled to indemnity payment compensating for the loss of the work capacity.

Disability pensions

Persons, with an insurance record of at least 3 years and who have been recognised as being disabled, are entitled to a disability pension (MISSOC). The eligibility to invalidity benefits (*"Invaliditātes pensija"*) is related to the degree of capacity/incapacity. Disabled persons are categorised into three groups of disabilities with a grading from 3, corresponding to the least severe form, to 1, corresponding to the most severe form of invalidity. The assessment is made by a Health and Working Capacity Medical Expert Commission.

For disabled persons of the least severe 3rd category, the benefit is fixed to a calculation basis (*"invaliditātes pensijas aprēķina bāze"*). This is EUR 136 in 2023 according to MISSOC (updated 1 January 2023). For persons suffering from disabilities since childhood the amount is 163 EUR per month. For disabled persons in categories 1 and 2 benefits are calculated by considering the person's individual reference earnings and insurance history. The benefit amount decreases with less earnings and shorter employment history. However, a guaranteed minimum is guaranteed for disabled persons in these two categories. This equals the invalidity pension basis of currently EUR 136 multiplied by 1.4 in case of a category 2 and multiplied by 1.6 in case of category 1. Disabled persons who have reached the statutory retirement age are granted the old-age pension, instead of disability pension. If the amount of old-age pension is lower than the disability pension amount, people continue to receive the higher disability pension amount (EU, 2020b).

Disabled persons who are not entitled to a state disability pension may receive the state social assistance benefit. Since 2020, the amount of the state social security benefit for persons with disability in general case was set at EUR 80 per month, for disabled persons since childhood the corresponding benefit is EUR 122.7. In case of category 2 disability, the standard benefit raises to EUR 96 and in case of category 3 to EUR 104 respectively.

Survivors' pensions

According to the Ageing Report country fiche information (EU, 2020b) there are no widows' pensions, except from entitlements from the old-pension system prior to the introduction of the

NDC scheme in 1996. Widows entitled to pensions according to the old pension system, continue to receive those during a transition period. These pensions are paid from a state pension special budget.

Family members, primarily children under the age of 18, who are incapable of work and who are dependent on a deceased insured person are entitled to a survivor's pension. Persons are also considered incapable of work if, at the time of the death of the insured person or later, they are full-time students and are aged below 24.

The survivor's pension depends on the insured person's pension entitlements and insurance record. The survivor's pension is calculated by considering the possible old-age pension from the deceased's own pension entitlements: for one child the pension equals 50% of the possible pension entitlement, for two children the corresponding value is 75% and for three and more children it is 90% respectively. The government sets minimum limits depending on the age and/or a corresponding disability status of the children.

2.8.3. Public scheme fiscal challenges

The Latvian public pension system seems “affordable” and “financeable” from the viewpoint of public spending. Public spending on pensions currently stands at just over 7% of GDP and is expected to further declines, according to the calculations of the Aging Report. This must be seen against the rather modest generosity of the Latvian public pension system. The total benefit ratio of 23 is not only the lowest among the 11 countries considered here, but the already low benefit ratio is expected to decrease further to about 18 and 17 in 2040 and 2050, respectively (Table 18). The already low and still decreasing benefit ratio is seen as the main driving force of decreasing public pension expenditure (EU, 2020b). The constant decrease of the benefit ratio over the projection period of the Ageing Report is also a consequence of the transition of financing mechanisms from a PAYG NDC system to a funded system. Public provision of pension benefits decreases while the private mandatory part increases.

Forecast of public expenditure

As mentioned, public spending for pensions is rather moderate from the viewpoint of an international comparison. Currently, public pension spending is 7.1% of GDP, expected to further decrease to 6.6% in 2040 and 6.2% in 2060 respectively (Figure 38). In almost no other of the countries considered in this report public pensions spending is on such a low level.

Figure 38: Latvia: Forecast of public expenditure on pensions (in % of GDP)

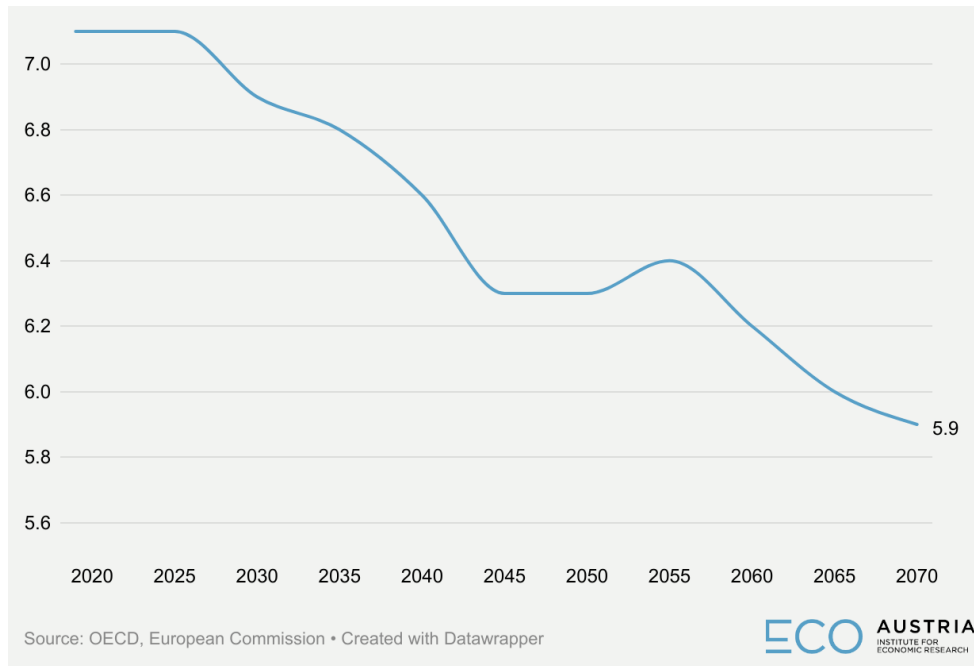
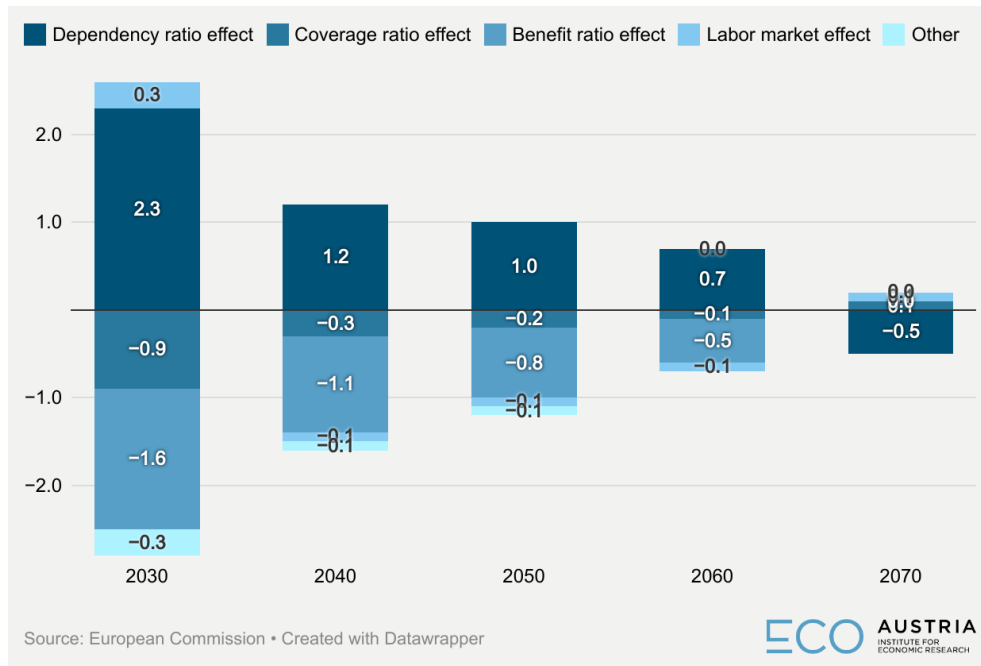


Figure 39 shows the contribution of the various determinants public pension expenditure. As mentioned, overall pension expenditure is expected to increase over the projection timespan in the Ageing Report. The main force explaining this development are decreasing benefit ratios and thus a negative benefit ratio effect on public expenditure. Without any institutional reforms raising dependency ratios due to negative net migration and low fertility would lead to increasing spending levels of cumulatively 3.4 percentage points of GDP up to 2040 and 4.4 percentage points up to 2050 respectively. A decreasing benefit ratio effect is expected to offset most of the spending increase due increasing dependency ratios. The benefit ratio effect will cumulate to -2.7 up to 2040 and -3.5 up to 2050 respectively. Some of the offset is expected to arise also from increases in the retirement age and indexation rules. Gross public pension expenditure declines by 1.2 percentage points of GDP over the projection period up to 2070. On the other hand, mandatory private pension expenditures within the scope of the FDC system will increase by 2.2 percentage points.

Figure 39: Latvia: Components of change in the public expenditure



Forecast of benefit ratios and replacement rates

With the overall pension system is transitioning from an NDC-system to an FDC-system the benefit ratios provided within the scope of the public mandatory NDC-system are expected to decline (Table 18). The total benefit ratio is projected to decrease from 23 to 18 in 2040 and 17 in 2050 respectively. Accordingly, benefit ratios under the public NDC earnings related scheme will fall from 26 in 2019 to 16 in 2050.

Table 18: Latvia: Benefit ratio and replacement rates until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Public scheme (BR)	23%	20%	17%	15%	13%	13%	-9.0
Public scheme: old-age earnings related (BR)	26%	22%	18%	16%	14%	14%	-11.0
Private occupational scheme (BR)							
Private individual schemes (BR)							
Total benefit ratio	23%	20%	18%	17%	17%	19%	-4.0
Total replacement rate	56%	42%	34%	32%	31%	30%	-25.0

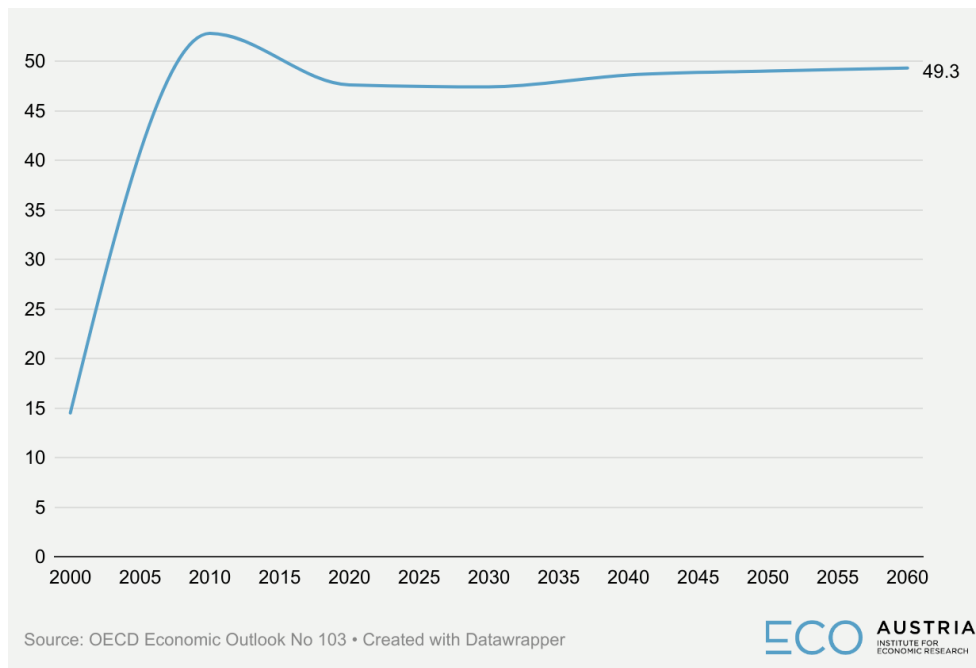
Source: European Commission • Created with Datawrapper

Forecast of the debt levels

Consolidated gross public debt in 2022 was at about 40.8% of GDP, according to Eurostat. This is distinctively below the EU 27 average (84%), corresponding to the 7th lowest debt ratio among the EU27 Member States. According to OECD, general government gross financial liabilities will stay constant, marginally increasing from 48% of GDP in 2020 to 49% in 2040. Given the expected

decline of public pension expenditure no further fiscal pressure from public pension financing is expected for Latvia.

Figure 40: Latvia: Projection of long-term gross financial liabilities (in % of GDP)



To assess the sustainability risk on public finances and budgets, the DG for Economic and Financial Affairs developed the sustainability gap indicators. The results indicate a low mid-term and long-term sustainability gap risk for public finances and public debt in Latvia. The mid-term sustainability risk is measured by the so-called S1 indicator. This indicator measures the required fiscal adjustment to bring the government debt-to-GDP ratio to 60% in the mid-term up to 2038. With -0.9% Latvia is assessed into the group of low-risk countries, together with Poland, Ireland, Bulgaria, Lithuania, Estonia, Luxemburg, Denmark and Sweden. As regards the mid-term risk for Latvia the European Commission concludes: “Over the medium term, fiscal sustainability risks are low overall, both according to the sustainability gap indicator S1 and from a debt sustainability analysis (DSA) perspective” (DG ECFIN, 2022, p. 27).

The long-term risk assessment is based on the S2 fiscal gap indicator. The S2 indicator measures the fiscal adjustment required to stabilise government debt in the long term up to 2070. Also, the long-term risk for Latvia is assessed as low. Latvia is part of a long-term low-risk group together with four other countries, namely Denmark, Estonia, Lithuania, and Sweden.

2.8.4. Funded pension

Mandatory FDC scheme

As mentioned above, in 2001 a mandatory FDC scheme was launched to replace the public NDC system. The scheme is the standard compulsory pension scheme for all persons aged 30 and under in 2001. Since the system is mandatory for all employed persons born after 1971 and

persons born between 1951 and 1971 may join the scheme voluntarily, the system's coverage is high and reaches, at least partially, 100% of the working age population (OECD, 2023, p. 14).

As mentioned, those aged 30 to 50 in 2001 may join the system on a voluntary basis. The system is completely funded, with parts of the overall contribution rate of 20% dedicated for investment into pension assets. The share of contributions dedicated to pension savings is increasing as the NDC system is phasing out. Starting from 2016 the contribution rate to the funded pension scheme according to the Law on State Funded Pensions was set at 6% (EU, 2020b, Ageing Report country fiche for Latvia). At retirement there are two options. In each case, the accumulated capital must be converted to an income at retirement. Depending on the participant's choice the accumulated funded pension capital may be added to the NDC pension capital, and a total old-age pension is paid from NDC- and FDC-entitlements. As a second option, the funded pension capital may be used to "buy" a whole-life annuity from a life-assurance company. In this way the accrued capital is transferred to a lifelong annuity income, provided by the insurance company. Since 1 January 2020, pension capital can be inherited in case an insured contributor dies before retirement.

According to information from the IOPS country profile for Latvia, the mandatory FDC assets are managed by investment management companies. Eight such companies offer a total of 31 investment plans to participants. The organisation and administration of the overall mandatory FDC scheme is carried by the investment management companies together with the State Social Insurance Agency and custodian banks (IOPS 2019). Participants may change their asset management once a year and change an investment plan under the same management twice a year. Changes are free of charge. Insured participants are free to make a choice of investment plan and can choose a conservative investment plan, a balanced investment plan or an active investment plan. The investment policy of these plans varies mostly by the weight of equities, according to legislation from 0% to 75%. The default conservative fund is based on the State Treasury.

Pension assets in funded and private plans amounts 20.5% of GDP, according to OECD's Pension Markets in Focus (OECD, 2023). According to the country profile for Latvia from the International Organisation of Pension Supervisors (IOPS, 2019), Latvia's pension assets in the mandatory pension system totalled EUR 4,357 million. This shows the relative importance of the mandatory FDC component for funded pensions as a whole. According to the OECD data from Pension Markets in Focus, total assets in funded and private pension plans amount to EUR 5,075 million. Correspondingly, more than 85% of these assets refer to savings from the mandatory FDC system.

The importance of private and funded pensions in Latvia is reflected on the benefits side. The amount of total benefits paid from funded and private pension plans and assets transferred to third parties was 1.9% of GDP in 2021 (OECD, 2023, p. 26). Especially the third component of assets transferred to third parties is high, which is due to the institutional design of the mandatory FDC system. Upon retirement, insured persons decide whether the accumulated FDC capital is transferred to the state NDC system, which is administered by the State Social Insurance Institution, or to a private (life) insurance company, which pays a lifelong pension. With a benefit

volume of 1.9% of GDP, Latvia ranks 12th among 31 OECD countries considered. This underlines the importance and capacity that private and funded pension plans already have, even in the current transition phase.

Voluntary occupational or personal pension schemes

Since 1998, a standardized scheme for voluntary occupational or personal pension savings exists (Ageing Report country fiche for Latvia, EU, 2020b). Its purpose is to accumulate and invest the contributions of its participants by means of private pension funds thus ensuring additional pension capital in old age. Pension plan participants may participate personally or occupationally, with the involvement of their employer. The pension plan participants can receive all accumulated pension capital from the age of 55 or continue participating and receive capital in parts. According to the International Organisation of Pension Supervisors (IOPS, 2019) country profile²⁸ for Latvia voluntary occupational or personal plans may take the form of DC-plans, DB-plans or might be designed as DB/DC-hybrid.

According to the IOPS (2019) for Latvia the contribution rates for voluntary occupational or personal plans are not prescribed by law. Regarding occupational plans employers typically contribute between 5% and 10% of the employee's salary, while employees contribute around 5%.

As shown above, assets in funded and private pension plans mainly refer to the mandatory FDC system. According to the IOPS 2019 country profile for Latvia, voluntary pension assets amounted to EUR 526 million in mid-2019. Compared to a volume of EUR 4,375 million assets in the mandatory FDC scheme by 2019 this represents only about 12% of total assets in funded and private pension plans. In this respect, voluntary funded pension provision is less relevant than mandatory FDC saving in terms of total assets. However, according to the 2022 OECD Pension Markets in Focus report, the coverage of voluntary private pensions is quite high (OECD, 2023, Figure 1.6). With 24.1% of the working age population covered by voluntary personal pension plans, Latvia ranks 9th out of 33 countries considered by the OECD. The comparative value for Austria, for example, is 16.5%.

Investment regulations

As regards mandatory FDC pensions legislation sets both quantitative and qualitative investment restrictions (IORPS 2019). Assets might be invested in government and municipal securities, corporate debt and equity securities, open-ended investment funds, bank deposits, alternative investment funds (AIF), risk capital and derivatives. There is no maximum limit to investments abroad, provided they are listed on the official list of stock exchanges registered in a Baltic, EU or EFTA countries. The law restricts investment into foreign currencies and does stipulate a 70% currency matching rule. Furthermore, assets may not be invested directly into real estate. Managers are permitted to take loans with the assets. Investments in risk capital markets are also limited to 5%.

²⁸ The Latvian country profile is downloadable from the IOPS website under the [Weblink](#).

As regards voluntary occupational or personal plans, pension funds that provide only pure DC pension schemes are, by law, not allowed to manage assets of pension plans by themselves but should contract out the asset management of the pension plans to external asset managers. According to the law credit institutions, life insurance joint stock companies, investment brokerage companies and investment management companies which are allowed to provide services in Latvia can be contracted as the asset managers of pension plans. Investment rules are largely the same for DB and DC schemes. There are no restrictions on switching funds: a written application sent to the pension fund one month in advance suffices (IOPS 2019 for Latvia). Fees are unregulated. Private pension funds charge their fee for administration of pension plans. There are also fees to asset managers and custodian banks and may be charged other fees, too.

Assets allocated

According to Pension Markets in Focus (OECD, 2023, p. 11), the total volume of assets in funded and private pension schemes was 20.5% of GDP in 2021, or EUR 6,744 billion. This includes pension savings under the mandatory NDC scheme and under voluntary individual and occupational plans. As mentioned above, the by far larger share of assets is related to the mandatory NDC scheme. In an international comparison, the share of total assets relative to GDP corresponds to a medium level among all 38 OECD countries considered. Latvia ranks 22nd among 38 countries considered in OECD's Pension Markets in Focus publication. Latvia also belongs to the OECD countries with the highest growth rates of pension assets. This is also due to the aforementioned transition of the mandatory pension scheme from a PAYG NDC scheme to an FDC scheme. Between 2001, when the new mandatory FDC scheme was introduced, and 2021 total assets increased at an annual nominal growth rate of 33.1%. This corresponds to the 3rd highest growth rate among 31 countries.

Pension assets in Latvia have a highly internationalised investment structure. More than 90% of assets are invested abroad. According to Pension Markets in Focus (OECD, 2023, p. 36), this is the highest share among 27 OECD countries compared. However, at 97.7% only Malta has a higher share among EU Member States. The high degree of internationalisation of investment of pension assets may have also structural economic causes (OECD, 2023, p. 36). According to the OECD, countries with the highest proportion of pension assets invested abroad are typically European countries that themselves have only small capital markets. Simultaneously with the transition of the mandatory pension system from NDC to FDC, the funded elements of the pension system are becoming increasingly important for Latvia. Against the background of the economic catching-up process that is still taking place, the capital market is still relatively small to be able to bear the growing importance of funded pension financing on its own.

For the risk analysis, the current Russian crisis is particularly significant for pension providers in Latvia. Historically, the Russian market has been attractive and important for Latvian pension providers. As recently as 2013, almost 2% of Latvian pension providers' assets were invested in Russia. From that peak, Latvian assets invested in Russia declined to almost 0% in 2021.

The investment structure of pension assets is focused by bonds and bills, according to OECD's Pension Markets in Focus 2022 (OECD, 2023, p. 31). With 52% of total assets invested in bills

and bonds in 2021, Latvia has the 11th highest share among the 38 OECD countries compared. Investment in equities accounts only for 41.5%, distinctively below the comparative values for the other Baltic countries Estonia (59%) and Lithuania (74.6%).

Investment performance

Funded pension assets performed rather poor in 2021. The real rate of return on investment was at -0.2%, according to OECD's Pension Markets in Focus (OECD, 2023, p. 28). This is also due to the recent difficult market environment in 2021. In 2021, the average real RRI among OECD countries was 3%. However, the performance of Latvian providers is still beneath this average. For some of the bigger pension markets pension plans may have benefitted from buoyant stock markets in 2021, continuing their recovery after the drop in early 2020. However, this is not the case for Latvia. While total pension assets still increased in Latvia in nominal terms, with EUR 6.7 billion in 2021 compared to 5.7 in 2020, an average nominal investment rate of return of +7.7% in 2021 was not sufficient to offset the pressure from raising inflation. At this stage, a notably weak performance nevertheless appears to be a temporary phenomenon. In 2019, the real RRI was still 7.4%, in 2020 it was 2.8%. On a 10-year average, the real rate of returns was 2%. However, even the more favourable mid-term average seems rather low, compared to other OECD countries. The comparative value was 3.9% for instance in Lithuania.

Tax treatment

Different tax rules apply to the mandatory FDC scheme and to voluntary pension schemes, also depending on whether they are set-up in an occupational or personal form. However, the mandatory FDC scheme is regarded by OECD as the main scheme for funded pensions in Latvia (OECD, 2022b, S. 7). This applies in terms of both total assets and coverage as well. In simplified terms, an EET regime applies for this main scheme (Table 19). Correspondingly, ETT regimes apply to voluntary pension plans.

According to OECD's report on tax incentives for retirement savings (OECD, 2022b, p. 68), the EET-form applies to mandatory FDC pensions: Contributions to funded pension plans are fully tax exempt. Returns on investments are not taxed, but pension income from mandatory state funded pension plans is treated as ordinary income and taxed at the individual's income tax rate.

As regards voluntary personal or individual pensions contributions are tax deductible up to a limit of 10% of the individual's annual taxable income. A joint limit for contributions to voluntary pension funds and insurance premiums may not exceed 10% of the individual's annual taxable income, up to EUR 4,000. As regards voluntary occupational plans employer contributions are counted as income to the employee and are also deductible within the mentioned limits.

Table 19: Latvia: Taxation regime for funded pensions

Taxation regime for funded pensions in Latvia				
	Source of contribution	Contributions	Returns	Withdrawals
Mandatory FDC (Main scheme)	Individual	E	E	T
Voluntary personal funded	Individual	E	20%	20%
Voluntary occupational funded	Employer	E	20%	T

Quelle: OECD (2022). Annual survey on financial incentives for retirement savings. • Erstellt mit Datawrapper

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Income from investment returns is considered as income from capital other than capital gains and taxed at a flat rate of 20%. For pension income from voluntary pensions different rules apply: Pension income formed from contributions made by an employer (on behalf of an employee) into private pension funds is taxed at the individual's marginal income tax rate.

Consistent with OECD, contributions to mandatory FDC plans are tax deductible, according to IOPS (2019). Returns on investment are exempt from tax as regards the mandatory FDC scheme, whereas pension benefits are taxed at the ordinary income tax rate. (IOPS, 2019, 3). As regards voluntary plans, employer contributions are tax exempt up to 10% of the employee's annual employment income.

2.8.5. Highlights and features of the system

1. Strengths and weaknesses (according to Overall Pension Index – OPI)
<ul style="list-style-type: none"> - The Latvian pension system ranks top regarding “Sustainability” (with an OPI score of 0.99 and ranked 1st among 11 countries). However, the pension system is not very generous and provides only moderate pension levels. Latvia shows potential for improvement as regards “Adequacy” (OPI score 0.14, ranked 11th among 11). The system is characterized by a variety of NDC-PAYG- and funded elements. Only basic elements are PAYG, the overall pension system therefore appears affordable and sustainable, but not very generous.
2. Tax treatment
<ul style="list-style-type: none"> - 2nd tier mandatory FDC scheme: EET; 2nd tier voluntary occupational schemes: ETT; 3rd tier voluntary personal schemes: ETT.
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - The overall social insurance contribution rate for the mandatory occupational pension schemes (NDC plus FDC) is 20% of the gross wage. Contributions are paid half by the employers and half by the employee. The share dedicated for the funded FDC scheme increases during the transition period from the PAYG NDC scheme to the FDC scheme. Starting from 2016 the contribution rate to the funded pension scheme according to the Law on State Funded Pensions was set at 6%.
4. Asset Allocation
<ul style="list-style-type: none"> - In the year 2022 according to OECD: Equities (41.5%), Bills & Bonds (52.0%), Cash & Deposits (3.1%), Other* (3.5%) <p><small>* Assets invested in loans, real estate (land and buildings), unallocated insurance contracts, private investment funds and other alternative investments.</small></p>
5. Obligatory character
<ul style="list-style-type: none"> - The earnings-related second-tier system combines a contributory public scheme, based on notional accounts (NDC) and a mandatory funded component (FDC). Currently the system is transitioning to a mandatory FDC scheme. - The FDC scheme is the standard compulsory pension scheme for all persons aged 30 and under in 2001. Persons born between 1951 and 1971 may join the scheme voluntarily.
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - The accrued capital from mandatory FDC plans must be converted into a permanent income stream. Dependent on the insured’s choice the capital can either be transferred into the public NDC scheme or used to “purchase” a lifelong annuity from an assurance company.
7. Contributions to funded plans as percentage of GDP
<ul style="list-style-type: none"> - According to OECD Pension Markets in Focus 2022 (OECD 2023) the volume of contributions to all forms of funded schemes was 4.5% of GDP in 2021.
8. Investment performance
<ul style="list-style-type: none"> - 10-year average investment rate of return 2011-2021 according to OECD: 1.9% - At the same time the OECD average was 3.7%.

Additional information and results

- The Latvian pension system corresponds to an integrated three tier model with a mandatory NDC component and an FDC component combined in the 2nd tier. The mandatory 2nd tier occupational system is currently transitioning from the public NDC system to an FDC system.
- The 1st tier provides for minimum pension income for persons who have reached the eligibility age and with an adequate insurance record. Minimum income for pensioners is reached in combination with social assistance benefits.
- Latvia is strongly affected by the increasing old-age dependency ratios. However, sustainability risks for public financing are low. This is due to decreasing benefit ratios and a stable and moderate public debt rate.
- The overall pension system is assessed as highly sustainable. A disadvantage shows regarding adequacy. The statutory public pension system provides only moderate pension levels, also due to the current transition from a PAYG NDC system to an FDC system.
- To ensure adequacy, it is envisaged that declining benefit ratios from the statutory PAYG NDC scheme will be compensated by an increasing relevance and capability of the FDC system. However, currently the assets accumulated in funded occupational pension plans are increasing, but still low compared to GDP.

2.9. Netherlands

2.9.1. Demographic profile and demographic forecast

According to the demographic forecast for the Netherlands (Table 20), the population will grow moderately but steadily until 2040. The population increase will be mainly due to positive net migration. After peaking at about 18.2 million people in 2042, the population will remain constant at around 18 million. The age structure of population will shift drastically towards older people, with an old age dependency ratio – viewed at as the ratio of the population with 65 years and above divided by the population from 20 to 64 years of age – increasing from 33% in 2019 to 49% in 2050 and 55% in 2070. Already by 2030, the dependency ratio will increase by almost 10 points, and by another almost 7 points between 2030 and 2040.

Table 20: Netherlands: demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	17,343	17,988	18,188	18,136	18,010	17,990	
Population growth rate	0.6	0.2	0.0	-0.1	-0.1	0.0	
Old-age dependency ratio (pop 65+ / pop 20-64)	32.9	42.4	49.3	49.3	51.4	55.2	
Old-age dependency ratio (pop 75+ / pop 20-74)	11.8	17.0	21.9	24.9	24.2	26.3	
Ageing of the aged (pop 80+ / pop 65+)	24.2	29.2	33.4	40.8	39.4	39.4	
Men - Life expectancy at birth	80.7	81.9	83.2	84.4	85.5	86.6	
Women - Life expectancy at birth	83.6	85.1	86.4	87.6	88.8	89.9	
Men - Life expectancy at 65	19.0	19.9	20.9	21.8	22.7	23.5	
Women - Life expectancy at 65	21.4	22.5	23.5	24.5	25.4	26.3	
Men - Survivor rate at 65+	89.6	91.2	92.4	93.4	94.2	95.0	
Women - Survivor rate at 65+	92.3	93.6	94.5	95.3	96.0	96.6	
Men - Survivor rate at 80+	63.1	67.9	71.8	75.3	78.5	81.2	
Women - Survivor rate 80+	74.0	78.0	81.3	84.0	86.4	88.5	
Net migration (thousand)	105.4	33.3	34.0	33.4	32.8	33.2	
Net migration over population change	0.9	0.9	5.8	-2.9	-3.3	9.0	





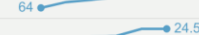
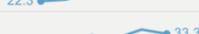
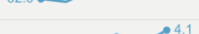
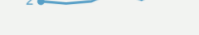
Source: European Commission • Created with Datawrapper

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The “ageing of the aged” indicator, indicating the relationship between over 80-year-olds to persons aged 65+, will increase from 24.2 in 2019 to 40.8 in 2040 due to increasing life expectancy. This will put further funding pressure on other social policy expenditure such as long-term care and public health. Male life expectancy at 65 is expected to increase from currently 19 years to 23.5 years in 2070. For women life expectancy at 65 will increase from currently 21.4 years to 26.3 years in 2070. Accordingly, remaining life expectancy from 65 years is going to increase by 4 ½ years for men and by almost 5 years for women respectively. Summing up, the demographic forecast for the Netherlands indicates moderate population growth and, at the same time, intensive aging dynamics.

Unlike in Austria, for example, the retirement age in the Netherlands is continuously adjusted to rising life expectancy (Table 21). The average effective retirement age will rise continuously and automatically for both men and women, based on a legally anchored mechanism that links the eligibility age for statutory pensions to rising life expectancy. For men, the average effective retirement age will rise from currently 65.8 years to 67 years in 2040 and further to 67.6 years in 2050 and 68.1 years in 2060. For women, the average effective retirement age will rise from currently 64 years to 65.4 years in 2040 and further to 65.9 years in 2050 and 66.4 years in 2060.

Table 21: Netherlands: Exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labour market exit age (CSM) - Men	65.8	66.6	67.0	67.6	68.1	68.5	
Duration of retirement - Men	18.2	18.3	19.2	19.3	20.1	20.0	
Percentage of adult life spent in retirement - Men	27.6	27.4	28.1	28.0	28.6	28.4	
Early/late exit - Men	1.1	1.1	1.2	1.7	1.2	2.3	
Average labour market exit age (CSM) - Women	64.0	65.0	65.4	65.9	66.4	67.0	
Duration of retirement - Women	22.3	22.5	23.5	23.6	24.5	24.5	
Percentage of adult life spent in retirement - Women	32.6	32.4	33.2	33.0	33.6	33.3	
Early/late exit - Women	2.0	1.7	2.0	3.5	2.2	4.1	

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

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The development of the average effective retirement age for men and women is a result of an automatic adjustment of the eligibility age for statutory old-age pensions. As mentioned, this is based on an institutionally anchored adjustment formula for the age of entitlement to a public old-age pension. Furthermore, the eligibility age for second tier occupational pensions is linked to the eligibility age for statutory pensions. The eligibility age for the first-tier statutory pension, called AOW-pensions referring to the corresponding legal act, used to be 65 ever since its introduction in 1956/1957. In 2024 it will be 67 years, according to the Dutch country fiche information for the EU Ageing Report (EU, 2020a). After that year, the eligibility age will be linked to institutional adjustment mechanism mentioned above.

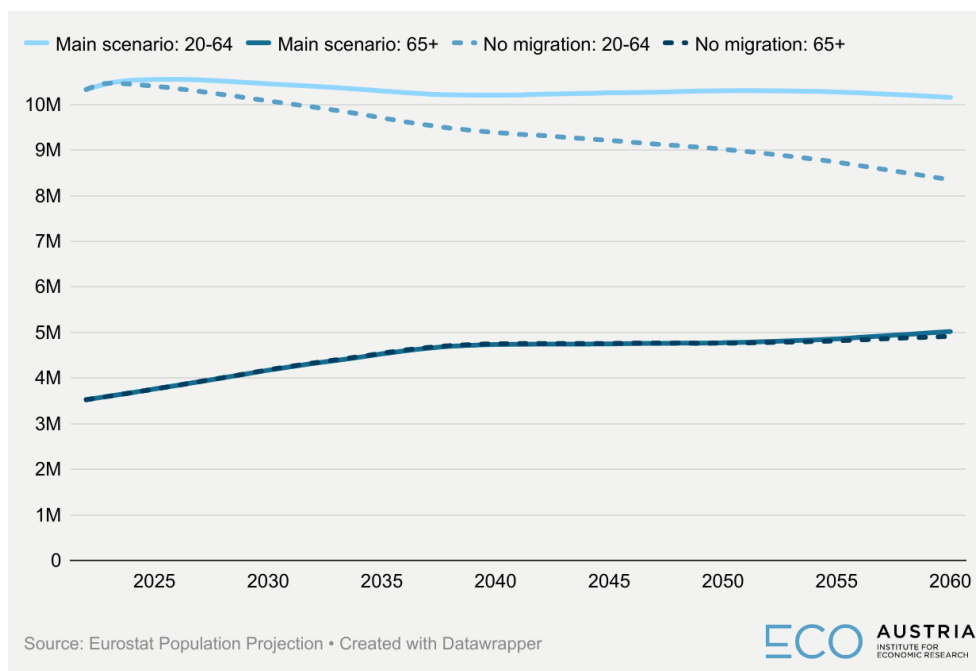
The role of migration

Migration partially compensates for aging, when immigrants have a younger age structure compared to the resident population. However, according to the Ageing Report the Netherlands already has high net immigration, of around 100,000 people per year (Table 20). In the projection period up to 2070, average annual net immigration is expected to develop constantly at about 33,000 persons. However, stagnating migration will put additional upward pressure on age-dependency ratios. Given the assumptions from the demographic projection and assuming the same age-structure and fertility between migrant and resident population, the size of migrant population necessary to hold old-age dependency ratio constant from 34.1 in 2022 (Figure 42)

would be 6 million people in 2060. Assuming an old-age-dependency-neutral migration, average annual net migration would have to exceed by far the levels projected within the scope of the Ageing Report. This is particularly true for the period up to 2030 and beyond to 2040, when average annual net migration would have to be 270,000 and 240,000, respectively, to keep the old-age dependency ratio at the 2022 level of 34.1.

At the levels projected in the Ageing Report, migration in the Netherlands has still a significant relevance to at least partially compensate for the ageing of society. The impact is shown in Figure 41 and Figure 42. Whereas migration has hardly any relevance for the older population with 65 years and more, migration leads to an increase of the working age population from 20 to 64 years. Without migration the working age population from 20 to 64 years would be smaller by about 820.000 people in 2040 and by 1.28 million of people in 2050 respectively. For 2040, the main population projection base-scenario results in a population size of 10.2 million people aged 20 to 64. Without migration, the corresponding figure is only 9.38 million people. The situation is similar in 2050. With migration, the population aged 20 to 64 will be 10.3 million people, compared with 9 million without migration. As shown in Figure 41, immigration can at least compensate for a decline in the working-age population, while it cannot ensure a constant old-age dependency ratio due to the increase in the elderly population.

Figure 41: Netherlands: demographic forecast with and without migration (2022-2060)²⁹

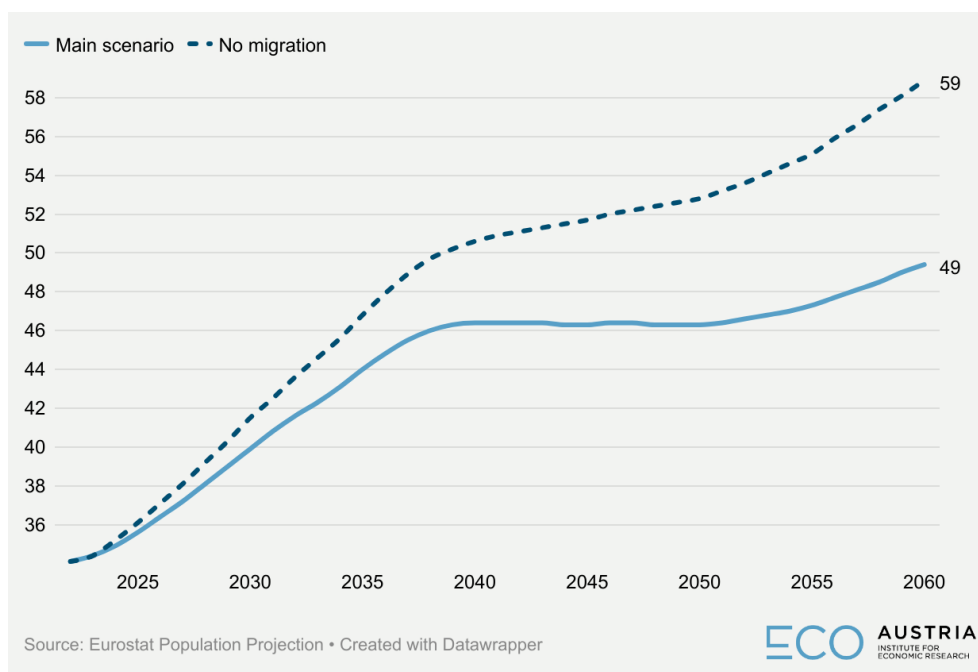


In summary, migration offsets some of the ageing pressure on working age population and has a mitigating though not completely offsetting effect on the increase of old-age dependency ratios (Figure 42). Without migration the dependency ratio would be 50.6% in the year 2040, whereas

²⁹ The corresponding data for this section is taken from the population projection, published by Eurostat under the data code „PROJ_23NP“. The values might differ from those in the ageing report.

with migration the dependency ratio improves to 46.6%. In 2050 the dependency ratio would raise up to 52,8% without migration, while migration will dampen the increase to 46.3%.

Figure 42: Netherlands: old-age dependency ratio (65+/20-64) in the main scenario and without migration



2.9.2. General architecture

The Dutch pension system mainly consists of three major pension tiers, comprising:

- statutory pensions, which provide universal flat-rate pensions (first tier) that depend on age, residence and the length of the insurance record in the Netherlands,
- mandatory or at least quasi-mandatory³⁰ occupational pensions that are based on funded pension plans laid down in most collective industrial agreements (2nd tier),
- voluntary individual pension plans (3rd tier).

The 1st tier is a flat-rate statutory state pension based on a General Old-Age Pensions Act (“Algemene Ouderdomswet” or AOW). The basic AOW old-age pension provides an equal minimum income for all pensioners at a level related to the net minimum wage. From July 1st, 2023 this gross amount was EUR 1,458 for a single person (Better Finance 2023). Each year of insurance, persons insured build up an entitlement of 2% of a guaranteed basic pension benefit. Basic AOW pensions are financed on a PAYG basis, via social insurance contributions and taxes. The additional 2nd and 3rd tier provide funded occupational pension schemes and respectively individual saving schemes. In the Ageing Report's country fiche information for the Netherlands the mandatory part of the Dutch pension system is described as comprising the government provided AOW basic old-age pension scheme (1st tier), occupational pension schemes (2nd tier)

³⁰ Occupational pension schemes and their form are regulated in most collective agreements.

and, as a part of public provision of basic social security, disability benefits and survivor benefits. However, this is only partially correct, as the occupationally funded pension schemes are not, strictly speaking, mandatory. There is no statutory obligation for employers to offer a pension scheme to their employees. However, an obligation to provide occupational pension plans is laid down in most collective industrial agreements for at least most of the employees in the Netherlands. Approximately 90% of employees are covered. Thus, these schemes are often described of as being “quasi-mandatory”, but still for a relevant share of employees in companies that have fewer than ten employees (Kemna et al. 2011, 28) and for the self-employed there is no mandatory occupational pension insurance. Furthermore, the self-employed must arrange their supplementary pension themselves. They can do this in the form of 3rd tier individual insurance policies.

The 2nd tier comprises the occupational pension schemes. These schemes are all funded and laid down in the agreements on industrial relations, thus being quasi-mandatory for most employees. In principle there are three types of second-tier occupational pension funds in the Netherlands. The first is the industry-wide or sector-wide pension fund, organized for a specific sector of industry (e.g., construction, health care, or transport). Participation in an industry-wide pension fund is mandatory for all firms operating in the sector. A corporation can opt out only if it establishes a corporate pension fund that offers a better pension plan to its employees than the industry-wide fund. Where a supplementary pension plan exists, either as a corporate pension fund or as an industry-wide pension fund, participation by workers is mandatory and governed by collective agreements. The third type of pension fund is the professional group pension fund, organized for a specific group of professionals such as physicians or notaries.

Funded occupational pensions play an important role in the Dutch pension system. They are an integrated part of the architecture of the overall pension system and have not only supplementary character. The function of career- and earnings-related provision of pension benefits is provided by occupational pension funds. This is a significant difference to the more social-insurance based PAYG systems that exist in Austria and Germany. Here, the public PAYG system assumes the function of securing the standard of living, while funded 2nd and 3rd tier pension plans have a supplementary character. They supplement state pensions and are related to past contributions and previously earned income. According to OECD’s Pension Markets in Focus currently pension plans are currently shifting from defined benefit schemes to defined contribution schemes. This transition is likely to continue, driven by the introduction of a new pension agreement between the government and the employers’ and employees’ associations for occupational pension systems turning the occupation pension contract more into a DC system rather than a DB system³¹. The new occupational pension contract should be used in practice from 2026 onward. However, DB are still dominating the landscape of occupational pensions according to the EIOPA occupational pensions statistics. Thus, the total volume of assets in funded DB plans was 1,8 billion of EUR in 2021, compared 22 million in DC plans.

³¹ For information see information from the Dutch government under the [Weblink](#).

Qualifying conditions

The first statutory pillar is universally covering all persons living in the Netherlands. According to MISSOC³² the 1st pillar pension system corresponds to a social insurance scheme for all residents financed by tax-related premiums on earned incomes on a PAYG basis and additional financing through taxes. The main qualifying conditions for receiving state pensions are thus residency in the Netherlands and having reached the eligibility age.

Current and future retirement age

Eligibility to a basic old-age pension is linked to the age of inhabitants. In 2020, the basic old-age pension was payable from the age of 66 years and 4 months. In 2023, the eligibility age is 66 years and 10 months, according to MISSOC. The statutory pension age is gradually increasing to 67 in 2024. Thereafter, the standard retirement age will increase automatically according to gains in life expectancy. Eligibility ages for first statutory pillar pensions and for second pillar occupational pensions are linked. It is possible to withdraw from the occupation pension earlier before reaching the eligibility age. However, the benefits are adjusted. It is not possible to defer the basic old-age pension scheme after having reached the eligibility age. But it is possible to combine the basic pension benefit receipt and continue working.

First-tier pensions

The basic pension provides for a standard benefit. The system generally covers all residents. The amount of the pension entitlement is, however, based on contribution periods or episodes. People who work in the Netherlands and pay taxes on their earned income are insured regardless of their place of residence. The benefit amount is adjusted biennially in line with the development of net minimum wages.

The basic pension benefit for a single person equalled about EUR 1,230 per month in 2020 (see OECD, 2021d). There is an additional holiday allowance. It amounted to about EUR 72 per person in 2020 resulting in a total benefit equal to about EUR 1,300 for singles and about EUR 1,770 for couples. The basic benefit accrues at 2% of the full value for each year a worker lives or works in the Netherlands. To reach the full basic benefit a person must live and work in the Netherlands for 50 years. For older people and/or households with less than 50 years of residency and economic activity and with no other means of support or no assets there is a means tested social-assistance scheme available (OECD, 2021d). The social assistance scheme supplements the benefits from basic and occupational schemes to a maximum value equal to the net basic pension.

The basic old-age pension benefit is conditional on a full lifetime employment record. The basic pension aims at an equal income for all pensioners at a level related to the net minimum wage. Supplementary benefits for dependents and spouses are laid down in a transitional law from 2015. To qualify for the supplement, the partner's income should not be higher than EUR 1,600 gross

³² The Mutual Information System on Social Protection (MISSOC) provides information on social protection systems and their organisation in the 27 Member states of the European Union, the three countries of the European Economic Area – Iceland, Liechtenstein and Norway – as well as the UK (up to 1st July 2019) and Switzerland. The information is updated continuously, at least once a year. The data tables are published at the [Weblink](#) and can be downloaded there.

per month. If the combined income of the partners is higher than EUR 3,070, the supplement will be lowered by maximum 10%. Each person entitled to AOW receives an income support benefit, "*inkomensondersteuning AOW*" of about EUR 5 gross per month, when the person has a complete insurance record.

People who move abroad from the Netherlands are entitled to voluntary insurance for a period of maximum ten years after they have moved abroad. For this option people must have lived in the Netherlands for at least one year and must apply for this voluntary insurance within one year after moving abroad.

Persons who have reached the eligibility age for a basic state pension (AOW) but do not receive the full pension benefit, for instance due to insurance gaps and interruptions, might be eligible to supplementary social assistance related payments, the so called AIO supplement. The AIO supplement is an income support benefit for people of AOW pension age but who are not entitled to a full AOW-pension. The means-tested AIO supplement provides for the guaranteed minimum income. To qualify for an AIO supplement, the total value of income and assets must be below a certain level. Benefits from a second pillar occupational scheme or from an individual pension scheme are considered.

The first-tier public pension scheme also provides for survivor benefits. This scheme covers widowers, widows and orphans (Ageing Report Country Fiche for the Netherlands). The benefit level has a maximum of 70% of minimum wage. This level applies only to individuals with no income from labour. In net terms it equals the social assistance level. In case the involved individual has income from labour, the benefit is reduced by a level that equals 50% of minimum wage plus two thirds of the surplus of labour income. Possession of personal wealth or incomes from pensions do not lead to a reduction of the benefit.

The first-tier statutory pension system comprises disability or invalidity benefit schemes. Three schemes are relevant. The new WIA scheme, the old WAO scheme for disabilities before 2004 and the Wajong scheme. WAO and WIA are social security schemes. They are financed by social security contributions paid by employers. Wajong is financed by general taxation. Wajong covers especially people with a low employment record. The level of benefit is low and generally do not exceed those of social assistance. The WAO covers individuals who became disabled before 2004 and had past earnings. It involves a benefit that depends on past earnings, age and degree of disability. It can amount to a maximum of 75% of past earnings and is capped at around EUR 55,000 in 2019. WIA³³ is the current scheme to prevent from social risks of disability. Like WAO, the WIA scheme is a social-insurance scheme. Benefits are earnings-related and based on the difference between the previous wage and the social minimum. There are two arrangements, which depend on the degree and the prospect of duration of the incapacity for work. For people completely unable to work and with no prospect or only a small chance of recovery, it provides permanent income support in form of a full-invalidity benefit (IVA). The benefit covers up to 75% of the last wage (according to MISSOC) for person fully handicapped. Persons with the prospect

³³ The abbreviation WIA refers to „Wet Werk en Inkomen naar Arbeidsvermogen“, meaning Law on Income according to working capacity.

of recovery fall into the WGO “Return to Work” arrangement. The benefit amount depends on the degree of work incapacity. If the incapacitated person does not work at all it is 75% of the last wage during the first 2 months and 70% of the last wage afterwards. If a partially incapacitated person works, the benefit is 75% of the difference between the last wage and the current income during the first two months on top of the current wage. The benefit is reduced to 70% of the difference after the first two months.

As regards taxation, there is no special tax relief for pension income. However, pensioners over the age of 66 may claim a tax credit. The basic tax credit for persons above 66 years of age was EUR 1,413 in 2020 (OECD 2021d). This tax credit is increased by EUR 1,622 for income less than EUR 37,372. In addition, a pensioner in a single person household can receive a tax credit of EUR 436.

Pensioners pay 9.75% of taxable income for the general health insurance and survivors’ pensions (Wiz, ANW, up to an income of EUR 34,713 for 2020). Depending on their income, they pay for their own health insurance. The social security contributions are less than the contributions for those below the eligibility age for state pensions, who also must pay for old-age pensions and unemployment.

Second and third-tier pensions

Second tier pensions provide for quasi-mandatory funded pension plans based on collective agreements and mostly dependent on the employees’ profession. For second pillar pensions different institutional settings are relevant. Over 90% of these employees (2020) are covered by defined benefit (DB) schemes. The remaining employees are covered by a defined contribution (DC) scheme. As mentioned, occupational pensions are currently shifting from DB-based to more DC-based schemes. Defined contribution schemes are gaining in importance. This development will be further promoted by the introduction of a new pension agreement starting in 2026. At present, however, most occupational plans still have the character of funded DB schemes.

For the majority of DB contracts benefits are measured on the basis of lifetime average earnings, whereas less than 1% are based on the final salary or a combination of the two (OECD, 2021d). Final-salary schemes have a maximum accrual rate of 1.657% of earnings for each year of service. This equals a target replacement rate (excluding the AOW franchise) for most occupational pension plans of around 70% after contribution payments over a complete lifetime career. The maximum accrual rate for average salary schemes is 1.875% per year of service, which only covers earnings up to EUR 110,111 in 2020. Pension contributions for higher earnings will need to be paid with taxable contributions.

Although there is no legal uprating requirement, most occupational pensions in payment are raised on an annual basis. According to Pensions at a Glance for the Netherlands in 2020 nearly 28% of pensions in payment follow, mostly industry specific, wage growth, while some 65% of the pensions are indexed to prices and 1% aim for a mixture of wage and price growth.

Pension rights are fully transferable when individuals change jobs (OECD, 2021d). There is a legal requirement to index pension rights of people leaving a scheme before retirement in the same way as pensions in payment. Pension providers must ensure very short vesting times, when

people change their pension fund or administrator. When people change jobs, they can either transfer their pension capital to a new pension fund or administrator, or they can stay with the old pension fund. A transfer of pension capital is possible, but not always necessary, especially since many occupational plans are organised on an industry or sector level.

Most schemes use a target total replacement rate of 70% of final pay. This target rate is linked to the basic AOW state pension for the most occupational schemes: According to the Ageing Report's Country Fiche information, the AOW benefit is included in most calculations of occupational pension schemes to arrive at the overall 75% replacement aim in case of a complete lifetime career. This includes the corresponding factor in form of the so-called AOW franchise. In practice this means that occupational pensions do not accrue over the total wage, but the contribution base, which is the wage minus the AOW franchise. On average, pension contribution rates amount to 24% of gross income above this threshold, i.e. the contribution base, of which roughly 70% is covered by the employers and 30% by the employees. Together these two parts of the contribution to pension funds currently amount to around 14% of aggregate gross labour income.

This reveals a significant difference between occupational pension provision in the Netherlands and Austria. In the Netherlands, both the employer and the employee contribute to the funded pension system, whereas in Austria only the employer pays contributions. For employees in the Netherlands, occupational pensions are an important part of their overall retirement provision. The function of maintaining the standard of living is primarily provided by occupational pensions. Austria, for instance, there is a PAYG component that basically provides for income-based and earning-related benefits. In principle, this public pension component fulfils the essential function of maintaining the standard of living. It must be emphasized that there is no comparable function with regard to the Dutch PAYG component. The public AOW pension provides a standard basic benefit, depending on the length and continuity of the employment history and the insurance record. The function of maintaining the standard of living is largely provided by funded occupational pensions. The flat-rate nature of PAYG AOW system was a central arguing point for trade unions' political pressure to expand funded company pensions in the 1950s and 1960s (Chapter 2.2). After cost dampening policies led to substantial cuts in the generosity of AOW pensions in the 1980s and 1990s, losses were compensated for through the 2nd tier of funded occupational pensions. The overall replacement target remained constant for those employees who participated in an occupational pension scheme.

Despite the differences, there are also similarities: With the AOW system a public PAYG pension system was established in the post-war period in the years 1956/1957. Back in the 1950s, PAYG financing was seen as the most obvious and almost "natural" institutional choice for financing pension systems (Haverland 2001). In the countries of Western Europe, this period was characterized by high economic growth and advances in productivity. A key difference compared to the more classic "bismarckian" models is that since that period and particularly from the 1980s onwards, the Netherlands had developed a strong capital-based pension pillar, while the Austrian or the Germany systems, for example, continued to rely on the public PAYG component. As already mentioned in the section 2.2 on the history of policy reforms, in the late 1990s, the

percentage of PAYG-financed pensions as a share of overall pension income was 45% in the Netherlands, while in comparative welfare states, including Austria or Germany, it was still at 80% to 90% (Haverland 2001). Although the public PAYG component in Austria or Germany may have a more extensive functionality in the context of maintaining living standards, it is in particular the hybrid and diversified character of the Dutch system that makes the overall pension system robust against external developments. The overall system appears very resilient against ageing and unemployment, also because of its strong funded component. Regarding the character and nature of the Dutch pension system, scientific analyses highlight the importance of institutional path dependencies and historical developments, especially since the beginning of the 1980s, as a main reason for the development of the Dutch pension system (Haverland 2001). What is particularly relevant here is the different design and functionality of the PAYG component in the Netherlands, compared to the classic “Bismarckian” model in Austria or Germany. The Dutch AOW provides flat-rate benefits to all residents above the retirement age. Contributions are paid by employees and calculated as a percentage of personal income. However, the amount of pension benefits is neither oriented to income nor to contributions. Benefits are related to the national minimum income, providing for flat-rate pension benefits. Thus, the Dutch PAYG component does not include elements and functionalities to maintain living standards. Maintenance of living-standards is achieved primarily through funded occupational pensions. It is the funded occupational pension system that provides for the equivalence of contributions and benefits and thus ensures that living standards can be maintained. In the classic social insurance-based PAYG models, this function should largely be guaranteed by the public PAYG component.

The eligibility age for occupational pensions corresponds to the statutory basic pension age. The rules on pension deferral differ among occupational plans. It is possible to combine the occupational pension scheme and work. Some schemes allow a member to withdraw a pension and continue to work with the same employer (OECD, 2021d). The default pay-out variant for occupational pensions is that of a lifelong annuity (Dillingh & Zumbühl 2021). Until recently, it was not permitted to pay out even parts of the capital saved as a capital lump-sum. (Warren et al. 2021). Exceptions applied to very low pension entitlements up to a certain limit (Reichert 2018). In the debate about a new pension system in the Netherlands, much attention had been given to the freedom of choice, both in the accrual phase and in the benefit phase (Dillingh & Zumbühl 2021). New legislation added the extra option of taking out up to 10% of accrued retirement benefits as a partial lump-sum at the retirement date. With the new legislation, different pay-out options are now available. These options are (1) a flat-rate annuity, (2) a high/low annuity-based profile, and (3), as mentioned, a partial lump-sum at retirement with a lower annuity pension thereafter (Dillingh & Zumbühl 2021). According to recent research (Dillingh & Zumbühl 2021), the most popular pay-out option is still that of a lifelong flat-rate annuity. This provides for (nominally) constant monthly payments throughout retirement. Retirees receive a fixed monthly pension pay-out. While most pension contracts have the ambition to provide yearly indexation against inflation, the majority of pension funds was not able to do so in the years after the financial crisis. A constant nominal pay-out implies a slowly but steadily diminishing real payment. The third option is the pay-out in the form of high/low annuity-based payments. Here, retirees start with a period of high monthly pension pay-outs, followed by a period of lower pay-outs. The maximum

difference between the high and the low payment is regulated by law. Therefore, the low payment has to amount to at least 75% of the high payment (both before tax). The third option takes the form of a partial lump-sum payment in combination with a reduced annuity. In the lump sum profile, retirees receive a share of their pension savings – as mentioned, up to 10% of their total savings – as a one-time payment at the start of their retirement. Thereafter, they receive a constant monthly payment, based on their remaining pension savings. Therefore, the “capital option” of capital payments is very limited in the Netherlands. It was completely restricted above a marginal income level until recently. Even at this point in time, it is not possible to pay out more than 10% of total pension wealth as a capital option.

If not agreed otherwise, under Dutch law³⁴ partners are entitled to half of the old-age pension rights that a partner accrues during a marriage or civil partnership³⁵. The form of distribution of retirement pension entitlements is also known as “equalisation of pension rights” in the event of divorce. When a partnership ends, the former partner receives a share of the ex-partner’s pension as soon as this ex-partner stops working.

There is no automatic mechanism for inheritance of pension entitlements. Occupational pension plans in the Netherlands involve sharing mortality risk. The longevity risk is pooled and shared among the insured community. This ensures that pensions benefits are paid over a lifetime, but it also means there is no pension pot to pass on when a member dies. However, a partner’s pensions can be supplementary anchored in the pension contract. Such partner pension amendments are even common under both annuity and variable pension options (Warren et al. 2021, 3). By anchoring a partner’s pension in the pension contract, a participant accrues entitlements not only to his own pension, but also entitlements to a partner’s or to an orphan’s pension. A partner’s pension or a special “surviving dependent’s pension” is a pension entitlement that is built up for a spouse in the event of decease. As mentioned, occupational pension plans do not include a partner’s pension automatically. If there is an arrangement for a partner’s pension, however, this benefit will be paid out to the partner. In certain cases, the accrued pension capital is paid out to the beneficiaries as a lump-sum³⁶. The beneficiaries then are required to use this capital to purchase a surviving dependants’ annuity.

The third pension pillar consists of non-mandatory savings via individual plans such as life insurance companies. These plans are of minor importance, according to the information from the Ageing Report’s Country Fiche for the Netherlands.

2.9.3. Public pensions fiscal challenges

Public expenditure on public pensions

Public spending on public pensions in the Netherlands is anything but stable. The forecast of public expenditure on pensions, calculated within the scope of EU’s Ageing Report, indicates an increase in public pension spending from 6.8% of GDP in 2020 to 8.9% of GDP in 2060, with the

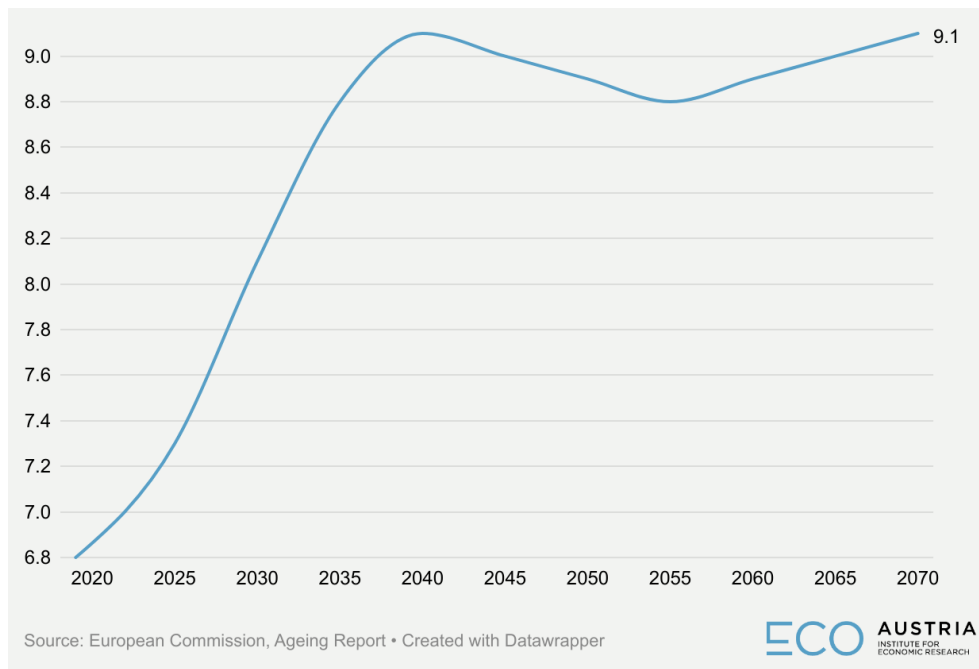
³⁴ Equalisation of Pension Rights in the Event of Divorce Act (“Wet verevening pensioenrechten bij scheiding, WVPS”).

³⁵ See information from the Dutch Government via [Weblink](#).

³⁶ See Information by ABN-AMRO via [Weblink](#).

greatest financing pressure arising in the years up to 2040. After 2040 public spending on pensions remains constant at around 8.9% to 9%. The key period for the increase in public pension spending is thus from 2020 to 2040, when public pension spending will rise by almost 2.3 percentage points.

Figure 43: Netherlands: Forecast of public expenditure on pensions (in % of GDP)



As regards the projection of public expenditure on pensions, the Netherlands is in a rather favourable situation, compared to other 11 countries considered. First, public pension spending is rather low at levels and, and second, a developed funded second-tier occupational pension system exists. From a systemic perspective, the latter is less vulnerable to changes in the age structure because later benefits depend on the assets accrued on occupational and personal accounts and benefits are based on individual contributions by the employer and the employee. Furthermore, the overall government debt³⁷ ratio relative to GDP for the Netherlands is 51% for 2022. This is much lower than the corresponding values for Austria (78.4%), Germany (66.3%) or Italy (144.4%). This underscores the fact that, from the perspective of the Netherlands, financing the cost increase will be significantly less strenuous and thus more affordable than it is the case for comparable countries.

The impact of a rising old-age dependency ratio on public pension expenditure can be shown by the old-age dependency effects. Within the scope of the EU Ageing Report the corresponding dependency ratio effect reflects the evolution of the ratio of the elderly (population 65+) to the working-age population (population 20-64) and its impact on public pension spending. The dependency ratio effect quantifies the impact of demographic changes on pension expenditure. Correspondingly the benefit ratio effect indicates how the average pension develops relative to

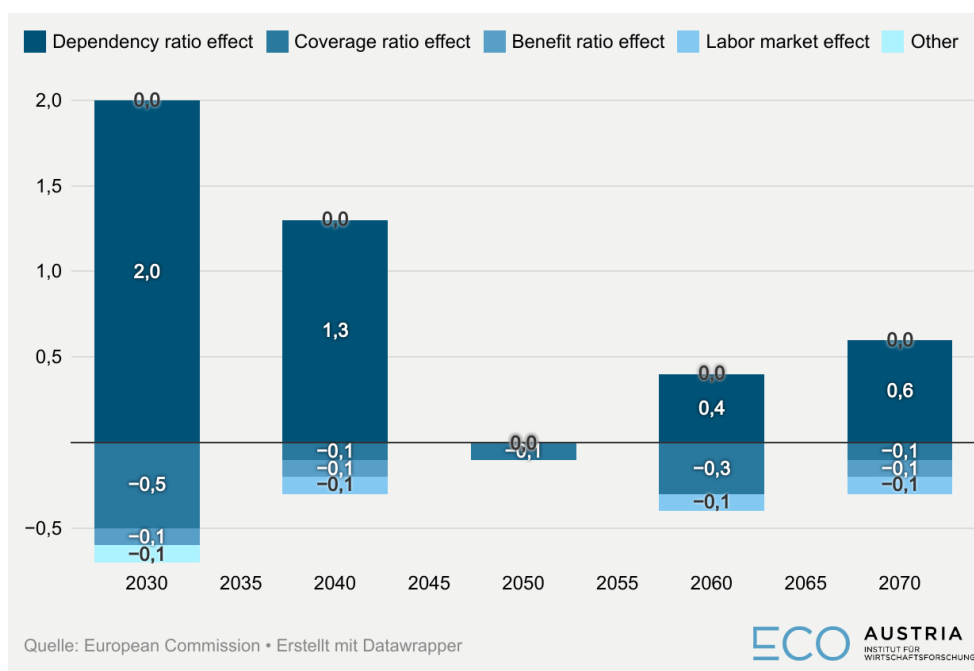
³⁷ Government consolidated gross debt according to Eurostat.

the average wage. For the Netherlands it is expected that total public pension expenditure will increase by 1.3 percentage points up to 2030 and by a further percentage point between 2030 and 2040, thus resulting in a cumulative increase of 2.3 percentage points up to 2040. This increase is relatively significant, also compared to the other countries observed in the comparisons in section (see country comparison in Section 2.14, especially Figure 74).

Rising old-age dependency ratios would have a much stronger effect on the increase in public pension expenditure when all other factors, such as benefit ratios, labour market participation and intensity, would be constant. However, the demographically induced increase in public spending on pensions will be partially offset by other factors. This is due to declining benefit rates and to changes in labour market and retirement behaviour, i.e., increased, or intensified labour force participation or postponed retirement from the labour market. The effect on the old-age dependency ratio is 2 percentage points by 2030 and another 1.3 percentage points from 2030 to 2040, resulting in a cumulative effect on the old-age dependency ratio of 3.3 percentage points by 2040. The comparative value up to 2070 is even higher at 4.3 percentage points. As mentioned, a decreasing benefit ratio will provide a partial offset for the rising public pension expenditure by cumulatively 0.2 percentage points of GDP in 2040 and by 0.3 percentage points up to 2070. Correspondingly the benefit ratio for public pensions is expected to decline from 37% to 36% in 2040 and further to 35% in 2070. However, compared to other pension systems, the yet adopted declines in benefit ratios are rather modest.

Delayed retirement also has a cost-reducing effect. This channel is mainly expressed in declining coverage ratio effects. The coverage ratio effect is expected to lower pension expenditure by cumulatively 0.6 percentage points up to 2040 and 1.2 percentage points up to 2070.

Figure 44: Netherlands: Components of change in the public expenditure



Forecast of benefit ratios and replacement rates

Table 22 shows the development of the benefit ratios and replacement rates. It also shows the interaction between statutory first-tier pensions and quasi-mandatory occupational pension schemes. It becomes obvious from the projections of benefit ratios that – given the increase in old-age dependency – benefit rates are relatively stable over the projection period, compared to other countries. For Italy, for instance, the benefit ratio for public pensions is projected to decline from currently 61% to 49% in 2050. In Austria the benefit ratio for public pensions will fall from currently 54% to 46% in 2050. For the Netherlands the benefit ratio for first tier public pensions remains almost constant at 34% and 33%, respectively. The benefit ratio for statutory first tier pensions might be low. However, the difference to the total benefit ratio is filled up by occupational funded schemes. The total benefit ratio will decline from currently about 65% to 64% in 2040 and further to 61% in 2070.

The replacement rate at retirement (RR) is defined as the average first pension of those who retire in a given year over the average wage they earned before retirement, whereas the benefit ratio (BR) measures the average pension benefit of all pensioners against the average, economy-wide wage. The replacement rates are lower than the benefit ratios because in the Netherlands wages rise strongly with age. Wages just before retirement are therefore relatively high, leading to a larger decline in income at retirement.

Table 22: Netherlands: Benefit ratio and replacement rates until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Public scheme (BR)	37%	36%	36%	36%	36%	35%	-2.0
Public scheme: old-age earnings related (BR)	34%	33%	34%	34%	34%	34%	0.0
Private occupational scheme (BR)	49%	43%	46%	45%	44%	43%	-7.0
Private individual schemes (BR)							
Total benefit ratio	65%	62%	64%	63%	62%	61%	-5.0
Total replacement rate	54%	51%	53%	52%	51%	50%	-4.0

Source: European Commission • Created with Datawrapper

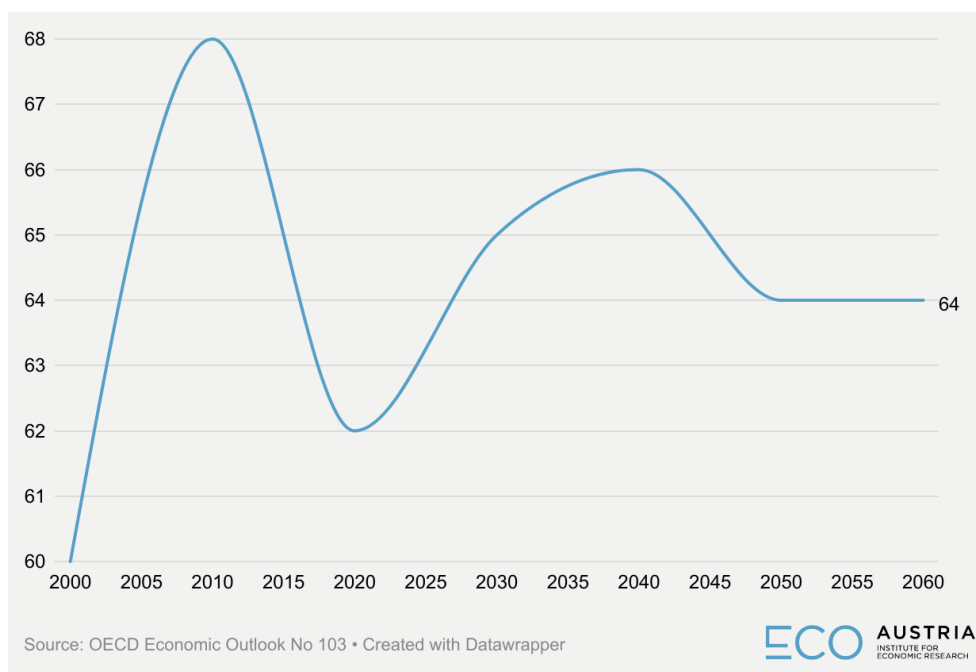
Forecast of the debt levels

As shown in Figure 43, the overall increase in public pension spending in the Netherlands is at a lower level than in comparable countries, such as Austria, Germany or Italy. Nevertheless, also in the Netherlands there is a distinct increase in public pension spending, especially in the years 2020 to 2040. Currently, public pension expenditure (gross) amounts to about 7% of GDP. In 2040, they will amount to more than 9% of GDP. First, it should be borne in mind that that partly due to the financing system, the burden on public budgets is much less pronounced in the Netherlands than in other countries. The Dutch overall system is based to a lesser extent on public financing, or in other words, PAYG is a financing a smaller component of the Dutch pension system, namely the first statutory pension tier. Thus, the overall system is exposed to fiscal pressure stemming from society's ageing, but this happens on a smaller level. For example, public

spending on pensions in 2040 will amount to about 15% in Austria and almost 18% in Italy. As showed above the yet adopted and institutionalized cuts of benefit ratios are relatively moderate. The financing pressure, which can also be observed in the Netherlands, can be seen as affordable against the background of a government consolidated gross debt. In 2022 the Dutch gross debt level was around 51% of GDP in 2022. Comparable countries such as Germany (66.3%), Austria (78.4%) or Italy (144%) face more difficult starting conditions for financing, while at the same time having a similar or even higher demographic burden.

In the longer term the costs of aging, not only for pensions but also for health and long-term care, are also evident for the Netherlands. General government gross financial liabilities will rise from currently around 62% to around 66% by 2040. *Ceteris paribus*, this will also be reflected in a corresponding increase in the government debt ratio. From 2050, general government gross financial liabilities will be constant at 64%. This is 2 percentage points higher than the current starting values.

Figure 45: Netherlands: Projection of long-term gross financial liabilities (in % of GDP)



2.9.4. Funded Pensions (Second and third tier)

The second pillar of the Dutch pension system comprises the occupational pension schemes. Second pillar contributions are normally laid down in collective pension agreements and are typically shared between employers and employees. Employers usually pay a higher share, roughly two-thirds (OECD 2021a). These completely funded occupational pensions plans have an important function in the Dutch pension system to ensure an overall replacement rate of 75% for a life-time career over 40 years. Most schemes have a target total replacement rate of 70% of final pay. Private benefits are reduced by a franchise amount provided by the first-tier basic state pension. This underlines that the various elements of the Dutch pension system are systemically

integrated. Occupational pension plans supplement the state pension and, in contrast to public PAYG AOW pensions, are tied to past contributions and previously earned income. With about 90%, most persons employed in the Netherlands participate in an occupational pension scheme. Although funded DC plans are currently on the rise most of the occupational plans are still designed as funded DC plans. As mentioned, the overall pension replacement target is 75% of the average salary. Most pension funds currently have an average pay scheme promising a maximum yearly accrual rate of 1.875% of average career salary (including first-pillar benefits). If the collective labour agreement lasts for 40 years, total pension benefit (first plus second pillar) therefore will be 75% of the average salary. Pension rights are correspondingly built up from the contribution basis, which is the wage minus the AOW franchise. Occupational pension premiums are only paid over the contribution basis income.

Indexation of pension rights of the working population used to equal on average 50% of the wage rise and 50% of the price rise, though in recent years price indexation seems to have become more dominant especially for the retired. Indexing is conditionally and dependent on the financial situation and the rate of coverage (funding ratio) of the pension funds and sponsors. Most pension plans have implemented limited indexation or stopped it entirely after the financial crisis. In the context of the continued high importance of DB plans, it must be taken into account that the associated benefit promises actually only refer to nominal benefit levels. In other words, even with DB plans the level of benefits decreases in real terms.

In the Netherlands, according to the Ageing Report's Country Fiche, there are mainly four types of occupational pension providers: (1) industry-wide pension fund providers that administer the pension scheme of a whole branch of industry; (2) company-specific pension fund providers that administer the pension scheme of a larger enterprise; (3) pension funds for professional groups which have to do with self-employed professionals within a particular profession (there are only active members and pensioners and no employer); (4) insurance providers who have to deal with group life insurance contracts for separate enterprises.

The joint capital of these pension providers is estimated to be more than twice the size of GDP. According to OECD's Pension Markets for in Focus (2023) total assets in private and funded schemes amounted 213% of GDP in 2021, recently increasing from 194% in 2019. Here also savings from voluntary individual pension plans are included. However, third tier individual pension plans are of minor importance for the Netherlands (EU, 2020b).

The pension sector is also concentrated. The largest fund, with an invested capital of EUR 466 billion (The Dutch Civil Servants' Pension Fund ABP), represents around 25% of the total assets. The largest five funds share about a half of the total assets. At present (end of 2019), 216 pension funds are in operation. Other than these, 40,000 group pension agreements have been made with insurance providers by companies that do not have a pension fund. All these pension providers are being supervised by the Dutch Central Bank (DNB). About 95% of the capital is managed by pension funds (including Pension Premium Institutions, PPI).

According to OECD's Pension Markets in Focus (2023, p. 14) in the Netherlands the legislation does not require employers to set up a plan for their employees. However, participation in a plan

in these countries is quasi-mandatory as the decision is made at the industry or branch level through collective bargaining agreements. Occupational pension plans for employees in the Netherlands are widespread, but do not cover all salaried employees. About 10% of employees do not have an occupational pension plan.

Investment regulations

Occupational and private pension funds are under the supervision by Dutch Central Bank (DNB). According to information from the DNB³⁸, the Pensions Act – for company pension funds and industry-wide pension funds –, the Mandatory Occupational Pension Scheme Act – for occupational pension funds – and the secondary legislation based on these laws impose prudential and material requirements on the pension funds and providers. Prudential requirements concern for example the propriety of policymakers, the expertise of policymakers, the operational management, material requirements concern for instance the administration agreement between the employer and the pension fund or pension scheme rules between the pension fund and its members. These requirements have been elaborated in greater detail in secondary legislation and concern all kinds of operational, technical and financial aspects as well as related risks.

However, regarding specific investment vehicles or asset classes providers of funded occupational and personal pensions face a large degree of freedom: There are no specific legal restrictions on the equity exposures of Dutch pension funds. However, there are restrictions on investments in single issuers and issues. The pension funds may not acquire more than 10% in a single issue or from a single issuer. This applies to all asset classes, including equity exposures. The restrictions are with a maximum holding of 5% even more stringent for investments in issues of the employer financing an occupational plan.

According to OECD's annual survey of investment regulation of pension funds (OECD 2021a) the Netherlands is among a few countries that do not impose any specific ceiling on any asset class but expect pension providers to invest according to the prudent person principle. No specific or explicit limits are set exemplary for real estate, bills and bonds issued by public administrations, equity or bank deposits.

According to information from the Ageing Report's country fiche for the Netherlands the supervision structure, the financial assessment framework (FTK), has been revised in 2015. The government, social partners, pension fund administrators and the supervising authority agreed that some stopgap regulations, aimed at short-term financial stability, could be counterproductive to the long-term quality of the pension system. Pension funds are now allowed to base their indexation policies on the year-averaged funding ratio instead of the funding ratio at the end of the year. Since most occupational plans are still DB schemes, although the transition to more DC elements is evident, the funding ratio of funded and private DB plans is a useful indicator for assessing the sustainability of funded pensions. Funding ratios measure the proportion of liabilities that available assets cover. When the value of assets in DB plans is less than the value of liabilities arising from the retirement income promise, or in other words, when the funding ratio

³⁸ For information see DNB's website under the [Weblink](#).

is below 100%, the plan is underfunded. According to OECD's Pension Markets in Focus (2023) the funding ratio of such DB plans was 114.8 in 2021, indicating the sustainability of funded DB plans in the Netherlands.

Moreover, current rules already allow that the cost-effective contribution rate to be based on the ten-year-averaged interest term structure. These measures intend to make the participants in the pension system less vulnerable to short-term fluctuations in the interest rate and the capitalization rate of the funds. It is legally required for pension funds to determine a cost-effective contribution rate and a minimum solvency rate to guarantee their members a pension benefit. If the amount is less than this basic limit, pension funds are compelled to take measures (including cutting promised pension benefits) to restore this level. According to the FTK, pension funds must state in a clear way whether or not they will index the pension rights and under what conditions they intend to do so. The parameters used in FTK will be assessed every five years (such as the expected returns on assets and expected inflation).

Assets allocated

According to OECD's Pension Market in Focus (2023) the Netherlands is not only a country with one of the highest shares of assets in private and funded pensions plans, but also one of the countries with the highest share of assets invested abroad. Almost 90% of assets accumulated in private and funded pension plans are invested abroad. In general, countries with the highest proportion of pension assets invested abroad are European countries with small capital markets. Among the ten countries with the largest proportion of assets invested abroad, nine were from the euro area or were using the euro as their main currency in 2021: Malta (98% of assets invested abroad), Latvia (90%), the Netherlands (89%), Lithuania (88%), the Slovak Republic (85%), Portugal (84%), Estonia (81%), Slovenia (72%) and Italy (69%).

Also, the share of assets invested in foreign currencies was rather high compared to other countries. According to OECD's Pension Markets in Focus the share of assets invested in foreign currencies was about 55%. The share of assets invested in foreign currencies has increased in the last years, from about 51% in the year 2015.

At about 43%, the main investment instrument for private and funded pensions in the Netherlands are bills and bonds. Only about 31% of assets are invested in equities, corresponding to only the 18th highest equity share compared to 38 OECD countries. The equity share is much higher for many comparable countries like Belgium (50%), Finland (46%) or Canada (41%).

Excursus on the investment structure of Dutch DB schemes

To date, the structure of funded company pension plans is determined by defined benefit (DB) plans. According to the EU Commission study on drivers of investments in equity by insurers and pension funds (2019) two main types of occupational pension providers (i.e. "Pensioenfondsen" and "Premiepensioeninstelling") exist in the Netherlands. These provide various types of pension plans, i.e. DB, DC and hybrid pension plans. A "Pensioenfonds" can offer both DB and DC plans, while the latter offer hybrid plans. In principle, DB and DC plans differ with regard to the risks (e.g. investments, longevity, inflation) that are shared between policyholders and pension providers. With DC pension plans, specific benefit levels are not defined or guaranteed, and the risks are

largely borne by the participating policyholders (OECD 2021, 216). By contrast, DB pension fund plans “promise” future payouts to policyholders (Rousová et al. 2021). Compared to DB plans, risks are to a larger extent transferred to the sponsoring employers or to pension fund providers.

Historically and still proportionally, occupational pension schemes in the Netherlands are largely organised as DB plans. Accounting for 99.6% of the total assets in 2017 (EU 2019, p. 2), DB plans were still most common at the end of the last decade. This is also due to historical reasons (Kemna et al. 2011, 29)³⁹. According to the Global Pension Assets Study 2023 (TAI 2023, p. 17), in 2021 DB plans still accounted for 95% of pension assets in the Netherlands (also Higgins 2021).

Rising life expectancy and falling interest rates are putting pressure on the financing of benefit commitments (Hintze 2021). As regards the financing of pension entitlements falling and low interest rates are a challenge for providers of DB-funded pensions: Within the scope of DB plans, the present values of “promised” future benefit pay-outs are calculated based on discount rates. Lower discount rates lead to higher present values of both the benefit promises and the assets. Although the present value of both the liabilities and the assets increase when interest rates fall, the overall effect is often more intense on the liabilities side than on the assets side, which is due to a “negative duration gap”. Specifically, the overall effect will depend on the actual duration of the assets and liabilities. However, as occupational DB pension funds are confronted with long-term, interest-sensitive liabilities, a longer duration of the liabilities compared to the duration of the assets can be expected. Falling interest rates and increasing life expectancy as well pose structural pressures on providers of DB plans (Rousová et al. 2021, Antolin et al. 2011 for OECD). This draws attention to the investment structure and strategies of DB plans and to the forms of risk management and hedging.

Based on recent policy reforms with a new Pension Act (“Wet toekomst pensioenen” – WTP), occupational pensions are currently transitioning from a DB to a more DC dominated system. Existing DB rights will be transformed into DC capital sums (Cremers and English 2023, p. 33). The Dutch pension funds will switch to a DC system by 2027 (Rousová et al. 2021). The aim of the policy reform is to mitigate pressures on the financing of DB plans. As DB plans are still the most common form of occupational pension in the Netherlands, one could assume that this structure has had an influence on investment strategies of Dutch pension providers in the past. Rousová et al. (2021) point out, that DB schemes face a lower bound on their expected returns through statutory minimum funding ratios, and face interest rate risk exposure through their liabilities. This offers them a strong incentive to reduce negative duration gaps. Theoretically, various strategies come into consideration in order to deal with a negative duration gap. If pension providers and funds want to reduce negative duration gaps, they intend to increase the duration of their assets. This can be done through purchases of long-duration bonds. An alternative

³⁹ Originating in the 1950s, pension funds in the Netherlands were set up initially as traditional DB plans, similar to those in the United States and United Kingdom (Kemna 2011, 29). The “classical” DB plan was oriented to the final pay. After 40 years of service and at an accrual rate of 1,75% of pensionable wage per year participants were entitled to pension payments of 70% of the final salary. Pensioner faced no benefit risk (Westerhout et al. for CPB 2021, 9). In the light of stagnating and temporary collapsing equity markets after 2000 two major changes had been introduced by pension funds. The first was the introduction of conditional indexing benefit payments according to the solvency position of funds (depending on the funding or coverage ratio) based on an instrument called “policy-ladder”. The second was the transformation of final-pay into average-pay DB plans.

strategy in the context of decreasing profitability would be to accept a higher interest rate risk. Funds may increase their investments in riskier asset classes such as equities, real estate and alternative assets, in order to boost income from investment. A third way of dealing with a negative duration gap is implemented on the liabilities side. Providers of occupational pensions might switch to products with lower or no guaranteed returns. In line with the objectives of recent pension reforms in the Netherlands, this is exactly the case, when pension plans change from DB to DC. Empirically, Rousová et al. (2021) report evidence from European pension markets, that DB products are overweight long-term debt securities, whereas DC products are more heavily invested in equity and investment funds shares. Fixed income portfolios linked to DB products tend to have longer maturities (Rousová et al. 2021). Portfolios tied to DB pensions might underweight equities, while the opposite is true for portfolios related to DC products.

Results from the OECD's Pension Markets in Focus publication indicate that pension providers in the Netherlands still were more successful in market terms, compared to other countries in the country sample. Over the timespan of 10 years from 2012 to 2021 the real investment rate of return was almost 6% for the Netherlands, compared to 2.9% for Austria, 2.3% for Germany, 2.5% for Italy or 2.1% for Poland. Over the last 17 years, from 2005 onwards, the corresponding value was 5% for the Netherlands, compared to 1,8% for Austria, 2.3% for Germany, 1.8% for Italy or 2.3% for Poland (OECD 2022). Over the years from 2012 to 2021 the share of assets invested in equities was 33% for the Netherlands. This might indicate a higher risk exposed asset structure in the Netherlands, compared to Germany (5.5%), Denmark (23,3%), Italy (20,2%) or Sweden (14%). The proportion of assets invested in equities shows a downward trend over the years from 2012 onwards, with the highest proportion (varying from 37% to 39%) being achieved in the years 2013 to 2015. However, no clear pattern can be recognised with regard to the proportion of bills and bonds. The share of investment in bills and bonds was at a medium level of 44.6% in the years from 2012 to 2021, which corresponds to the 22nd highest level among 37 OECD countries observed. The proportion of bills and bonds was higher than in Austria (42.4%), Denmark (32%) or Sweden (17.4%), but still lower compared to Germany (50%) or Italy (46%).

For the Netherlands, a maybe more relevant distinction can be made in the context of assets invested abroad. With 85% of pension assets invested abroad, Netherlands has the highest share among all OECD countries observed in the 2022 Pension Markets in Focus publication. The comparative value is 33% for Denmark, 62% for Italy, 6% for Poland, 18% for the UK or 17% for Sweden. The internationalisation of the pension assets took place during the 1990s, when Dutch pension funds diversified out of private loans, mostly to the Dutch Government, into equities, real estate and bonds (Franzen 2010, 39).

According to the analysis of risk-taking Kemna et al. (2011, 29) conclude that the Netherlands holds an in-between position between higher risk profiles in most Anglo-Saxon countries, on the one hand, and a more-conservative risk profile in most of continental Europe on the other hand. Authors expect that a shift towards DC products could boost equity financing and support further growth of the investment fund sector (Rousová et al. 2021). With the new pension plan in the Netherlands and the expected transition from DB to DC plans financial experts expect that funds will show less demand for long-term fixed-income assets compared to the past (Hintze 2021).

Investment performance

In 2021, the real investment rate of return from funded and private pension plans was 2.1%, according to OECD's Pension Markets in Focus. Of 34 OECD countries observed, the Netherlands ranked only 16th according to the average real rate of return. However, for reasons of performance comparisons a longer timespan must be taken into account. Over the last 10 years the average of real average annual rates of return for funded and private pension plans was 5.8% and thus significantly above the comparative value for the last year. Among 37 OECD countries compared, this corresponds to the 6th highest value. In the medium term, the performance of private and funded pension plans in the Netherlands is therefore above average compared to other countries.

Tax treatment

For the classification of the tax regime for funded pension plans, we refer to the classification of the World Bank and the OECD (Whitehouse 1999). According to that, three transactions constitute the process of saving via funded pension schemes, each providing an option for taxation: 1) when money is contributed to the fund, normally by employers and employees or by an individual insurant, 2) when investment income and capital gains accrue to the fund and 3) when retirees receive benefits. In the classification system, taxation or exemption is indicated by either a "T" for taxation or an "E" for exemption.

Funded occupational pension schemes play a leading role in the Dutch pension system. According to OECD (2021d), this form of saving is attractive as it is tax favoured. The tax regime of funded occupational pension plans is mostly described as an EET system (Table 23), i.e. contributions and funds' returns on the investments including equity and dividends are tax exempted, while withdrawals and benefits in payment are subject to taxation or partial exemption respectively (EU 2019 for the Netherlands).

Table 23: Netherlands: Taxation regime for funded pensions

Taxation regime for funded pensions in te Netherlands				
	Source of contribution	Contributions	Returns	Withdrawals
All	All	E	E	T

Quelle: OECD (2022). Annual survey on financial incentives for retirement savings. • Erstellt mit Datawrapper

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Contributions to an occupational plan are not considered as taxable income to the employee (OECD 2022b, p. 78). The tax exemption on the contribution side – indicated by the first “E” in “EET” – applies only up to a maximum income. The maximum income for the EET regime is set at EUR 112,189 in 2021 (OECD 2021a). For the income that exceeds that threshold a TEE system is applied. Persons with income above this level may contribute a percentage of income to an occupational pension plan, but the income considered to calculate the contribution is capped at the threshold of EUR 112,189. If the person wants to make extra contributions, she or he must open a voluntary pension plan. Extra contributions in such voluntary plan are not tax-deductible. In contrast to the standard EET regime for occupational pensions, here investment income and

capital gains are tax exempt, as well as the benefits paid out from this voluntary pension plan, resulting in a TEE system. Contributions made under the TEE system are taxed at the individual's marginal income tax rate.

Similar to occupational pension plans, the contributions to voluntary private pension contracts are also tax-exempt. Contributions to private personal old-age provisions are tax-deductible up to a limit. Contributions are limited to 13.3% of the annual income, with a ceiling of EUR 114,866 in 2022 (OECD 2022b, 78), minus a threshold for first pillar general AOW state pension. To prevent accumulation of the tax relief accrued pension entitlements in occupational pension plans are taken into account. Up to a limit the contributions for both, occupational and individual pension plans, are tax exempt. Compared for example to Austria, where contributions to personal pension plans are taxed at the individual's marginal rate of income tax (OECD 2022b, 20), this provides a strong incentive individual pension saving. A favourable taxation in the first contribution stage is expected to provide a more relevant incentive, to start participating in a voluntary individual pension scheme. Also, from an economic point of view, a tax exemption in the contribution phase could provide a stronger incentive, as the marginal tax rate on earned income will generally be higher than that on pension benefits.

The accrual of investment income and capital gains is tax exempt. Returns on investments are not taxed, indicated by the second "E" in the "EET" formula. There is no ceiling on the lifetime value of private pension funds. No tax applies on funds accumulated (OECD 2021a).

In the Dutch system, taxation basically starts at the time of payment. Income from occupational and personal pension plans under the EET system is taxed at the individual's marginal income tax rate (OECD 2021a), indicated by the "T" in the third position in the "EET" form. A general personal tax credit is available to all taxpayers. The amount of the general tax credit depends on the age of the individual and the level of the individual's income. For persons at or above the statutory retirement age, a tax credit of EUR 1,469 applies, if the person's income is less than EUR 21,043. For persons who have not yet reached the eligibility age for a state pension, the comparative tax credit is EUR 2,837 (OECD 2021a). In addition, individuals at or above state pension eligibility age are entitled to a special tax credit called the "elderly allowance". This tax credit is EUR 1,703, reduced by 15% of the aggregate income to the extent that this income exceeds EUR 37,970. For singles, this tax credit is increased with a fixed amount of EUR 443.

Lump sum payments are generally not permitted, unless the annuity payment is very small. Lump sum payments are taxed as income. However, this applies only to individual pension plans. The occupational pension capital cannot be paid out as a lump sum to the employee.

Similar conditions apply to social security contributions. On pension contributions no social contributions are levied. Conversely, pensioners pay 9.75% of their taxable income for the general insurance of certain health costs and survivors' pensions up to an income of EUR 35,129 in 2021 (OECD 2021a). Thus, pensioners pay for their own health insurance depending on their income. Contributions are the same as the contributions for those below the age from which the general state pension payments are received. However, they no longer need to pay the contribution for the AOW first pillar state pension.

2.9.5. Highlights and main features of the system

1. Strengths and weaknesses (according to Overall Pension Index – OPI)
<ul style="list-style-type: none"> - The Dutch pension system ranks top with regard to “Adequacy” (with an OPI score of 0.76 and ranked 3rd among 11 countries) and “Market capitalization” (OPI score 0.71, ranked 4th). - The system is characterized by a variety of PAYG- and funded components. Only basic elements are PAYG, the overall pension system therefore appears affordable, resilient and adequate. - Particularly since the 2008/2009 crisis, low interest rates and decreasing coverage ratios increased the pressure on funded DB plans, which are still the most common form of occupational pensions.
2. Tax treatment
<ul style="list-style-type: none"> - 1st tier: Contributions are not deducted from the income tax base. Benefits are taxed as personal income (Holzmann & Genser 2020). 2nd and 3rd tier: EET (up to certain limits, above these limits TEE).
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - Contributions to occupational plans are fund-specific. OECD (Pensions at a Glance, 2023c) reports “typical” rates for 2022 of 7.4% of the salary, paid by the employee (roughly 1/3 of contributions), and 11.2%, paid by the employer (roughly 2/3). The total contribution is 18.6% on earnings above the AOW franchise. The franchise amount is the part of the salary for which no pension contribution is awarded. As of 1 January 2023, the franchise is EUR 16,878 per annum for full-time work.
4. Asset Allocation
<ul style="list-style-type: none"> - In the year 2022 according to OECD: Equities (30.9%), Bills & Bonds (42.9%), Cash & Deposits (2.0%), Other* (24.2%) <p><small>* Assets invested in loans, real estate (land and buildings), unallocated insurance contracts, private investment funds and other alternative investments.</small></p>
5. Obligatory character
<ul style="list-style-type: none"> - All residents are insured in the statutory 1st tier AOW public pension scheme. Contributions are compulsory for all employees under the retirement age. - Approximately 90% of employees are covered by occupational pensions. These are anchored in collective agreements and therefore binding (quasi-mandatory) for employers in a certain industry.
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - For occupational pensions 3 pay-out options are available: (1) a flat-rate annuity, (2) a high/low annuity-based profile, and (3) a partial lump-sum (up to 10% of the total capital) at retirement with a lower annuity pension thereafter. The most popular pay-out option is a lifelong flat-rate annuity (1).
7. Contributions to funded plans as percentage of GDP
<ul style="list-style-type: none"> - According to the EIOPA IORP statistics, net contributions in 2022 amounted EUR 48.2 billion. Given a GDP of EUR 958.5 billion (2022) this corresponds to a contribution volume of 5% of GDP.
8. Investment performance
<ul style="list-style-type: none"> - 10-year average investment rate of return 2011-2021 according to OECD: 5,7% - At the same time the OECD average was 3.7%.



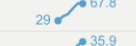
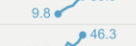
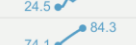
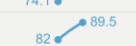

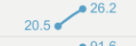
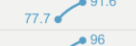





Additional information and results

- The pension system integrates elements of all three tiers. (Quasi-)mandatory elements comprise the 1st tier statutory pensions and 2nd tier occupational pensions. The latter are funded and quasi-mandatory, anchored in industrial collective agreements. The former is a mandatory, contribution based social security system, financed by social contributions and PAYG mechanisms.
- Statutory state pensions are only a part of the total old-age pension system, providing minimum income for all pensioners. Living standards are mainly guaranteed in the form of funded occupational pensions.
- Because only basic elements in form of public state pensions are financed on a PAYG basis, the fiscal pressure on public pension spending seems “affordable”. However, raising fiscal pressures on public pension expenditure is still evident from the recent projections.
- Funded pension plans play a very important role in the Netherlands, also because funded occupational pensions are quasi-mandatory and institutionalised in most collective industrial agreements. However, still about 10% of employees are not covered, neither are the self-employed. Overall, however, voluntary private third-tier pensions play a minor role.
- The Netherlands are one of the largest markets for funded pension markets in Europe. Total assets amounted to more than 200% of GDP 2021. The share of assets in funded and private pension plans invested abroad is almost 90%. This corresponds to one of the highest foreign investment rates among the 11 countries observed. And more than 50% of investments of funded and private plans are invested in assets issued in foreign currencies. The Dutch occupational pension providers (IORPs) are therefore particularly global and international.

2.10. Poland

2.10.1. Demographic profile and demographic forecast

Table 24: Poland: demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	37,957	36,957	35,587	34,022	32,441	30,807	
Population growth rate	0.0	-0.3	-0.4	-0.5	-0.5	-0.5	
Old-age dependency ratio (pop 65+ / pop 20-64)	29.0	38.9	43.9	57.0	68.2	67.8	
Old-age dependency ratio (pop 75+ / pop 20-74)	9.8	15.7	20.1	22.5	30.8	35.9	
Ageing of the aged (pop 80+ / pop 65+)	24.5	25.6	36.3	32.2	36.8	46.3	
Men - Life expectancy at birth	74.1	76.5	78.7	80.7	82.6	84.3	
Women - Life expectancy at birth	82.0	83.8	85.4	86.9	88.3	89.5	
Men - Life expectancy at 65	16.1	17.6	18.9	20.2	21.4	22.6	
Women - Life expectancy at 65	20.5	21.8	23.0	24.2	25.2	26.2	
Men - Survivor rate at 65+	77.7	81.9	85.1	87.7	89.8	91.6	
Women - Survivor rate at 65+	90.1	91.9	93.2	94.3	95.2	96.0	
Men - Survivor rate at 80+	44.1	51.9	58.5	64.4	69.8	74.4	
Women - Survivor rate at 80+	68.4	73.6	77.7	81.3	84.3	86.9	
Net migration (thousand)	3.3	25.4	37.5	47.6	60.4	72.4	

Source: European Commission • Created with Datawrapper

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According to the demographic forecast for Poland (Table 24), the population will continue to decline from about 38 million today to only about 30.8 million in 2070, mainly because of very low fertility rates. The composition of the population will change dramatically towards a much higher proportion of older people. The current old-age dependency ratio (of the population aged 65 and over as a proportion of the population aged 20 to 64) of 29% will almost double by 2050 (57%) and rise to 67.8% in 2070, corresponding to about 1.5 persons of working age for each person aged 65 and over. The "ageing of the aged" indicator, i.e., the ratio of persons aged over 80 to persons aged 65+, will increase from 24.5% today to 36% in the longer term, reflecting rising life expectancy. All indicators of life expectancy, both at birth and at age 65, are expected to increase sharply for both men and women, reaching an average of almost 90 years for women and more than 84 years for men in 2070. Furthermore, more than 90% of both men and women are expected to survive to the age of 65, and almost 75% of men and almost 87% of women are expected to survive to the age of 80 in 2070. Net migration is expected to increase slightly from current levels, but it does not change much in the demographic projection (Figure 46 and Figure 47).

Table 25: Poland: exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labor market exit age (CSM) – Men	64.5	64.5	64.5	64.5	64.5	64.5	64.5 — 64.5
Duration of retirement – Men	16.8	18.2	19.6	21.0	22.2	23.4	16.8 — 23.4
Percentage of adult life spent in retirement – Men	26.5	28.1	29.7	31.1	32.3	33.5	26.5 — 33.5
Early/late exit – Men	1.5	1.0	1.1	0.8	0.7	0.9	1.5 — 0.9
Average labour market exit age (CSM) - Women	61.3	61.3	61.3	61.3	61.3	61.3	61.3 — 61.3
Duration of retirement - Women	23.8	25.2	26.5	27.7	28.8	29.9	23.8 — 29.9
Percentage of adult life spent in retirement – Women	35.5	36.8	38.0	39.0	39.9	40.8	35.5 — 40.8
Early/late exit - Women	0.3	0.3	0.3	0.3	0.2	0.2	0.3 — 0.2

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

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Despite increasing life expectancy, the average exit age from the labor market for both men and women is not expected to increase until 2070 (Table 25) and will remain at the current level of 64.5 years for men and 61.3 years for women. Due to higher life expectancy, the duration of retirement will increase from 17 to 23 years for men and from 24 to almost 30 years for women. On average, men are expected to spend more than one-third of their lives in retirement in 2070, while this figure is higher for women, reaching more than 40% in 2070. Opportunities for early retirement are generally quite limited, which is reflected in relatively low early/late ratios of currently 1.5 (and falling to 0.9) for men and between 0.2 and 0.3 for women.

The role of migration

Figure 46: Poland: demographic forecast with and without migration (2022-2060)

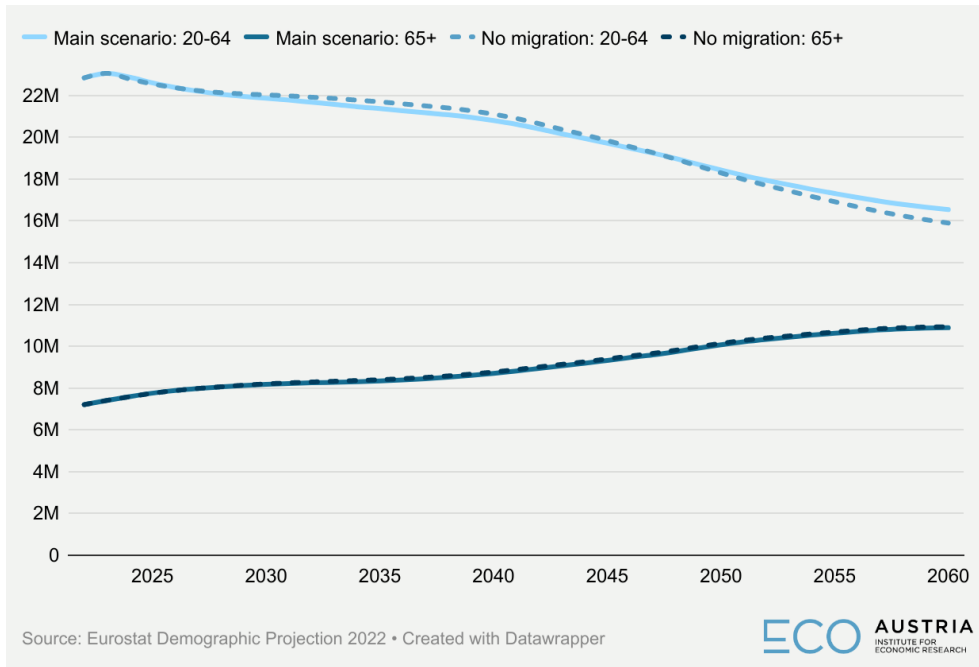
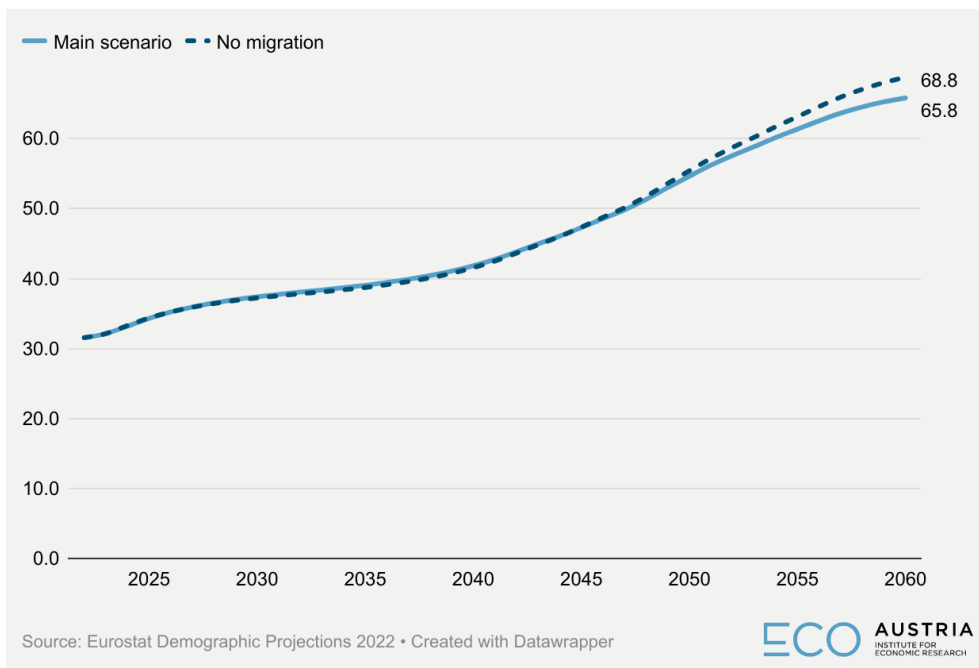


Figure 47: Poland: old-age dependency ratio (65+/20-64) in the main scenario and without migration



Migration has a relatively small impact on the sustainability of the pension system in Poland. In 2060, the population aged 20-64 is 640,000 persons higher in the main scenario than in the "no migration" scenario, which corresponds to 3.88% of the working-age population. As a result, the two projections are very similar. Similarly, the old-age dependency ratios in 2060 are only slightly

different, at 65.8 in the main scenario and 68.8 in the "no migration" scenario. As a counterfactual (and assuming the migrant population has the same fertility rate and age structure as the native population, and that most of the migrant population will not have reached retirement age by 2060), we can calculate the annual migration that would be required to maintain the old-age dependency ratio of 2022 in 2060. To maintain the old-age dependency ratio of about 32 in 2060, the necessary immigrant (or returning) population in 2060 would have to be about 18.7 million inhabitants. This would imply a net migration of about 493,000 persons per year.

2.10.2. General architecture

The Polish pension system consists of three main social insurance schemes:

- General Pension System, which covers the majority of employees and self-employed,
- Pension system for farmers,
- The pension systems for security forces (police and other security services, professional soldiers, judges, and prosecutors) operate separately, without contributions, and are financed from the state budget.

The following description corresponds to the general system, which covers about 86.2% of pension budgets (or about 84.2% of pensioners).

Qualifying conditions

The retirement age is 65 for men and 60 for women. Early retirement is very limited. As the system has been reformed several times, several rules apply simultaneously. For persons born after 31.12.1948, there is no minimum contribution period to receive a full pension. For older persons, the qualifying periods were 25 years for men and 20 years for women. For persons born after 31.12.1948, these rules apply to qualify for a minimum pension. As pension benefits are calculated based on accumulated capital and life tables, there are no other rules regarding retirement without a full pension.

Current and future retirement age

The retirement age is 65 for men and 60 for women. The retirement age was to be gradually increased to 67 for both sexes. Parliament decided in November 2016 to reverse the previous increase in the retirement age, so that the long-term retirement age will be 65 years for men and 60 years for women.

First-tier pensions

Minimum pension is guaranteed for men and women with at least 25 and 20 contributory years respectively. If the total pension (the sum of NDC and FDC pensions, see below) is below the minimum level, the pension is supplemented by the minimum pension guarantee, which is financed through the state budget. The minimum pension is specified as an amount of money and indexed in the same way as other pension benefits. The level was 23.6% of average gross earnings in 2020.

Second-tier PAYG pensions

The overall shape of the pension system is the result of the 1999 reform, which fundamentally changed the structure of the system. The defined benefit (DB) system was transformed into a defined contribution (DC) system. Currently, the mandatory part of the system is divided into two parts: non-financial (NDC) and financial (FDC). The former is administered by a public institution - the Social Insurance Institution (ZUS) - and the latter by private institutions (European Commission, 2021). In general, the pension contribution is 19.52% of the so-called "contribution base", which in the case of employees, with few exceptions, is equal to the gross wage. In the standard case with NDC and FDC, 12.22% is paid into the main NDC account, 4.38% into the individual NDC sub-account (the value of which can be inherited), and 2.92% into the FDC account. However, as of 2023, the option to set up an FDC account is voluntary in an opt-in system. While the overall contribution rate remains unchanged, there is an option (for those who have not opted for the funded pillar) to accumulate the remaining 7.3% in the individual NDC subaccount. The ceiling on contributions and pensionable earnings is set at 2.5 times the average monthly wage. The general pension system also covers the self-employed. The effective accrual rate for a man is comparatively low at 0.71% for average earners. The pension is calculated on the basis of lifetime earnings. The NDC accounts are indexed differently: the first is indexed to the growth of the covered wage bill and not less than price inflation. The subaccount is indexed annually by the average annual growth rate of GDP in current prices over the last 5 years.

However, from the end of November 2022, certain changes have been made to the second- and the third-pillar pensions, including the complete abolition of the second-pillar FDC scheme and the option to transfer the assets either to the NDC account or to a third-pillar scheme. For more information, see Section 2.10.4.

2.10.3. PAYG and fiscal challenges

Public Expenditure

Public spending on pensions is relatively stable and currently stands at around 10.6% of GDP (Figure 48), just above the OECD average of 9%. However, it accounts for 25.6% of total government expenditure (2017), which is higher than the OECD average and one of the highest levels among the countries analyzed. The old-age poverty rate, defined as the percentage of the population with an income below 50% of the median equivalized household disposable income, is around the OECD average at 12.8% and is significantly higher than the poverty rate of the total population at 9.8% in 2018. For older women, old-age poverty is significantly higher than the overall poverty rate at 15.8% - related to lower retirement ages and longer periods of childcare. This is related to replacement rates, which are on average very low: the (gross) replacement rate for a man earning the average wage is 31.8%, falling to 30% for a man earning twice the average wage. For women, the figures are 31.9 and 22.8, respectively (OECD, 2021). The OECD averages are 51.8 and 44.4, respectively (OECD, 2021). Gross pension wealth accumulated over a lifetime is lower than in most OECD countries, ranging from 5.7 times average male earnings for low earners to 5.4 times for high earners, and from 7.3 times for low and medium earners to 5.2 times for high earners. The OECD averages are between 11.8 and 8 for men and 13 and 8.8

for women. It should be noted, however that many of the features described are the result of previous arrangements that applied to many current pensioners and were replaced by the 1999 reform.

Forecast of the public expenditure

Figure 48: Poland: Forecast of public expenditure on pensions (in % of GDP)

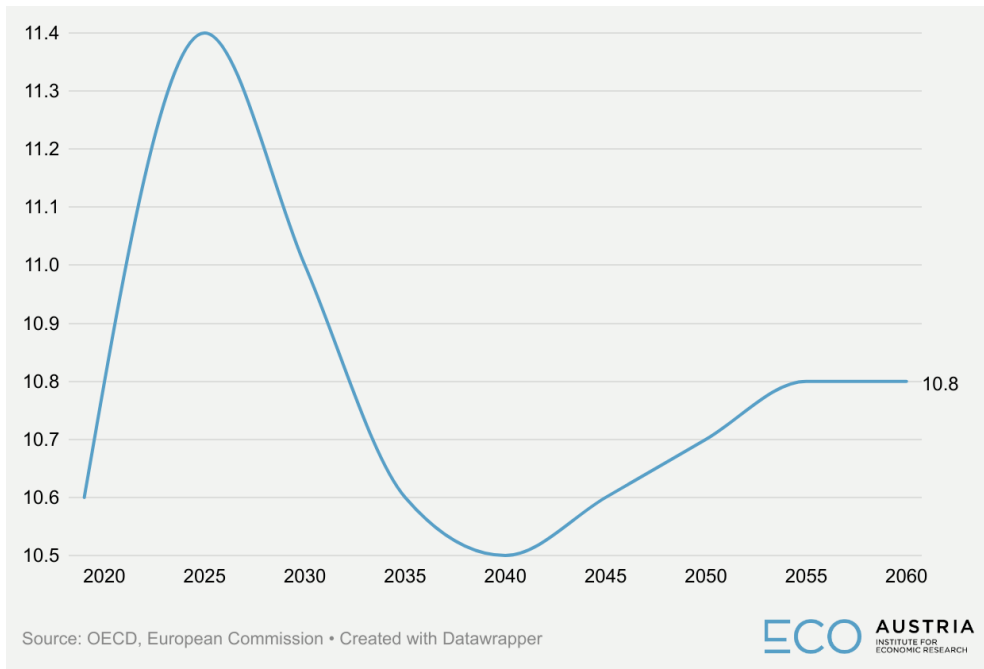
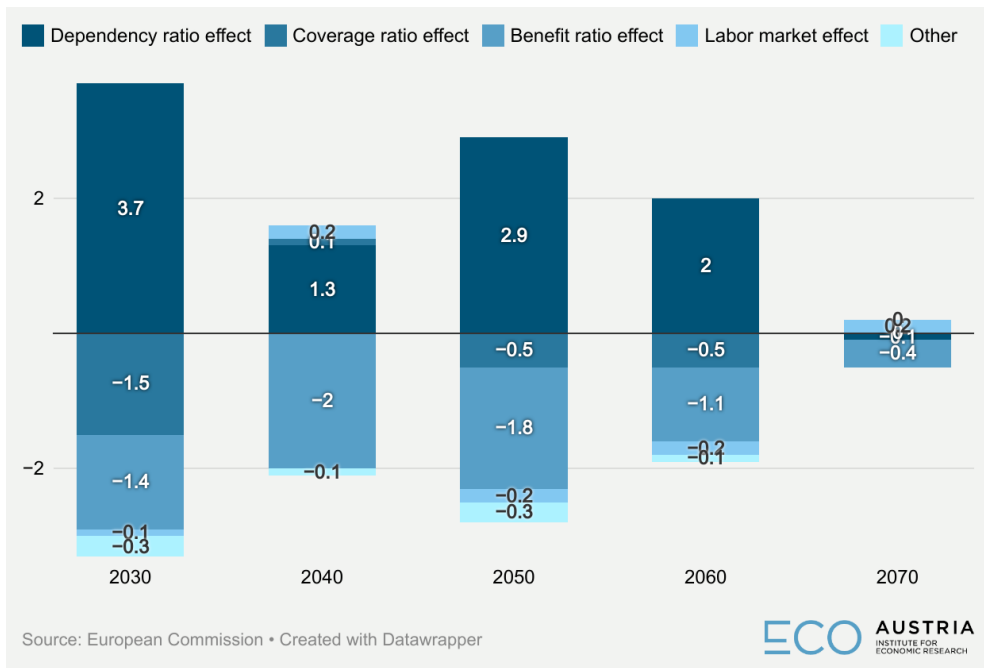


Figure 49: Poland: Components of change in the public expenditure



The ratio of gross public pension expenditure to GDP would remain broadly constant over the projection period (2019-2070). The projections show a similar declining trend at the beginning of the projection period, reflecting the replacement of pensioners with old DB system benefits by pensioners with benefits calculated according to the DC formula. Following reforms introduced in the past, all benefits from mandatory pension schemes are paid by public institutions. Recent regulatory changes are expected to stimulate the development of private individual non-mandatory pensions (see Section 2.10.4).

The driving forces behind the evolution of public spending are shown in Figure 49. According to this decomposition, the ageing of the population (rising dependency ratio) is, in absolute terms, the main driver of changes in pension expenditure over the period 2019-2070. In the absence of other adjustments to counteract the ageing process, pension expenditure would be around 10 percentage points of GDP higher in 2070 than in 2019. The increase in the total dependency ratio is projected until 2060 and will be particularly pronounced in the decades 2020-2030 and 2040-2050, reflecting the ageing of the post-war baby-boom generations (Poland AWG, 2021). Due to reforms already implemented, the ratio of beneficiaries to the population aged 65+ (the coverage effect) will not be an important channel for adjusting to population ageing. The negative contribution of this effect mainly reflects the shift in the effective retirement age, while the statutory retirement age will remain constant. The main channel of adjustment will be a decrease in the average pension relative to the average wage (benefit ratio effect). Both benefit ratios and replacement rates decline significantly over the projection period. The main reason for this decline is the adjustment of the pension formulas in the NDC system and the assumption of increasing life expectancy.

Forecast of the replacement rates

Table 26: Poland: Benefit ratios and replacement rates until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Overall benefit ratio	44%	39%	32%	26%	24%	23%	-21.0
Earnings-related benefit ratio	40%	36%	29%	24%	22%	21%	-19.0
Earnings-related replacement rate	54%	44%	30%	25%	25%	25%	-29.0

Source: European Commission • Created with Datawrapper

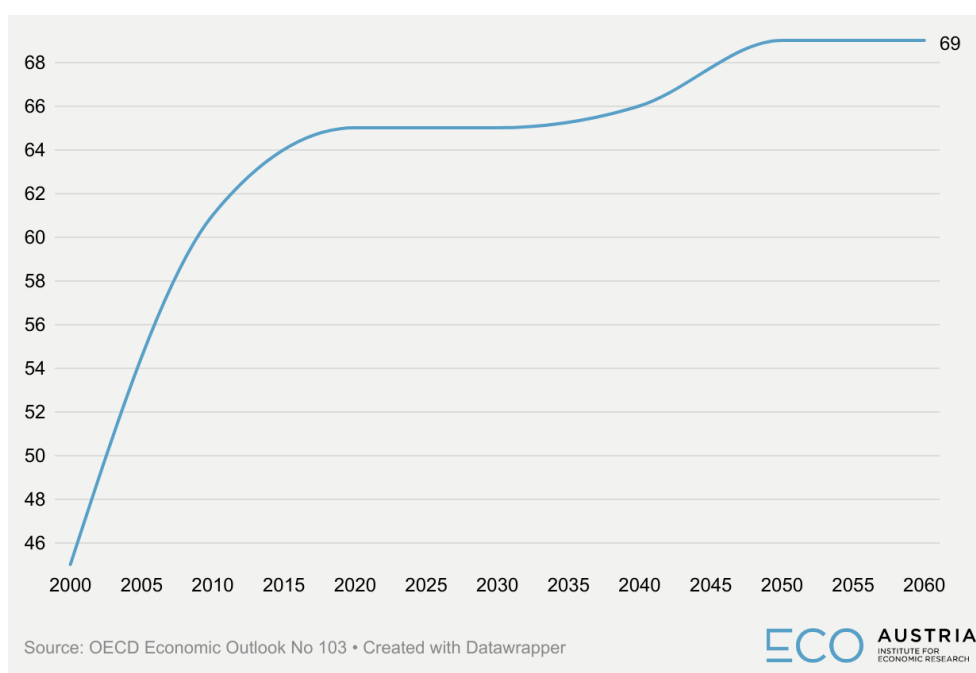
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The changes in the replacement rate and benefit ratios (which converge by the end of the projection period) are mainly due to the 1999 reform, which changed the DB system into an NDC system. As explained by the Polish AWG (2021), even though pensions are calculated based on the NDC formula from 2013 onwards, they are influenced by the so-called "initial capital" - the calculation of the capital earned before the introduction of the 1999 pension reform plus its indexation. Before calculating the pension benefit, the indexed initial capital is added to the NDC accounts of persons who worked before 1999. Before 1999, unemployment was lower than in the early 2000s. Before 1989, the phenomenon of unemployment was not even officially observed (full employment in the centrally planned economy). This explains why the projected replacement

rate falls significantly after 2030 for generations that experienced unemployment, inactivity, and an increasing number of non-standard work arrangements. Benefit ratios (the ratio of average pension expenditure per retired person to average wages in the economy) decrease throughout the projection period because this measure considers, in addition to the amount of the first pension, pensions already granted in the past and indexed significantly below wage growth.

Forecast of the debt levels

Figure 50: Poland: Projection of long-term gross financial liabilities (in % of GDP)



An increasing pressure on public finances in Poland comes from the cost of aging, which reduces the sustainability of public finances. According to the OECD long-term projections, gross financial liabilities as percentage of GDP will rise above the Maastricht debt level of 60 % and stay at this level until the end of the projection period in 2060 (see Figure 50). However, as explained below most of this pressure results from the initially bad fiscal position and costs related to long-term care and the health system rather than the pension system.

The S2 indicator measures the permanent adjustment in the structural primary balance (SPB) in 2024 that would be required to stabilize government debt in the long term. It consists of two components, namely (i) the "initial budgetary position", which measures the gap between the initial SPB and the debt-stabilizing structural primary balance, and (ii) future ageing costs. Poland appears to be at medium risk, with an S2 indicator of 3.7% of GDP, mainly due to the initial (weak) budgetary position (2.1 percentage points). Other risks stem from the long-term cost of health care and long-term care, each contributing 1.2 percentage points. The pension system makes a negative contribution of -0.7 percentage points to the S2 indicator, meaning that the sustainability of the pension system does not pose a risk to the country's fiscal sustainability, but this is a consequence of the generally low adequacy of the system. The structural primary balance required to achieve fiscal consolidation is 2.3% of GDP, compared to -1.4% projected for 2024,

and the European Commission assesses the plausibility of achieving this target (based on past projections) as zero.

The S1 indicator measures the permanent fiscal effort required in 2024 to bring the debt ratio down to 60% of GDP by 2070. The S1 indicator consists of three components, namely (i) the "initial budgetary position", which measures the gap between the 2024 SPB and the debt-stabilizing structural primary balance, (ii) the debt requirement, which is related to the distance of the current debt ratio from the 60% reference value, and (iii) future ageing costs (DG-ECFin, 2023). Poland's S1 indicator is 2.8%, indicating a medium level of fiscal risk, mainly driven by the initial budgetary position (contributing 2 percentage points), pensions (-0.6 percentage points), health care (0.8 percentage points) and long-term care (0.7 percentage points). Also in this case, the long-term sustainability of the pension system is not at risk. The implied structural balance in 2024 is 1.4% of GDP, compared to a projected -1.4% of GDP.

2.10.4. Funded Pensions (Second and third tier)

Voluntary/Mandatory, Occupational/Personal, Book reserves

As mentioned above, the public NDC scheme has been the default option since 2014. Employees can opt to contribute 2.92% of their gross wages to the privately administered second-tier FDC scheme.) As the system has undergone many reforms, the following statistical information reflects, to a large extent, the impact of previous regulations in an international comparison. Another important element of the 2014 reform was the introduction of the so-called "suwak" (slider) to limit the risk of leaving the fund at a particularly unfortunate time (e.g., during an economic crisis). The so-called "safety slider" mechanism currently in place involves the gradual transfer of funds from the Open Pension Fund to the Social Security Fund, starting 10 years before a member of the Open Pension Fund reaches the individual retirement age. While this is intended to reduce the risk for retirees, it has the effect, together with a gradual reduction in the number of new OFE members, of gradually reducing the assets under management in the funded second tier.

Additionally, there are several instruments of the third-tier funded pension schemes. All supplementary pension plans operating in Poland are based on a pure defined contribution (DC) formula. The third pillar of Polish pension system consists of two elements: the individual part and the occupational part and comprises four institutional elements: – employee pension plans (PPE) introduced in 1999, – individual retirement accounts (IKE) in operation since 2004, – individual retirement protection accounts (IKZE) offered since 2012, – employee capital plans (PPK), which have been gradually introduced since mid-2019 (Rutecka-Góra, 2020).

The Employee Pension Schemes (*pracownicze programy emerytalne*-PPE) were the first to be established (in 1999) and may operate in the form of collective (group) unit-linked life insurance (the most popular form), an agreement for payment of contributions to an investment fund, an employee pension fund and foreign management. The individual pension schemes may operate in the form of individual pension accounts (*indywidualne konto emerytalne* - IKE), introduced in 2004, or individual pension savings accounts (*indywidualne konto zabezpieczenia emerytalnego*-

IKZE), introduced in 2012, which differ in the limit of contributions paid and the type of tax incentives offered. Most of the solutions (PPE, IKE and IKZE) are based on the voluntary creation of accounts and enrollment in the program. In PPK, on the other hand, the employer is obliged to set up programs, combined with an automatic enrolment mechanism. Subsequently, more types of companies (starting with the largest) will be obliged to set up savings plans for their employees. By the end of 2021, 2.54 million people will be covered by the PPK, representing about 15% of the workforce.

Employee pension schemes (PPE) operate in a form of group unit-linked life insurance, investment funds, employee pension funds or in a form of funds under foreign management. Employee capital plans (PPK) are offered as target-date funds, i.e., a range of funds is available with an investment strategy adjusted to different time horizons of saving tailored to the age of the saver. IKE and IKZE use the same economic mechanisms and operate in the following forms: unit-linked life insurance, investment funds, a bank account, an account at a brokerage house, a voluntary pension fund.

Still relatively high coverage rates are the result of past regulations that made OFE membership mandatory. For example, Poland has the highest coverage of voluntary personal plans among countries with similar institutions, at 65.7% - but this is due to the recent change of the plan to a truly voluntary form. Coverage in auto-enrolled plans (corresponding to the newly established PPKs) was 11% in 2021 (OECD, 2022) and about 15% in 2022 (Kluzek, 2022).

Investment regulations

OFE investments are regulated by the Act on the Organization and Operation of Pension Funds (Ustawa z dnia 28 sierpnia 1997 r. o organizacji i funkcjonowaniu funduszy emerytalnych, Dz.U. 1997 nr 139 poz. 934). There are strict regulations regarding the maximum amount of capital in individual issuers, ranging from 5 to 40% depending on the asset class. The limit for investments in foreign currencies is 30% of assets. In addition, as of 2014, the law explicitly prohibits investments in government bonds and other debt instruments guaranteed by the Ministry of Finance. In addition, investment in certain other financial instruments is limited (e.g., municipal bonds to a maximum of 40%). Direct investment in real estate is prohibited (see, Survey, 2022), direct investment in retail mutual funds is limited to 15%, and bank deposits are limited to 20%. These regulations, together with OFEs' significant exposure to shares listed on the Wasraw Stock Exchange (WSE), result in OFEs' investment performance being highly dependent on the economic situation of the WSE. The Financial Supervisory Authority (KNF) publishes the investment portfolios of all OFEs on a monthly basis, e.g., here for May 2023.⁴⁰

Other rules apply to the occupational plans (PPE). Unlike for the case of OFE, investment in treasury bonds is not prohibited and limits on other assets classes are less strict, with only prohibition of real-estate funds and direct investments in private investment funds. There are some limits on private bonds, with a 40% limit on corporate bonds and mortgage bonds and 15% limit on non-listed mortgage bonds. Investment activities are restricted to assets from the European Union, European Economic Area and OECD countries, and the assets denominated in

⁴⁰ https://www.knf.gov.pl/?articleId=82745&p_id=18 Information available in English.

foreign currencies cannot exceed 30% of the overall value. Limits also apply to assets allocated with single issuers lying between 5 and 10% for most asset classes and at 100% for bills and bonds issued by public administration.

Finally, for the Employee Capital Plans (PPK), there are complex rules that define the investment strategies and depend on the life cycle of the fund (which depends on the age of the beneficiary). As with other instruments, direct investments in real estate and private investment funds are prohibited. As the age of the beneficiary increases, the funds are obliged to invest less in equity and more in debt instruments (bonds, etc.), according to the following scheme: for persons under 40 years of age: 60-80% equity, 20-40% debt; for persons between 40 and 50 years of age: 40-70% equity, 30-60% debt; for persons between 50 and 55 years of age: 25-50% equity, 50-75% debt; for persons between 55 and 60 years of age: 10-30% equity, 70-90% debt; and finally for persons over 60 years of age: max. 15% equity and at least 85% debt. Similar rules apply to other instruments, depending on their nature (debt or equity). Investments are limited to the currencies of the EU and OECD countries, with a maximum of 30% of assets denominated in foreign currencies. For equities, at least 20% must be invested on the stock exchanges of OECD member states other than Poland. Single issuer rules apply.

Assets allocated

Although the coverage of the FDC system (previously mandatory and not voluntary) is still high, since only a small part of the income was allocated to the second tier and the third tier was relatively insignificant until now, the amount of assets under management is generally low and declining since the abolition of the mandatory second funded tier. In 2021, assets amounted to 8.9% of GDP, while in 2013 (the last year before the OFE reform) they reached 18.8%. Due to the relatively unregulated market and high competition among pension providers, most of the assets are invested in riskier assets such as equities, and the proportion of assets invested in equities in Poland is the highest among OECD countries, at 91%. The other reason for this extraordinarily high share is the fact that (see above for details) open pension funds are prohibited from investing in government securities. The rest consists of six percent bills and bonds and 2.9% other classes. Most of the capital is invested in Poland, with only about 10% invested abroad (OECD, 2022).

Other instruments (or their investment rules) have higher proportions of bonds and bills, but these do not change the overall picture much due to the still relatively small volume of assets.⁴¹

Investment performance

According to the information presented by the Polish Financial Advisory on the 27th of April 2023⁴² performance of OFEs in the last years was good. In the last 36 months the weighted average of all funds was nominally at 47,158%. For the last ten years it was at 36,950%. While it is impossible to calculate a geometric average due to periods of negative real returns, the (arithmetic) real average return in the years 2001 to 2021 was at 3.3% per year. Despite periods of negative

⁴¹ See KNF 2018: https://www.knf.gov.pl/knf/pl/komponenty/img/INV_OFE_3L_20180330_62462.pdf retrieved on the 6th of July 2023.

⁴² https://www.knf.gov.pl/knf/pl/komponenty/img/Informacja_dot_OFE_z_dnia_27_kwietnia_2023_81931.pdf

returns, the cumulative real return on investment between 2001 and 2021 was at 75.6% (OECD, 2022). According to the preliminary data for 2022, real investment rate was negative at -29%, and as such, one of the lowest in the OECD (OECD, 2023). Nevertheless, the overall performance of the last 20 years was much above the inflation rates.

The PPK plans are newly established, thus, long-term performance indicators are not yet available. Rates of return for the last 36 months can be already analyzed.⁴³ The funds had a rate of return of between 4.07 and 41.85%, with an average return of 24.3%, which due to currently high inflation is negative in real terms but in the long run will likely outperform the inflation rates.

The voluntary occupational plans within IKE and IKZE have been performing similarly to other plans, as their asset compositions are quite similar and mostly relying on equity.

Tax treatment

Almost all third-tier solutions are offered under the approximate TEE tax regime, which means that contributions are taxed, and investment returns and benefits paid are exempt from tax after a certain age.

Contributions into IKE are taxed at the marginal rate of income tax in the sense that contributions are made from after-tax earnings and do not benefit from tax reliefs. Annual contributions into IKE cannot exceed 300% of the national projected average monthly salary. IKE savers are not entitled to income tax credits on their income in subsequent years. The tax advantages of this form of saving are only available when the taxpayer reaches the age of 60 (55 in certain cases) and other conditions are met. Withdrawal of the funds does not entail the obligation to pay capital gains tax. On the other hand, requesting the return of funds from the IKE, i.e. withdrawing them before fulfilling the conditions of the law, means the necessity to pay capital gains tax.

In the case of PPKs, the rule is that the funds deposited there have already been taxed, regardless of whether they were financed by the employer or the saver. The taxpayer is not entitled to a tax credit for contributions to the PPK, although he benefits from it in a certain sense, since the welcome payment from the state budget and the annual surcharges derived from this source are not taxed in any way. The withdrawal of the funds is also not taxed if one of the legal conditions is fulfilled. Heirs are not taxed either. As a further incentive, the government pays a PLN 250 contribution in the PPK account when the member joins the plan. It also contributes PLN 240 annually in the PPK account

Different rules apply to Individual Retirement Protection Accounts (IKZE), which offer tax deductibility for contributions, while withdrawals after the age of 65 are taxed at a preferential rate of 10% (withdrawals before the statutory retirement age are taxed at the regular rate). This is roughly equivalent to an EET(PE) plan. Due to the tax relief in all institutional forms of funded schemes, upper limits are applied to contributions, expressed as percentages (in PPE and PPK) of an individual's wage or as amounts (in IKE and IKZE, such a limit is also possible in PPE) (Rutecka-Góra, 2020).

⁴³ See e.g., <https://www.biznesradar.pl/fundusze-stopy-zwrotu/ppk> retrieved on the 6th of July 2023.

Employer contributions into PPE (so-called basic contributions) are included in the taxable income of the employee and consequently taxed at the marginal rate of income tax. Employee contributions (so-called additional contributions) are paid from earnings that have been already taxed. Employee contributions into PPE cannot exceed 450% of the national projected average monthly salary.

Returns on investments are not taxed. Early withdrawal from IKE, IKZE and PPK is possible, but in this case returns on investments are taxed at 19%. IKZE benefits can be paid after age 65 as lump sums or regular payments and are taxed at a fixed rate of 10%. Early withdrawal is possible, but all accrued tax benefits must be surrendered. Any withdrawal after 60 from PPE, PPK or IKE is tax free. At least 75% of PPK savings should be paid in at least 120 monthly instalments. Early withdrawal from PPE is not possible. Early withdrawal from IKE is possible but, in this case, returns on investments are taxed at 19%. Early, unconditional withdrawals from PPK are possible but in that case, returns on investments are taxed at 19%, 30% of the funds paid by the employer are transferred to ZUS, and state contributions are transferred back to the state budget.

To stimulate the employment of older workers, from 2022 onwards, an income tax rebate will be introduced for persons who have reached the statutory retirement age. Such persons will not pay tax on income from employment, contract work or business activity up to the amount of PLN 85,528 per year. In addition, working senior citizens who do not receive a pension and are paid according to the tax scale will pay tax only on income exceeding PLN 115,528 (compared to the regular taxation of 12% on income above PLN 0 with a tax deduction of PLN 3,600 and 32% on income above PLN 120,000). There are no limits on employment during retirement, which would result in a reduction of pension benefits (above the statutory retirement age).

2.10.5. Highlights and main features of the system

1. Strengths and weaknesses (according to Overall Pension Index – OPI)
<ul style="list-style-type: none"> - The Polish pension system shows good results with regard to “Sustainability” (with an OPI score of 0.85 and ranked 4th among 11 countries). However, the overall pension system seems not very generous and provides only moderate pension levels. Poland shows potential for improvement as regards “Adequacy” (OPI score 0.49, ranked 10th among 11) and “Market capitalization” (OPI score 0.04, ranked 10th among 11). - The system is characterized by a variety of PAYG-NDC and funded elements. Only basic elements are PAYG and tax-financed, the overall pension system therefore appears affordable and sustainable, but – as mentioned – not very generous.
2. Tax treatment
<ul style="list-style-type: none"> - 2nd tier: PPK and PPE regime follows TEE, at marginal income tax rate; 3rd tier: OFE ad IKZE plans follow EET regime, IKE plan follows TEE regime. Contributions into OFE are tax deductible, while this only partly applies to IKZE to a certain threshold. Contributions to IKE plans are not tax relieved
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - As regards the 2nd tier FDC scheme, OECD reports minimum contributions of 3.9% of earnings, if employees opt into the FDC scheme (Pension Markets in Focus 2022, 20). Of this, 2% is paid by the employee and 1.5% by the employer. Employers and employees have the option of making additional contributions of up to 2.5% (for employers) and 2% (for employees).
4. Asset Allocation
<ul style="list-style-type: none"> - In the year 2022 according to OECD: Equities (91.0%), Bills & Bonds (6.0%), Cash & Deposits (1.6%), Other* (1.3%) <p>* Assets invested in loans, real estate (land and buildings), unallocated insurance contracts, private investment funds and other alternative investments.</p>
5. Obligatory character
<ul style="list-style-type: none"> - OFE, IKZE & IKE plans: voluntary - PPK plan: automatic enrolment for employees aged 18-54, participants have to individually opt out - PPE plan: ased on employers’ choice or collective agreement
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - OFE plan: life-long monthly annuity - PPK; IKZE, IKE& PPE plans: monthly annuity or lump-sum
7. Contributions to funded plans as percentage of GDP
<ul style="list-style-type: none"> - According to OECD Pension Markets in Focus 2022 (OECD 2023) the volume of contributions to all forms of funded schemes was only 0.6% of GDP in 2021.
8. Investment performance
<ul style="list-style-type: none"> - According to time-series data in OECD Pension Markets in Focus 2022 (OECD 2023) the average investment rate of return from 2011 to 2021 was 1.0%. - At the same time the OECD average was 3.7%.

Additional information and results

- The second tier is a pure NDC system that is subject to demographic risk.
- Public spending on pensions is not expected to increase significantly, as replacement rates are expected to decline significantly.
- The first- and second-tier systems are not very adequate, resulting in comparatively high levels of old-age poverty.
- The third tier consists of various products, all based on the principle of defined contributions.
- Most assets in the second-tier FDC and third-tier plans are allocated to equities, resulting in comparatively higher returns but also higher risk for participants.

2.11. Sweden

2.11.1. Demographic profile and demographic forecast

Table 27: Sweden: demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	10,276	11,131	11,722	12,280	12,727	13,082	10,276 → 13,082
Population growth rate	1.0	0.6	0.5	0.4	0.3	0.3	1.0 → 0.3
Old-age dependency ratio (pop 65+ / pop 20-64)	35.2	38.4	41.2	43.0	48.4	49.8	35.2 → 49.8
Old-age dependency ratio (pop 75+ / pop 20-74)	13.6	17.3	18.5	20.6	21.9	25.2	13.6 → 25.2
Ageing of the aged (pop 80+ / pop 65+)	25.8	33.7	33.8	37.2	36.9	40.4	25.8 → 40.4
Men - Life expectancy at birth	81.4	82.5	83.7	84.8	85.8	86.8	81.4 → 86.8
Women - Life expectancy at birth	84.7	85.9	87.1	88.2	89.3	90.3	84.7 → 90.3
Men - Life expectancy at 65	19.7	20.4	21.3	22.2	23.0	23.7	19.7 → 23.7
Women - Life expectancy at 65	22.0	22.9	23.9	24.8	25.7	26.6	22 → 26.6
Men - Survivor rate at 65+	90.2	91.6	92.6	93.6	94.4	95.1	90.2 → 95.1
Women - Survivor rate at 65+	93.6	94.5	95.3	95.9	96.4	96.9	93.6 → 96.9
Men - Survivor rate at 80+	64.9	69.4	73.0	76.3	79.2	81.8	64.9 → 81.8
Women - Survivor rate at 80+	75.9	79.6	82.5	85.0	87.2	89.1	75.9 → 89.1
Net migration (thousand)	66.7	52.1	45.5	39.8	35.1	30.3	66.7 → 30.3
Net migration over population change	0.7	0.8	0.8	0.8	0.9	0.9	0.7 → 0.9

Source: European Commission • Created with Datawrapper

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For Sweden, following the demographic forecast (Table 27), an increase of the total population from 10.3 million in 2019 to 13.1 million in 2070 is expected, even though population growth is predicted to stall from 1.0% today to 0.3% in 2070. This increase can be explained by other factors, being the migration to the country and the increased life expectancy and hence the increased population longevity. This latter increase in longevity will have substantial influence on the age composition of the Swedish population, as both the conventional old-age dependency ratio (population aged 65+ over population 20-64) and the “ageing of the aged” ratio (population aged 80+ over population aged 65-79) are subjected to increase drastically, both increase by roughly 15 percentage points from today till 2070 (EU, 2020c).

Life expectancy indicators all increase throughout the forecast period, with the life expectancy at birth increasing by roughly 5 years for both men and women, from 81.4 to 86.8 and 84.7 to 90.3 years in 2070 respectively. Similar trends can be observed for the life expectancy at 65 and the survivor rate at 65+. Men are projected to live another 23.7 years when they reach the age of 65 in 2070 opposed to 19.7 years today. Analogously, 95.1% of men will survive the age of 65, compared to 90.2% today. For women, the pattern is similar, they will projectably live another 26.6 year when they reach the age of 65 in 2070, while that number is 22 years today. 96.9% of women will survive the age of 65, while today, 93.6% do. For the survivor rate at 80+, a larger discrepancy in the change for men and women can be seen, while only 64.9% of men today survive the age

of 80, in 2070, 81.8% will survive that age. For women, 75.9% already survive that age today, in 2070, this survivor rate will be 89.1%. Net migration to Sweden does change drastically throughout the projection period, however on very low levels, it will decrease from 66,700 today to 30,300 in 2070 (EU, 2020c).

Table 28: Sweden: exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labour market exit age (CSM) - Men	65.6	65.6	65.6	65.6	65.6	65.6	65.6 — 65.6
Duration of retirement - Men	18.7	19.6	20.4	21.3	22.1	22.8	18.7 — 22.8
Percentage of adult life spent in retirement - Men	28.2	29.2	30.0	30.9	31.7	32.4	28.2 — 32.4
Early/late exit - Men	2.8	2.5	2.0	2.3	2.0	1.9	2.8 — 1.9
Average labour market exit age (CSM) - Women	64.5	64.6	64.6	64.6	64.6	64.6	64.5 — 64.6
Duration of retirement - Women	22.7	22.9	23.9	24.8	25.7	26.6	22.7 — 26.6
Percentage of adult life spent in retirement - Women	32.8	32.9	33.9	34.7	35.5	36.3	32.8 — 36.3
Early/late exit - Women	2.3	3.2	2.6	3.0	2.5	2.3	2.3 — 2.3

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

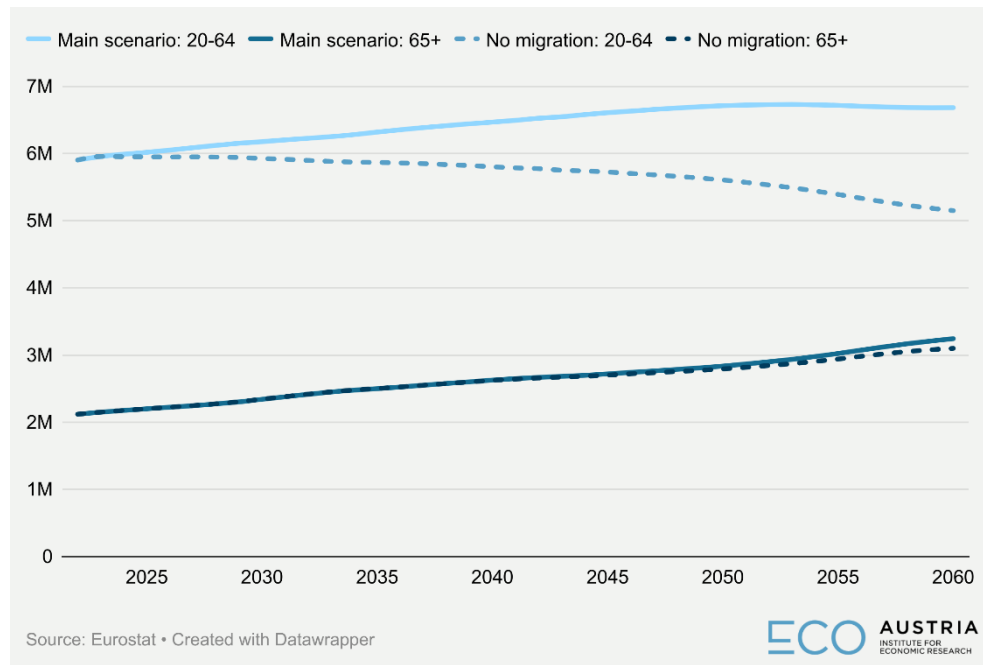
Source: European Commission • Created with Datawrapper

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Even though the life expectancy in Sweden increases significantly, the average labor market exit age is not expected to change until the end of the projection in 2070 for neither men nor women (Table 28). For men, this indicator remains 65.6 years for the projection period, for women it is 64.6 years. This unchanged labor market exit age in turn has an influence on the duration of retirement considering the increased the life expectancy. Men will spend on average 22.8 years in retirement in 2070, which equates to 32.4% of their adult life. This is an increase compared to today, as retirement on average lasts 18.7 years, being equal to 28.2% of adult life. For women, due to their higher life expectancy, duration in retirement increases from 22.7 years today to 26.6 years in 2070, which then makes up 32.68% and 36.3% of their adult life, respectively. As for early and late exits, the early to late exit ratio fluctuates slightly for women around 2.3 today, with the highest ratio values projected in 2030 and 2050 with 3.2 and 3.0 respectively. For men, this ratio decreases from 2.8 today to 1.9 in 2070, signifying that less men leave the labor market early or more men defer retirement (Table 28).

The role of migration

Figure 51: Sweden: demographic forecast with and without migration (2022-2060)



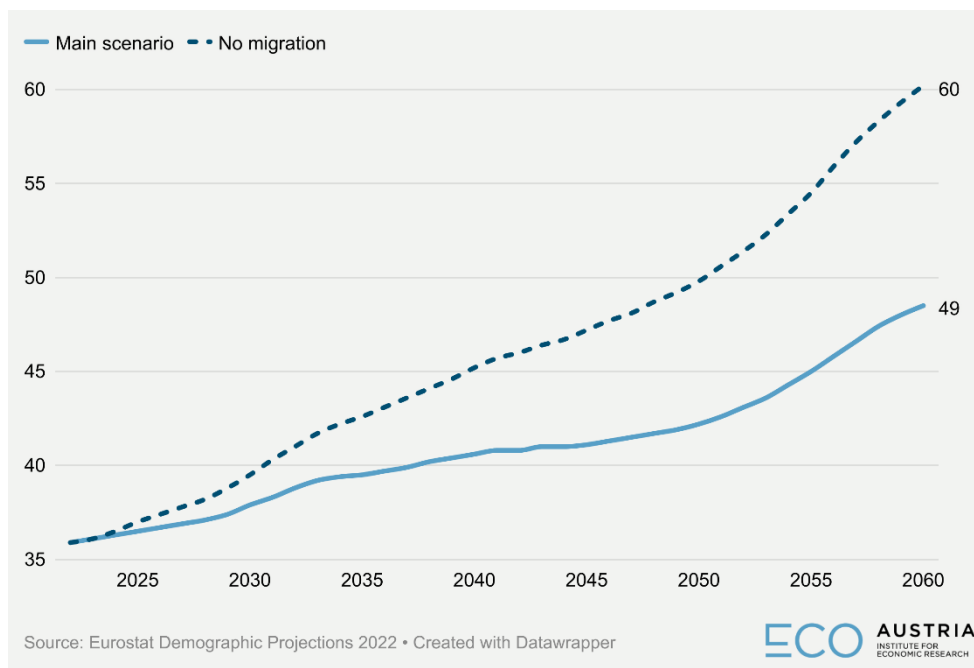
Migration has a considerable impact on the development of the age composition for Sweden. For the population share aged 65+, the effect of migration is negligible, as the scenarios with and without migration differ by about 144,000 individuals or 4.5% in 2060 (Figure 51). For the population share that roughly represents the working age population (20-64), the effect of migration must be mentioned. Without migration, this population share drops to 5.2 million inhabitants, while in the scenario with migration, this population share will be 6.7 million in 2060. This difference of 1.5 million inhabitants corresponds to 23% of the working age population. It is important to note that for the development from today on, Sweden starts off with a population share of inhabitants aged 20-64 of 5.9 million in 2022, thus only with migration, this share can be increased, without migration, this population share slightly decreases.

These opposing trends in population shares in the scenario without migration also have an influence on the significant difference in old-age dependency ratios of the scenarios. While the old-age dependency ratio for the scenario without migration is 60, it is 49 for the scenario with migration (Figure 52). This is due to the more similar trends in population shares in the scenario with migration, the absolute difference in inhabitants only decreases by 345,000 inhabitants from today till 2070. For the scenario without migration, this decrease in absolute difference between the shares is much stronger with 1.7 million inhabitants. The old-age dependency ratio signifies that for every person in the age cohort of 65+, there will be approximately 2.04 persons of working age in the scenario with migration, without migration, only 1.67 individuals correspond to one person in the population share aged 65+.

If it was of relevance, to keep the old-age dependency ratio of 2022 constant over the projection period, one can calculate the necessary migration (or return of expatriates), which is needed to

join the working age population in order to hold the old-age dependency ratio of 35.9 constant. The working age population of 2060 in the scenario with no migration is projected to be 5.15 million. For the old-age dependency ratio to be 35.9, a working-age population of 8.63 million would be required. Assuming an equal fertility rate and age structure for the migrant population, as well as migrants being predominantly in working-age, migration of 3.48 million individuals would be necessary. About 92.000 individuals on average would need to migrate to Sweden every year, to achieve this result during the projection period.

Figure 52: Sweden: old-age dependency ratio (65+/20-64) un the main scenario and without migration



2.11.2. General architecture

The pension system of Sweden can be classified by three tiers with respective subcomponents (EU, 2020c; Schneider, Petrova & Becker, 2021):

- As regards **1st tier** pensions, there is a tax-financed minimum benefit targeted at individuals with no or a very low earnings-related pension. The guarantee pension (*garantipension*) is pension-income-tested minimum top-up. Persons must have lived in Sweden for a minimum of three years with 40 years of residence being required for a full guarantee pension. The pension is reduced proportionally for those with shorter residence periods. For individuals, with a full employment biography but low earnings-related pension, there is also the tax-financed supplement to the earnings-related pension (*inkomstpensionstillägg*).
- The old-age earnings-related system (**2nd tier**) is based on two subcomponents. One part is a PAYG component, the income pension (*inkomstpension*). It is based on notionally defined contributions (NDC). The other part is a fully funded, defined contribution (FDC) component (*premiepension*). The latter gets attributed to private savings in the national

accounts, albeit being mandatory, i.e., they both get paid into separate individual accounts. Pensioners from older cohorts (born 1938-1953) also receive a supplementary income-based pension (*tilläggpension*).

- Beside the universal mandatory system, there are semi-mandatory occupational pension schemes (**funded 2nd tier**), which can both be PAYG and funded, and voluntary private schemes (**third tier**).

Qualifying conditions

Principally, all individuals that have lived or worked, both employees and self-employed, in Sweden are covered by the public pension scheme, as it is a universal mandatory system. The retirement age for the earnings-related pension schemes is flexible up from 62 years old, meaning that individuals can claim pension benefits from this age onwards, without having to stop working. For the guaranteed pension and its supplement, the retirement age is 65. As for other conditions, the old-age earnings-related pension and the premium pension (*premiépension*) have no other requirements besides the retirement age, there is no concept of a complete insurance period that leads to a “full claim”. This underlines the flexibility of the Swedish pension system, both in terms of early claims and unlimited pension deferral. Pension eligibility is not tied to nationality in any way.

Contrastingly, for the guaranteed pension, a full pension is awarded for 40 years of residency in Sweden. For the corresponding earnings-related supplement, 30 to 40 years of pensionable income are required, the exact number depends on the birth year of the pensioner. Lastly, individuals qualify for the supplement only if their income is equal or below a certain minimum income⁴⁴. Pensionable income also includes transfers from various parts of the welfare system, e.g., unemployment, sickness, or parental leave (EU, 2020c).

Current and future retirement age

Retirement is possible from the age of 62 regarding the earnings-related pension and 65 for the guaranteed pension. The age of 62 is not a statutory retirement age, in fact, most individuals start claiming benefits at roughly 65 years old, which is the former statutory retirement of the reformed pension system. That is because the accumulated pension capital will be higher by postponing, due to the shorter expected pay-out period based on unisex cohort life expectancies at retirement.

From 2026 on, the retirement age will be tied to a retirement age recommendation. This recommendation will be calculated annually based on the life expectancy. For the years 2026-2028, the recommendation was set at 67 and calculated based on 2020-2022, i.e., the calculation comes to effect six years after calculation (EU,2020c).

First-tier minimum pensions and the public NDC second-tier pensions

The guarantee pension (“Garantipension”), which is non-earnings related and financed by general tax revenues, provides for first tier pensions. The requirements for this pension are restricted to

⁴⁴ This minimum income threshold is calculated with the price basic amount (prisbasbelopp). This amount is determined every year based on changes in the general price level and used to adjust and determine taxes, benefits and other thresholds in the Swedish welfare system as an economic reference point.

the years of residence. The benefits are proportionally reduced by the years not lived in Sweden. Recipients must live in Sweden or the EES area and are eligible for benefits from 65 years onwards. Together with the housing supplement for pensioners (BTP, bostadstillägg), it is means-tested against public pension income and survivor benefits, income from work is exempted. For higher incomes, the guaranteed pension gets phased out stepwise until it is fully phased out at the 3.07-fold of the price base amount (prisbasbelopp) for singles and 2.72 for cohabitants. Similarly, to the other pension schemes, the guarantee pension is price indexed, but also fully taxed. An exception is an additional tax-free means-tested program, which is usually targeted at very low-income household with few years of residence in Sweden. Both the latter and the guarantee pension by design lead to incomes higher than generated through the general assistance benefits.

As mentioned before, the earnings-related pension scheme (2nd tier) can be divided into the notionally defined contribution component (NDC), which is PAYG, and the fully funded, defined contributions component (the FDC based “premiepension”), which is described in the following chapter 2.11.3. The payments for these two components, for which pension rights get credited, is 18.5% of the annual pensionable income, while 16 percentage points get paid to NDC systems and 2.5 percentage points to the FDC system. Payments above 8.07 the income base amount (inkomstbasbelopp⁴⁵) do not get credited with pension rights, but rather flow to the government budget as a general tax. Pensionable income is defined as earnings net of the employee contribution, which is 7%. Based on this deduction, the effective contribution of the employee and employer combined is 17,21%, of gross earnings⁴⁶. Relating back to the two subcomponents, 14,88% is allocated to the notional defined contribution system (NDC) while the remaining 2,33% go into the fully funded defined contribution system (FDC) (Pensionsmyndigheten, 2023).

The NDC PAYG public pension system gives benefits in form of an annuity that is determined by the pension assets accumulated till retirement. A divisor particular to unisex life expectancy at the specific retirement date and age is then applied to determine the benefits. This way of calculating benefits has two implications. Due to the flexibility of retirement, individuals are incentivized to defer claiming pension benefits in order to limit the negative effect of the divisor, which decreases with a later entry into retirement. Secondly, the application of unisex life expectancies in the divisor leads to higher pensions for women by about 8% opposed to a system, which is tied to gender-specific life expectancies (EU, 2020c).

The pension capital of the NDC system generally is indexed to the average earnings growth per contributor. Nonetheless, the pension benefits are front-loaded, i.e., the benefit payments are comparatively higher at the beginning of retirement and partially reflect real economic growth ahead of time. This is done to mitigate the fall in income after exiting the labour market. However, the front-loading of pensions has been paused in the years 2010-2018 following the financial crisis in 2008. To meet obligations no matter the economic and demographic development, an automatic balancing mechanism guarantees financial sustainability. It is activated when the balance ratio falls below 1, i.e., liabilities of the system are greater than assets. When applied,

⁴⁵ Similar to the price base amount, the income base amount is used as benchmark to calculate benefits and contributions.

⁴⁶ See the calculation for pensionable income: $(0,07+0,1021) / (1-0,07)=0,185$

pension balances and benefits are not indexed to income growth any longer but are rather bound to the indexation of the balance ratio. Briefly explained, the balance ratio considers one third of the deviation from 1 to calculate the “smoothened balance ratio” while still considering the increase in the income index⁴⁷. For the projection period, this automatic balancing mechanism is expected not to be relevant, as the balance ratio is assumed not to fall under 1 in suite of the 2019 pandemic (EU, 2020c).

2.11.3. Second-tier FDC components of public pension scheme

Part of the public pension scheme is also the premium pension, which is a fully funded, defined-contribution system with individual pension accounts. This FDC scheme (*premiepension*) establishes the funded component of the Swedish pension system. The FDC component supplements the public NDC PAYG component. Due to its hybrid nature, the FDC component is presented in this subchapter.

Though the system is organized by the Swedish government, the assets accumulated under this scheme fall under household savings in the National Accounts. Analogously to the public NDC scheme, benefits can be claimed from 62 years onwards, where individuals may choose a fixed or variable annuity. It is possible to allow a partner right for accumulation in terms of a survivor's protection component, which however lowers the annuity considering the expected increase in life expectancy. Pension assets accumulated from these contributions, which are 2.5% of pensionable income, can then be invested into a list of hundreds of funds or are invested in the government run default fund AP7 S afa. The latter option is a global fund portfolio made up of an equity fund and a fixed income fund. Before the age of 55, all the pensioners contributions will be put into the equity fund to allow for the higher value development. From that age onwards, a share of the accumulated savings is moved to the fixed income fund every year to allow for more secure savings (EU, 2020c).

The equity fund is classified as a high-risk global fund with a strong focus on North America, as well as ICT, finance & real estate and health care. Though the equity fund value development fluctuates over time, even stronger than the market, i.e., due to leverage through derivatives, the risk is adjusted through several factors. These include the transition to the fixed-income fund with age, the lower total combined risk of the NDC (*inkomstpension*) and the FDC (*premiepension*) components, as well as factor investing. Factor investing here refers to portfolio diversification and the selection of shares with low risk covariance. To generate higher returns than the market, the fund also engages in private equity investments. The AP7 equity fund is a global fund, with 99% of assets invested outside of Sweden, implying high currency exposure. However, as the fund's investment strategy is long-term, currency hedging is not practiced due to its related high cost. Furthermore, in the analysis of currency exposure, the NDC pension system is taken into account, which overall leads to a “strong home bias”, leading to a high domestic currency

⁴⁷ Calculation example: The balance ratio falls below 1 to 0.99, meaning that liabilities are greater than assets in the pension system. At the same, the income index increases from 100 to 104. The adjustment is then calculated as follows: $(0,99 - 1)/3 + 1 = 0,9967$. This “dampened breakeven number” is then multiplied with the income index $104 * 0,9967 = 103,66$, which thus implies, that pension balances and benefits will only be indexed to 3,66% instead of 4%.

exposure of 50-90% for savers (AP7, 2023a; AP7, 2023b). Overall, the AP7 fund is well perceived internationally for its low administration cost and its good performance on average (Seemann, 2020).

In the beginning of the 1990s Sweden entered a deep financial and economic crisis, which necessitated the rethinking of the components of the pension system. As mentioned before, the Swedish public pension system before 1998 consisted of a tax-financed minimum protection scheme and an earning-related public PAYG scheme. In the wake of the financial crisis of the 1990s, serious problems with financial stability, equivalency and long-term stability became obvious. Three main shortcomings of the old system provided the reasons for the 1998 pension reform (Scherman 1999, 7): The first was the dependence between financial performance and economic growth. The benefit formula under the old PAYG-system implied that the pension was raised in accordance with inflation, regardless of growth in the economy. In such a system, when there is low growth in the economy the pension cost as a percentage of GDP is higher than in a situation where there is high growth. The second was the design of the earnings ceiling for the calculation of pensions. The earnings ceiling in the old system was price-indexed. With real wages increasing the earnings ceiling was expected to decline in real terms. The third key rationale behind the Swedish pension reform of 1998 were costs of demographic ageing.

The development and implementation of a fully-funded FDC component within the public pension system was one of the results of the 1998 pension reform. The reform process started in 1994 with the establishment of the cross-party Pension Working Group (*pensionsgruppen*). The reform was destined to start in 1998, yet, came into full force in 2003. At its initiation, there was consensus across all parties represented in the Swedish parliament. The premium pension was initially intended to both mitigate risks associated to increasing longevity, but also, in the wake of the Swedish Financial Crisis in the 1990s, to diversify risks through investment in global capital markets. Additionally, the freedom of choice regarding the investments played a determining role of the premium pension. The underlying rationale was self-determination, meaning that insureds may have differing preferences when it comes to risk and return rates. It was thus expected that individuals would actively and constantly adjust their investment decision based on their own individual preferences. This aspect of self-determination also implied a shift in responsibility, as for the premium pension, there was no state guarantee, meaning that the individuals were carrying the investment risk themselves. This behavioural component of active investing was also deemed necessary, as only through a competitive market, the quality of the offered pension funds could have been guaranteed (Seemann, 2020).

With the implementation of this pension component, at that time, individuals had two fund options, the private fund market and state fund (*premievalsfonden*). For individuals that did not take an explicit investment choice, pension contributions were invested through the default fund (*premiesparfonden*). Compared to the private market and the state fund, the default option represented the low-risk option with greater security, as it was not justifiable to expose pensioners to a high investment risk if they did not actively make a decision. However, before being implemented, it was expected that most individuals would actively invest their pension funds due to the pursuit of higher returns on the private market. As the overwhelming majority of Swedish

insurees displayed a rather cautious approach to investment, this expectation regarding investment behaviour turned out to be overly optimistic. The majority of contributors was settling for the default option, e.g., in 2007 and 2008, 98% opted for the default option, while already 42% of existing funds were allocated to this option. This issue occurred despite the fact, that there were about 800 private funds available to choose from in 2012 (Seemann, 2020).

To combat these adverse effects, the Swedish government conducted several studies and derived multiple education and information campaigns in an attempt to increase financial knowledge and to guide insurees make an active choice. These efforts were considered unsuccessful. At the same time, the low-risk investment strategy of the default state fund led to a widening of the pension gap, which ultimately culminated in the restructuring of the premium pension. The AP7 equity and fixed income fund were introduced, which now make up the AP7 S afa as mentioned above. With the AP7 equity fund, the Swedish government intended to increase returns for the default option through a more high-risk strategy, while still giving Swedish pensioners security when they claim their benefits through the life cycle model⁴⁸. In the addition, the individual AP7 funds were made selectable besides being integrated in the default option. In order to ease making a choice, investment options with three different risk profiles were offered, containing differing compositions of equity or fixed income investments (Seemann, 2020; AP7, 2023a).

In recent years, the focus is still on enabling Swedish individuals to make better and more sustainable investment choices, with the underlying rationale to generate the highest possible pension benefits for the society overall while minimizing risks as much as possible and not guaranteeing a pension per se. The system is still confronted with regulatory issues regarding the definition of precise risk and return levels and the oversight of the private pension market. Since 2017, the premium pension fund is again in a reorganisation process, which is still focused on improving the decision-making structure and the administration of funds. The current approach foresees creating a "safe environment", in which every saver can just opt to select a preferred risk profile. At the same time, a professional fund platform is ought to be established, for those, who choose to take an active investment choice, also assuming the responsibility. It is clear that the initial rationale of self-determination has shifted towards state responsibility and security again for the sake of higher and more secure pension benefits. The state-owned AP7 fund is expected to become even more relevant, as the majority of investments will remain in this fund, while it has been increasingly marketed as a good option in recent years.

2.11.4. PAYG and fiscal challenges

Public Expenditure

The ratio of public expenditure to GDP is projected to decline slightly by 0.2 percentage points from 7.6% in 2020 to 7.4% at the end of the projection period in 2060. There are only small fluctuations over the entire projection period, with the lowest point of the projection being between

⁴⁸ The life cycle model here refers to the stepwise shift from the equity fund to the fixed income fund as the contributor ages. The goal is to secure a decent pension with lower risk, once the savers start claiming benefits. The rationale behind this is to generate higher returns in the earlier contributing years through the equity fund, increasing the probability for a higher pension in the end.

2040 and 2050 at 7.0% (Figure 53). Public pension expenditure is therefore stable in Sweden, mainly explained by the maturing mandatory private scheme. Private mandatory pensions are not part of public pension expenditure from an accounting perspective, yet, in terms of total pension expenditure, private mandatory pensions will comparatively grow in importance. From 0% in 2003, the private mandatory pensions will increase to 1.2% of GDP in 2070 through the gradually maturing of the system (EU, 2020c).

Another driving force behind the development of the public pension expenditure is the decrease in earnings-related pensions. Until 2050, the expenditure on these pensions is expected to fall due to the ageing effect. At the same time, the transition, which was based on defined benefits, to the NDC PAYG system minimize the drop in the earnings-related pensions ratio. This development is due to the fact that benefits are now based on the whole career, rather than just the 15 best years out of 30 under the old system, which has had a greater impact on pensions, particularly with regard to female labour market participation. In contrast, the minimum guaranteed pension will grow in importance in terms of expenditure, from 0.5% of GDP in 2019 to 1.0% of GDP in 2070. The slow increases of the retirement age compared to increasing life expectancies can be seen as the explanatory in this context (EU, 2020c).

To a lesser degree, the phasing out of high benefit pensions also contributes to the consistency in public pension expenditure. Even though, e.g., the widow's pension will still be paid out for several decades, the number of recipients is forecasted to decrease sharply. Similar things apply to the disability pension, where it is projected that for the next 20 years, the number of recipients of this pension will fall, before it will start increasing from 2040 onwards, due to the ageing of the population.

When it comes to poverty, Sweden is at the OECD average regarding income poverty rates (income lower than 50% of median equivalized household disposable income) of the cohort aged over 75 and of women aged over 65, only deviating by ± 0.3 percentage points. The poverty rates for each cohort respectively are 15.4 and 14.8%. Old individuals (aged >65) are more prone to experience poverty with 11.4% compared to 9.3% within the total population. Nonetheless, these rates are below the OECD average. The same applies to individuals aged between 66 to 75 with 8.5% and men aged over 65 with 7.5% (OECD, 2023).

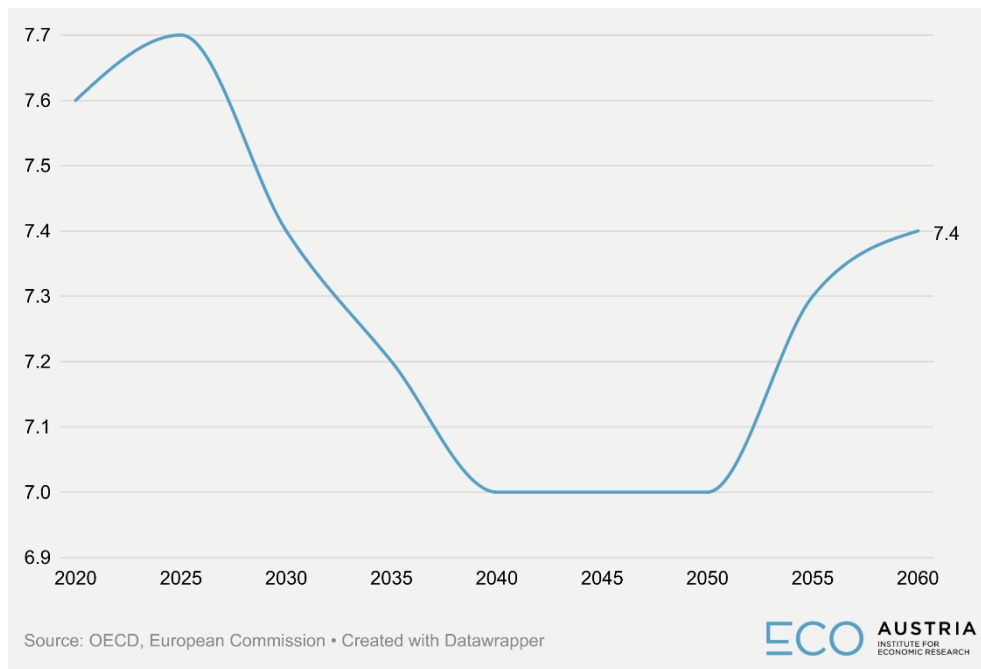
The gross replacement rate, i.e., pension income as a percentage of pre-retirement earnings, for Swedish individuals is close to the OECD average with 53.3% for both men and women in 2020. Gross pension wealth as a multiple of average annual gross earnings is also similar to the OECD average with 9.8 times the average annual earnings for men and 10.6 times the average annual earnings for women, which is a deviation by 0.1 from the OECD average. In 2021, total assets in private and funded pension plans were equal to 117% of GDP in Sweden (OECD, 2023), which is above the OECD average. Sweden is one of the countries with the highest amount of pension assets as a % of GDP.

Forecast of public expenditure

Taking into account the decomposition shown in Figure 54, it is clear that the dependency ratio effect has the strongest negative effect on public pension expenditure, meaning that public

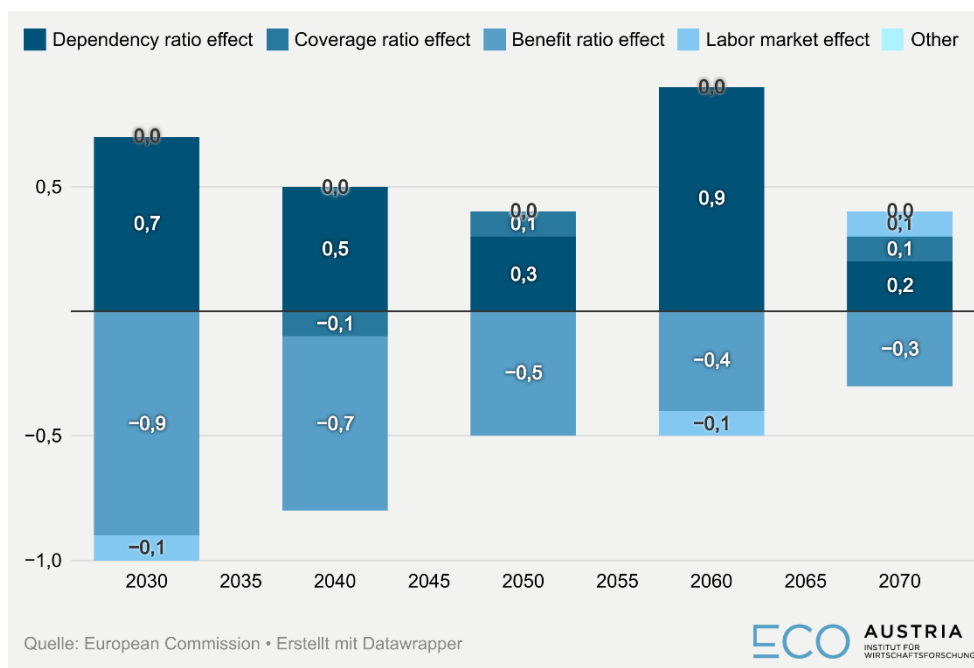
expenditure on pension as percentage of GDP is increased by it. This is due to the increasing ratio of old-age individuals against the working population. Throughout the projection period, the level of this effect slightly declines before it reaches its peak of 0.9 percentage points, which indicates that the dependency ratio effect contributes 0.9 percentage points of the total change in public expenditure on pension as percentage of GDP. Towards the end of the projection period, it must be mentioned that the effect of the dependency ratio is mitigated through the migration over the years, as well as the fertility rate remains positive, further increasing the working age population. A slight positive contribution can also be observed in 2050 and 2070 concerning the coverage ratio effect. This can be explained through the increasing numbers of cross-border pensioners, induced through migration, who typically have shorter contribution periods than the average.

Figure 53: Sweden: Forecast of public expenditure on pensions (in % of GDP)



On the other side, mainly the benefit ratio effect balances out the influence of the increase in the longevity and the dependency ratio. As the NDC PAYG pension component is calculated with a divisor, which incorporates the life expectancy at retirement, the increase in longevity is reflected and the benefit ratio falls. Less so, the employment ratio through the labor market effect helps counterbalancing the increases in public pension expenditure at the end of the projection period. The statistical reclassification of the premium pension notably also had a considerable effect on public expenditure, as the whole pension schemes was transferred from the government to the private sector from a bookkeeping point of view.

Figure 54: Sweden: Components of change in the public expenditure



Forecast of replacement rates

Both the benefit ratio as well as the replacement rate are forecasted to decrease in Sweden throughout the projection period. This is largely driven by the assumption that the effective retirement age does not change mandatorily. Even though the Swedish Government introduced the recommended retirement age, it is assumed that the effective retirement age will not change, based on the consistency and no clear trend in average first pension withdrawals in the past years. It is important to make this distinction between labor market exit and first withdrawal of pension since they do not have to coincide necessarily with each other. Even though labor market exit ages are projected to increase, first withdrawals are not. Considering increased longevity, this implies an increase in retirement duration for both men and women by 4 and 4.5 years until 2070 respectively. A longer duration of retirement leads to smaller pensions in the NDC PAYG scheme, as the annuity divisor of that systems becomes bigger.

Additionally, the phasing out of the old DB system will decrease the replacement rate. Even though this is compensated for by the shift towards the premium pension, the total benefit ratio and the replacement rate are subjected to decrease, nonetheless. Specifically, the public pension scheme is frontloaded, which on an individual basis leads to higher benefits than given by standard actuarial principles. This mean that for specific individuals, both the replacement rate and the benefit ratio decrease during the retirement.

Table 29: Sweden: Benefit ratios and replacement rates until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Overall benefit ratio	36%	32%	29%	27%	26%	25%	-11.0
Earnings-related benefit ratio	33%	29%	25%	23%	22%	20%	-13.0
Earnings-related replacement rate	42%	43%	41%	38%	37%	36%	-6.0

Source: European Commission • Created with Datawrapper

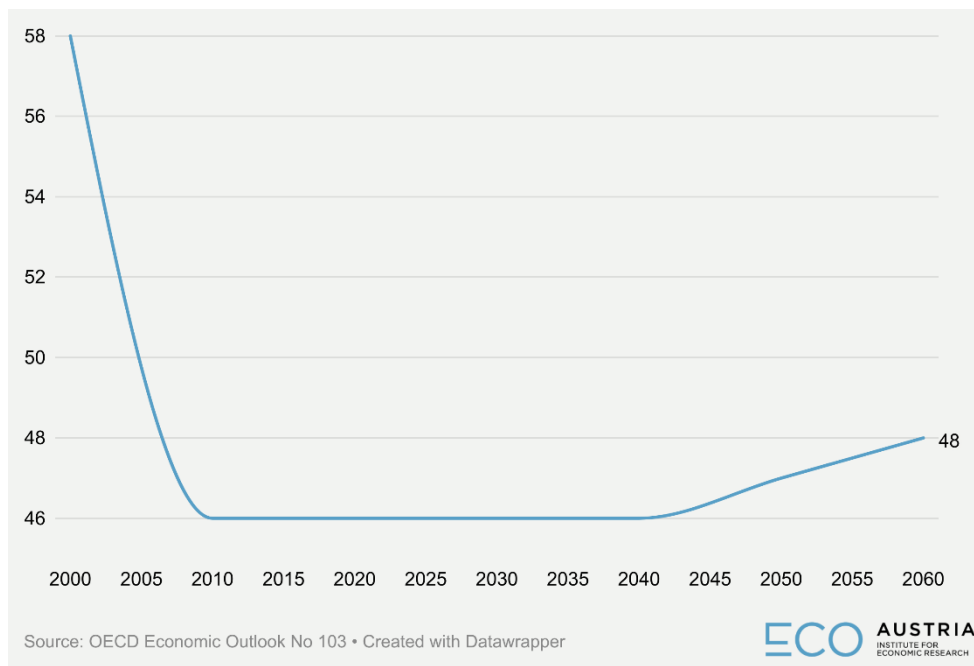
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Two components of the pensions have roughly offsetting effects on the benefit ratio and the replacement rates. As mentioned before, the premium pension scheme is projected to mature along the forecast period. Due to it being a funded system, its performance is influenced by interest rates, which influences the rates of return of the specific selectable funds. The effect of increased longevity will be limited if the interest rate is higher than income growth. Contrastingly, due to the abolishment of tax-deductions for private voluntary pensions, especially the replacement rate for this pension scheme will fall drastically. Nevertheless, this is only due to the decreased attractiveness of the scheme, individuals will, or rather must shift towards the mandatory premium system (EU, 2020c).

Forecast of debt levels

Sweden has been able to reduce its gross liabilities as a percentage of GDP from 58% in 2000 to 46% in 2010, which can be explained by various factors. In general, Sweden has been able to reduce its liabilities through sound fiscal and public debt management, as well as through structural reforms that have increased the efficiency and sustainability of public finances. From 2010 to 2040, Sweden is forecasted to hold its level of liabilities as a percentage of GDP constant at 46%. From 2040 onwards, the percentage of liabilities is subjected to rise to 48% in 2060 (Figure 55). One can use similar explanations for why public pension expenditures start to rise towards the end of the projection period. The role of increased longevity, which increases the dependency ratio, becomes the most relevant and offsets effects stemming from positive migration inflows and fertility rates (EU, 2020c).

Figure 55: Sweden: Projection of long-term gross financial liabilities (in % of GDP)



Regarding the S1 and S2 indicators by the European Commission, Sweden is well positioned. Its S1 indicator is the second lowest with roughly -4 percentage points of GDP, meaning that hardly any or no fiscal adjustment might be needed to reach the goal of 60%. The biggest component of this negative indicator regarding Sweden is its low debt requirement (debt service) and its initially good budgetary position. These components both underline Sweden's effective approach in debt management and fiscal sustainability. Regarding the S2 indicator⁴⁹, which describes long-term fiscal challenges, Sweden is positioned similarly well, having one of the five lowest S2 indicators. Its initial budgetary position once again has a positive influence, while on the other hand, its long-term projections are less favorable, as the cost of ageing is slightly positive, leading to a marginal sustainability gap. The sustainability gap and therefore the positive S2 indicator are mainly driven by the cost of ageing tied to health and long-term care (European Commission, 2017).

2.11.5. Funded Pensions (Second and third tier)

Voluntary/Mandatory, Occupational/Personal, Book reserves

Occupational pension schemes in Sweden can be described as semi-mandatory, 95% of women and 93% of men are covered through these schemes. They are financed through employers' contributions, fully funded and negotiated by the unions and the employers' confederations in collective agreements. The four occupational pension plans based on sectors are the ones for blue (SAF-LO) and white-collar (ITP) workers in the private sector respectively, as well as the ones for local (KAP-KL / AKAP-KL) and central (PA03) government employees respectively. As they supplement the public pension system, they are of particular relevance for high-income

⁴⁹ The S2 indicator describes long-term fiscal challenges. This entails the permanent fiscal adjustment that is necessary to hold the GDP-to-debt ratio constant over an infinite period over time (European Commission, 2017)

earners, as these plans are not limited by the pension ceiling. Similar to the AP7 Såfa fund, the employee can choose how the money is invested for these occupational schemes. For, e.g., the white-collar pension scheme (ITP), contributions are only covered by the employer, and employees have the choice between traditional insurances or unit-linked insurances by different Swedish providers. The funds from the particular schemes are often administered by companies owned by the respective social partners⁵⁰. It is also possible to opt for a family cover, with several options for different pay-out amounts and durations.

Since a tax reform in 2016, voluntary private pension plans have decreased in relevance, as individuals are not allowed to claim tax-deductions for these plans any longer. As mentioned early, this component is now replaced by the mandatory private pension, which is defined by a 2.5% contribution of pensionable earnings. However, private pension plans are still crucial for the self-employed, in case they did not voluntarily opt for any occupational scheme within their sector. For these individuals without collectively bargained pension plans, tax-deductions are still possible for the contribution payments made to individual pension savings. Nevertheless, the deductions may not exceed 35% of the wage nor be equal to ten times the price base amount⁵¹. The plans are fully funded, and contributors can choose their contribution rate individually.

Investment regulations⁵²

The Swedish Financial Authority that regulates investments of pension providers is called "*Finansinspektionen*". Generally, the prudent person principle of IORP applies as well as the one of Solvency II. For the latter it must be mentioned that if it applies, there are no set limits on investment in the different asset classes. Additionally, there are also no limits to free assets.

Friendly societies⁵³, i.e., benefit societies, are more strictly regulated than other pension providers, as they are not allowed to hold any kind of equity in their portfolio. Investment into retail or private investment funds is also not possible. Loans can only be held in the investment portfolio without a mortgage guarantee or equal security if the debtor is either the Swedish state or a Swedish municipality.

Life insurance undertakings and occupational pension plan providers are regulated in the same manner. There are generally no restrictions across asset classes, except for cases when Solvency II does not apply due to the size of the pension fund/the undertaking. In these cases, the same limits on unquoted, i.e., non-publicly traded, loans and bonds apply. Regarding equity, both can only allocate 10% of their investment to unquoted equity. Life insurance undertakings, for which Solvency II does not apply, are also limited in their investment in quoted equity.

⁵⁰ See for instance Collectum and Fora.

⁵¹ This would be equal to SEK 473 000 in 2020

⁵² OECD, 2021b.

⁵³ A friendly society, sometimes called a benefit society or benevolent society, is a mutual association for the purposes of insurance. The organization is formed voluntarily by individuals to protect members against debts incurred through illness, death, or old age.

Interestingly, there are no specific limits for investment into foreign assets for all aforementioned pension plan providers. All asset categories are regulated the same way as well as this applies to the whole world and not to specific regions or selected countries.

Assets allocated

Unfortunately, it is not possible to determine all indirect investments that are made through Collective Investment Schemes (CIS) in Sweden, meaning that it cannot be defined for all CIS, to which investment categories pension assets are allocated. This fallback category of CIS makes up 66.68% of total investment. Investments into equity and bills & bonds roughly hold the same importance, with 14.6% and 12.7% of total investment respectively at the end of 2022. Only looking at these numbers of identified investments, Sweden is below the OECD average when it comes to investment into these categories, as the mean for pension asset allocation into equity is 30.2% and 41.5% for bills and bonds. Investment in assets abroad as well as in foreign currencies has gradually declined over the past 20 years. According to OECD's Pension Markets in Focus, the share of assets in funded and private pension plans invested abroad was 14.2%. In 2001, the figure was 34.1 %. The share of investments of funded and private pension plans in assets issued in foreign currencies was 8.3% in 2021, compared to 33.1% in 2001.

Investment performance

The real (and nominal) investment rates of return of funded and private pension plans have declined from 2019 to 2020. While the real rate of return for investment in 2019 was 9.4% in 2019 (nominal 11.3%), it dropped to 5.4% (nominally 5.6%) in 2020. Both the real and nominal rates are higher than the medians of the OECD and selected jurisdictions of 6.55% and 9.5% respectively in 2019. In 2020 the same applies with the medians being 5.05 and 4% (OECD, 2021f).

Tax treatment

The taxation regimes vary for the different components of the Swedish pension system. While the old-age earnings-related NDC pension, as well as the guarantee pension are subject to income taxation, but not payroll taxation, the mandatory public FDC pension is taxed under an EET regime, meaning only benefits are taxed. The contributions to the PAYG-system made by employees are fully tax-deductible from other income taxes. In fact, the majority of individuals in Sweden pay no contributions at all, as most of them are able to deduct them from their other taxes. Over the pension ceiling of 8.07 times the income base, which equaled SEK 539.000 or EUR 51.000 in 2020, contributions are not awarded any additional pension rights. Instead, they flow as general taxes into the government budget.

Regarding the second and third tier of the Swedish pension system, both funded occupational plans and private pensions savings are taxed on returns as well as benefits paid out (ETT).

As mentioned earlier, in Sweden, receiving pension benefits and paid labor can be combined. It is worth mentioning in this context, that wage earners in pension age (65 years or older) pay a lower income tax, as well as their employment fees are lower.

2.11.6. Highlights and main features of the system

1. Strengths and weaknesses (according to the Overall Pension Index – OPI)
<ul style="list-style-type: none"> - The Swedish pension systems ranks top with regard to “Sustainability” (OPI score of 0.98 and ranked 2nd among 11 countries compared), with regard to “Adequacy” (OPI score 0.65, ranked 5th), and “Market capitalization” (OPI score 0.76, ranked 2nd) - The Swedish public pension system is unique in that it includes a fully funded component. The rationale behind is a high degree of self-determination and the pursuit of higher returns leading to a less unequal distribution of pension benefits. The Swedish government mitigates financial risks by shifting to individual responsibility and stimulating investment activity among the its pension contributors. This emphasis on fully funded pension plans also result in a considerable accumulation of pension assets for these tiers.
2. Tax treatment
<ul style="list-style-type: none"> - Public system de facto EET, as contributions are tax deductible; Other plans: ETT
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - Public scheme: 7% of gross pensionable income by the employee and 10,21% by the employer of income net of the employee’s contribution. Thus, in total 18,5% of pensionable income, 17,21% of gross income
4. Asset Allocation
<ul style="list-style-type: none"> - Equities (13.8%), Bills & Bonds (9.1%), Cash & Deposits (0.7%), CIS⁵⁴ (73.1%), Other (3.3%)
5. Obligatory character
<ul style="list-style-type: none"> - The premium pension (FDC) is part of the public pension; therefore, all wage-earners are covered by a fully-funded pension system - Public and private sector workers are mandatorily covered by occupational pension plans through collective agreements. Self-employed and employees not covered by collective agreements can either choose to contribute to their respective industry occupational pension plan or to individual pension savings
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - PAYG-component of public pension: lifelong annuity based on life expectancy at retirement - Premium pension: fixed or variable annuity⁵⁵ - Occupational plans: by default, lifelong annuities, possibility to opt for fixed-period annuity. Family cover also optional in the event of death of contributor
7. Contributions to funded plans as percentage of GDP
<ul style="list-style-type: none"> - In 2020, the total general contribution rate to pensions was 12.1% of GDP in Sweden (Vidlund et al., 2022), where 7.5% stem from statutory pensions and 4.5% from occupational pensions
8. Investment performance
<ul style="list-style-type: none"> - The real investment rate of return between 2011 and 2021 was on average 9.63% for the AP7 fund⁵⁶(Pensionsmyndigheten, 2024) - At the same time the OECD average was 3.7%.

Additional information and results

- A unisex life expectancy is used to calculate annuities, to close the gender pension gap as females on average have a higher life expectancy.
- A fully funded private mandatory pension scheme was introduced, which substitutes private voluntary pensions schemes. The latter have been disincentivized by abolishing the possibility of using these contributions for tax deductions.
- Public expenditure on pensions is projected to be stable, the fiscal sustainability gap is small.

⁵⁴ Collective investment schemes (when look-through is not available)

⁵⁵ The pensioner can decide to transfer the capital from the chosen fund to an insurance for guaranteed yearly payments. If the individual chooses to keep the capital in the fund, the capital is adjusted annually.

⁵⁶ The AP7 fund is the default option for the premium pension, when no active investment choice is made.

2.12. Slovakia

2.12.1. Demographic profile and demographic forecast

Slovakia's population is projected to decline in the following years till 2070 (Table 30), according to a forecast by the European Commission (European Commission, 2021). This is due to negligible population growth today (0.1%) and negative population growth in the future, -0.5% in 2070. Even though net migration is positive and increasing over the projection period, it increases only on low levels (by 7,400 in 2070), which leads net migration over population change to be negative at the end of 2070 with -0.3%. This indicator starts off with 0.5% in 2019 and further underlines the negative growth trends in the Slovak population.

Table 30: Slovakia: demographic forecast

	2019	2030	2040	2050	2060	2070	2019 - 2070
Population (thousand)	5,454	5,436	5,305	5,138	4,943	4,712	5,454 → 4,712
Population growth rate	0.1	-0.2	-0.3	-0.3	-0.4	-0.5	0.1 → -0.5
Old-age dependency ratio (pop 65+ / pop 20-64)	25.9	35.9	43.1	56.5	66.3	63.1	25.9 → 63.1
Old-age dependency ratio (pop 75+ / pop 20-74)	8.5	13.8	18.2	22.1	30.2	34.0	8.5 → 34
Ageing of the aged (pop 80+ / pop 65+)	20.4	23.5	31.4	30.4	37.4	46.1	20.4 → 46.1
Men - Life expectancy at birth	74.4	76.5	78.6	80.6	82.4	84.1	74.4 → 84.1
Women - Life expectancy at birth	81.2	82.9	84.6	86.2	87.6	89.0	81.2 → 89
Men - Life expectancy at 65	15.6	17.0	18.4	19.7	21.0	22.1	15.6 → 22.1
Women - Life expectancy at 65	19.6	20.8	22.1	23.4	24.6	25.7	19.6 → 25.7
Men - Survivor rate at 65+	78.2	82.3	85.4	88.0	90.1	91.9	78.2 → 91.9
Women - Survivor rate at 65+	90.2	91.9	93.3	94.4	95.3	96.0	90.2 → 96
Men - Survivor rate at 80+	42.1	50.2	57.1	63.3	68.9	73.7	42.1 → 73.7
Women - Survivor rate at 80+	65.8	71.6	76.1	80.0	83.3	86.1	65.8 → 86.1
Net migration (thousand)	3.4	4.5	5.0	5.4	6.3	7.4	3.4 → 7.4
Net migration over population change	0.5	-0.5	-0.3	-0.3	-0.3	-0.3	0.5 → -0.3

Source: European Commission • Created with Datawrapper

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The old-age dependency ratio is considerably affected by this development. From 2019 to 2070, it increases from 25.9% to 63.1%, which implies, that roughly 1.5 individuals in working age correspond to every pensioner. Similarly, the “ageing of the aged” ratio (population aged 80+ over population aged 65+) more than doubles from 2019 to 2070 from 20.4% to 46.1%. These strong increases in ratios are largely driven by rising indicators of life expectancy. Life expectancy at birth will be 84.1 years for men and 89 years for women in 2070, remaining life expectancy for man and woman aged 65 in 2070 will be 22 and 26 years correspondingly, which for both roughly represents an increase of 6 years. In 2070, 92% of men will survive the age of 65 and 74% the age of 80, where the latter is a 30-percentage point increase. For women, this latter metric only increases by 20 percentage points to 86% in 2070, while the survivor for 65+ increases even less by 6 percentage points to 96% in 2070.

Table 31: Slovakia: Exit ages and expected duration of retirement

	2020	2030	2040	2050	2060	2070	2020 - 2070
Average labour market exit age (CSM) - Men	62.0	62.7	62.7	62.7	62.7	62.7	62.0 → 62.7
Duration of retirement - Men	17.5	18.4	19.9	21.3	22.6	23.9	17.5 → 23.9
Percentage of adult life spent in retirement - Men	28.4	29.2	30.8	32.3	33.6	34.8	28.4 → 34.8
Early/late exit - Men	1.4	1.5	1.4	1.2	1.1	1.2	1.4 → 1.2
Average labour market exit age (CSM) - Women	61.4	61.7	61.7	61.7	61.7	61.7	61.4 → 61.7
Duration of retirement - Women	22.8	23.4	24.8	26.1	27.3	28.4	22.8 → 28.4
Percentage of adult life spent in retirement - Women	34.5	34.9	36.2	37.4	38.5	39.4	34.5 → 39.4
Early/late exit - Women	2.4	3.1	3.4	3.0	2.6	3.1	2.4 → 3.1

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

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Despite this significant rise in life expectancy, the average labor market exit age for both men and women is projected to remain virtually the same, with men exiting the labor market on average with 62.7 years in 2070 and women with one year less. This consistency in labor market exits in combination with the increased life expectancy subsequently leads to longer periods of retirement. Men are projected to spend 23.9 years in retirement in 2070, which equates to 34.8% of their adult life, compared to 17.5 years in 2020, being close to 28% of their adult life. Women will spend 39.4% of their adult life or 28.4 years in retirement in 2070 opposed to 22.8 years or 34.5% in 2020. When it comes to the ratio of early to late exits, it barely changes for men from 1.4 in 2020 to 1.2 in 2070. For women an increase in these ratios from 2.4 in 2020 to 3.1 in 2070 can be seen, meaning that more women will leave the labor market early.

The role of migration

Migration to Slovakia is forecasted to have almost no effect on the age distribution and population growth until 2070. In Figure 56, it can be seen, that the age cohort of 20-64, which starts off with 3.4 million individuals, does not differ significantly in the main scenario and the scenario without migration, only by 100,000, which is equal to 4% of the working population. For the population share that is aged 65+, no difference at all can be detected between the two scenarios, implying that migration of individuals aged 65+ is virtually non-existent, as well as the low migration in the preceding years has little influence on the ageing of the population.

This missing influence of migration on the age composition of the Slovak population leads to the old-age dependency ratios for the two scenarios being very similar (Figure 57). In 2022, the old-age dependency ratio is 28, till 2070, it more than doubles to 66 for the scenario without migration and 64 for the main scenario. This implies that in 2070 1.5 individuals of working age correspond to every pensioner.

Figure 56: Slovakia: demographic forecast with and without migration (2022-2060)

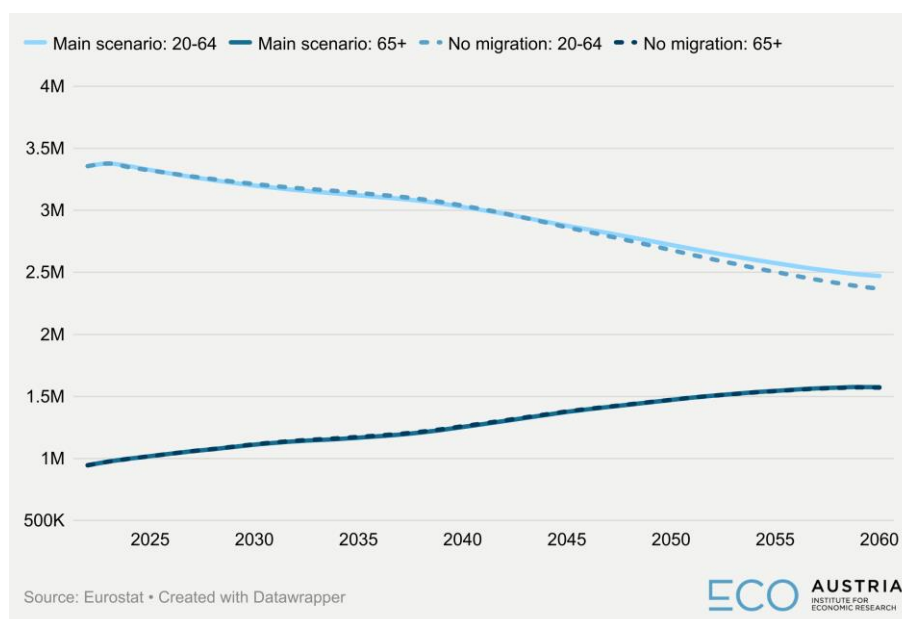
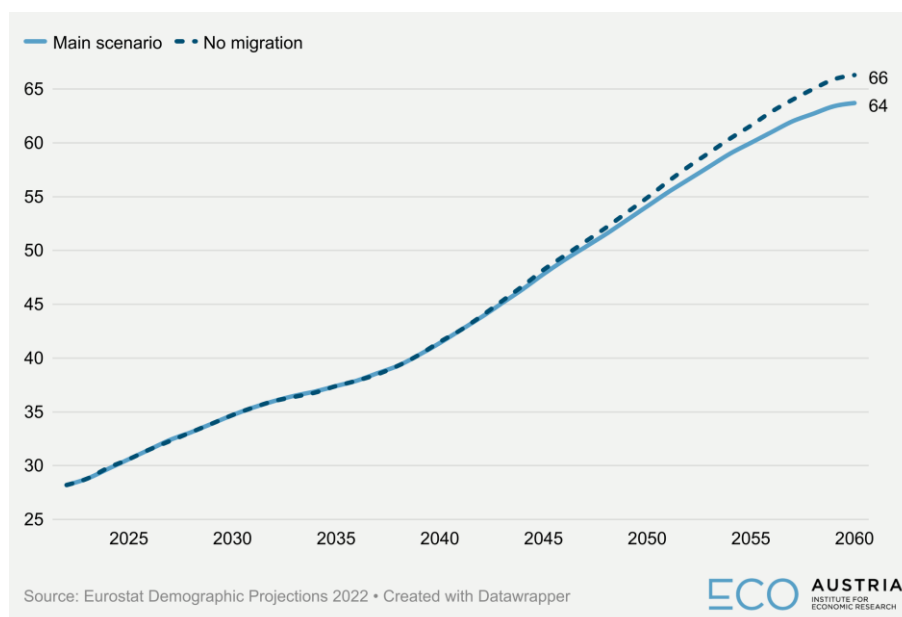


Figure 57: Slovakia: old-age dependency ratio (65+/20-64) in the main scenario and without migration



In order to keep the old-age dependency ratio of 28 in 2022 constant, as a counterfactual exercise, considerable migration compared to the forecast would be required. For 2070, a working age population share of 5.5 million would keep the old-age dependency ratio at 28, considering the forecast for the population share that captures the number of pensioners. Following the forecast, migration or repatriation to Slovakia of 3.2 million individuals would be necessary, which is equal to a yearly average migration rate of 84,505 individuals from 2022 to 2060. This exercise assumes that the migrant population has the same structure in terms of fertility rate and age.

2.12.2. General architecture

The components of the Slovak pension system can be categorized as follows (according to the EU Ageing Report Country Fiche for the Slovak Republic, EU 2020e):

- The statutory old age pension scheme provides a **first-tier** minimum pension (“minimálny dôchodok”) for individuals with insufficient contribution-based public pension benefits who have at least 30 years of minimum insurance periods. Persons with an income (including pensions) below a minimum level can apply for social assistance.
- The **second-tier pensions** are provided by the public mandatory, PAYG defined-benefit system. Benefits are calculated based on earnings-related points. Within the second tier public pensions can be supplemented by voluntary individual accounts. In contrast to the public PAYG scheme, these are fully-funded and defined contribution systems.
- Similarly, to the second tier, the **third tier** is also structured as a private voluntary, fully funded, defined contribution system.

In the following, the focus lays on the universal system, which consisted of 1.64 million pensioners in 2019, including old-age, disability, and survivor pensioners. Considering that the Slovakian population was 5.43 million in 2019, roughly 30 percent of the population were pensioners.

Qualifying conditions

The conditions for the universal old-age pension in Slovakia (Starobný dôchodok) differ for the age cohorts. Generally, the retirement age is tied to the birth year, gender and the number of children raised. In order to be eligible for the first tier, that is the old-age pension of the universal system, individuals have had to be insured for a minimum of 15 year and they must have reached the statutory retirement age. Opposed to that, the second tier, i.e., the fully-funded, voluntary component of the universal system, has no requirements of minimum contribution years, nor a concept of minimum years of insurance or a “full career”.

There is the option for early retirement (Predčasný starobný dôchodok) two years before the statutory retirement age⁵⁷. In order to retire early, individuals have to have contributed at least 15 years and receive pension benefits of at least a 1.6-fold of the subsistence minimum. While receiving the early retirement old-age pension, recipients are not allowed be regularly employed, if the income, which is subject to contributions, exceeds 2400 Euro annually. Early retirement reduces the pension benefits by approximately 6.5% for one year and 12.5% for two years.

When it comes to the calculation of claims, the Slovakian government also takes into account usual periods of receiving social benefits, like maternity leave and sick leave, but also e.g., the time spent rearing children until the age of 6. Linked to different assessments of dangerousness, there are also requirements for the employer to pay into the third tier in addition to the other two tiers.

⁵⁷ If the individual has contributed more than 40 years, they also have the option to retire early.

Current and future retirement age

The statutory retirement age is set to reach 64 by 2030. It applies for different cohorts, and it is meant to increase by two months until it reaches 64 in 2030. This applies to individuals born before 1967. Since 2023, there has been a reform which ties the retirement age to the average life expectancy.

In addition to the birth year, the individual retirement age is also linked to gender and the number of children raised. For mothers⁵⁸, the retirement age is decreased by half a year for every child raised up to 3 children, meaning the maximum reduction is one and a half years.

Even though the general retirement age cap is meant to account for the increased life expectancy, periods of adult life spent in retirement will extend from 28% in 2019 to 35% in 2070 for men and from 34% to 39% for women respectively.

First-tier and second-tier pension by the public pension scheme

The statutory old age pension scheme provides a minimum 1st tier pension (“minimálny dôchodok”) for individuals with insufficient standard pension benefits who have at least 30 years of minimum insurance periods. The minimum pension is needs-based and takes into account the pension income from the standard pension scheme. The purpose of the minimum pension is to provide beneficiaries with a minimum level of pension income, in order for them not to become dependent on social assistance. The minimum amount for the minimum insurance period of 30 years is 33% of the average monthly nominal wage for the calendar year from the two years before the year of pension entitlement.

Persons with an income below a minimum level (including pensions) can apply for assistance in material need (“pomoc v hmotnej núdzi”). Assistance in material need is provided in the form of a financial material need allowance (“dávka v hmotnej núdzi”) that guarantees a certain minimum income level, and in the form of specific allowances (“príspevky ku dávke v hmotnej núdzi”) targeting more concrete needs. The assistance in material need measures are means-tested and do not specifically target older citizens.

The universal 2nd tier pension system differentiates between two cases, the first being the case, where the individual pays exclusively into the public PAYG scheme administered by the Social Insurance Agency, opposed to the second case, where the individuals participate in the mixed systems, i.e., “social security contributions” (SSC) are paid into individual fully-funded pension accounts. Individuals who are insured in the statutory old age pension scheme and who are younger than 35 years of age can “opt into” a FDC scheme and transfer part of their mandatory pension contributions to this scheme. The percentage for the contribution, which is applied on the assessment base, being the gross wage, is 28.75%, regardless of the individual’s choice to contribute to the mixed systems or only into the public PAYG scheme (universal old-age pension). Only the employer’s share differs for the two cases. The employer’s contribution is 21.75%, the remaining 7% are paid by the employee. 17% of the employer’s contribution is direct towards the pension insurance, composed of 14% directed to the old-age insurance and 3% to the disability

⁵⁸ As well as single fathers.

insurance. For the employee, these shares are 4% and 3% respectively. The employer additionally pays 4.75% contribution to the reserve fund of solidarity with his/her total contribution of 21.75%⁵⁹.

The calculation of pension benefits from the standard public old-age pension system is earnings-related and based on a point system. The amount of the pension benefit is then also based on the number of contributing years, the average pension point and the current pension point value.

The average pension point value is a ratio that describes the average lifetime wage-earnings position of the individual against the average wage⁶⁰, it is capped to the value of 3. In addition. The average pension point is also subject to a “solidarity formula”, which, in short, increases pensions below a point value of 1 and decreases pensions of point value larger than 1.25.

Regarding the current point value, since the 2004 reform, the exemplary calculation as a residual is as follows: A person, who has earned the average wage (i.e., an average pension point value of 1) throughout 40 years of career receives benefits roughly equating a replacement rate of 50%. The current point value is indexed to the average wage for the stability of the replacement rate. Since 2017, the indexation of pensions themselves is generally done through the pensioners’ inflation. The pensioners’ inflation is the CPI measured with a consumption basket of pensioners.

Funded second-tier pensions

As mentioned, the universal pension system provides for the possibility of partially opting into a FDC occupational pension system. When it comes to the voluntary second tier FDC component of the universal system, only the contribution components of the employer change. If the contributor decides to pay into the funded system, the contribution to the old-age insurance by the employer is split: After 2024, 6% are directed towards the second tier FDC system, while the remaining 8% will still be paid into the old-age insurance. If this mixed approach is chosen, the pension benefit stemming from the PAYG system has to be reduced. The base of assessment for the reduction is the sum of old-age insurance components, both by the employer and employee, as well as the solidarity fund contribution. The contribution towards the FDC component is then divided by the assessment base in order to determine the percentage, that has to be deducted from the pension benefit⁶¹. Normally, the option chosen for the FDC component is a lifetime annuity with a private insurance company.

2.12.3. PAYG and fiscal challenges

Public Expenditure

Slovakia starts of at an average or favourable position, when it comes to the expenditure on pensions as of GDP, of around 8.3%, which is below the OECD average. Nonetheless,

⁵⁹ To reiterate, 14% are paid to the old-age insurance, 3% to the disability insurance and 4.75% to the solidarity fund by the employer, equaling a total contribution of 21.75%.

⁶⁰ A value of 1 therefore describes an individual, that has constantly earned the average wage in the Slovakian economy.

⁶¹ 18% are contributed by the employer to the old-age insurance, while it is 4% by the wage-earner. Adding the solidarity contribution, the assessment base is equal to 22,75%. After 2024, 6% can be direct the FDC component. The reduction of the benefit transferred to the standard PAYG scheme is therefore $6\%/22,75\% = 26,4\%$

expenditure on pensions is projected to increase strongly and gradually to 14.5% during the projection period until 2060 (Figure 58). The Ministry of Finance of the Slovak Republic (EU 2020e) refers to several driving forces regarding the increase in expenditure. In the short term, the decrease in GDP due to the COVID-19 pandemic is seen as negative, temporary influence. But also, the introduction of the thirteenth pension is seen as a liability, as the measure⁶² is set to add 0.2% to the expenditure as share of GDP. Furthermore, it is added, that the retirement age cap of 64 and the retirement of strong cohorts in from 2030 to 2035 is one of the drivers of the increase in expenses. As the retirement age is capped at 64 from 2030, pensioners will spend more time in retirement, hence the public expenditure on pensions increases. The universal old-age pension with its earnings-related component as well as early pensions will make up the bulk of expenditure, rising from 6.5% in 2019 to 10.9% in 2060.

In 2018, poverty indicators for the Slovak Republic were below the OECD averages, nonetheless, some patterns are visible (according to OECD 2021 Pensions at a Glance). The share of individuals aged over 75 that live in poverty (6%) is higher than the share of the cohort aged 66-75 (4.5%), meaning old age poverty increases with age. However, these indicators are 15.3% and 11.4% respectively for the OECD average. A bigger gap can be observed between elder men and women: 2.6% of men aged above 65 experience poverty, while it is 6.5% for women. The gap in percentage points is nonetheless lower than the OECD average, as 10.1% of elder men were living in poverty opposed to 15.1% of elder women. Lastly, all of the indicators on old-age poverty mentioned before show the poverty in age is less prevalent with 6.5%, as the share of people living in poverty for the total population in the Slovak Republic is 7.7%.

The gross pension replacement rate of Slovakia is virtually at both the OECD and European Union average in 2020 with 53.1%⁶³. Yet, the net replacement rate is significantly higher with 69% compared to the OECD average of 62% and the European Union average of 64%. This may be explained by the low (or lack of) taxation of pensions in Slovakia (see beneath in the section on tax treatment). Gross and net pension wealth are also virtually equal to the OECD and European Union averages with 9.1% and 11.9% of GDP in 2020⁶⁴. When it comes to pension funds' assets, Slovakia exhibited tremendous growth in last two decades. While pension funds' asset made up less than 0.1% of GDP between 2000-2004, following these years, this indicator has risen to 15.9% of GDP in 2021. Even though this share is much lower compared to other OECD countries, it has to be taken into account that Slovakia's second tier FDC pension scheme is still fairly young (adopted in 2005). Private pension assets also have grown in absolute terms during this period and are now valued at 17,460 million USD.

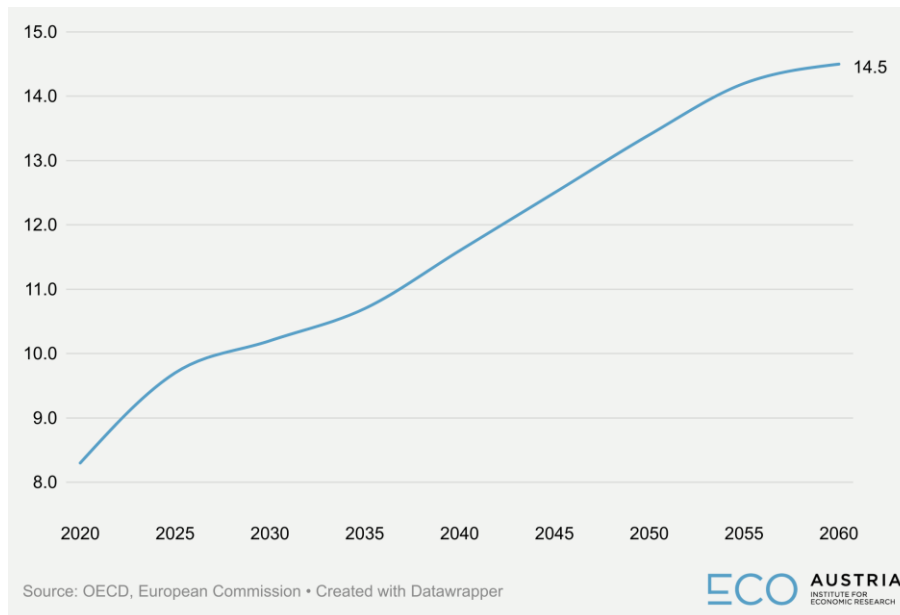
⁶² The Thirteenth or Christmas bonus was legislated in 2020. All pensioners are eligible for it, to the amount paid out ranging from 50 to 300 Euro depends on the value of the regular pension.

⁶³ The OECD average is 51,8%, the average in the European Union is 52%.

⁶⁴ The OECD average for gross pension wealth was 9,4% of GDP, for net pension wealth it was 11,3%. For the European Union, these indicators were 9,2% and 11,3% respectively.

Forecast of public expenditure

Figure 58: Slovakia: Forecast of public expenditure on pensions (in % of GDP)



Decomposing the effects on GDP into the four determinants, being the dependency ratio, coverage ratio, benefit ratio and the labour market effect, it is clear, that the dependency ratio has the biggest impact on expenditure as a percentage of GDP (Figure 59). In the dependency ratio, the ageing of the population is reflected which is both determined by longer lives and lower fertility rates in Slovakia. Precisely, the ratio of the population of elders (65+) to the working age population (20-64) is set to increase from 28 in 2022 to 63 in 2070. Across the projection timeframe, the dependency ratio contributes to the increase of the pension expenditure by 10.4 percentage points of GDP, with the largest increases occurring in 2023 and 2050 due to the retirement of larger cohorts.

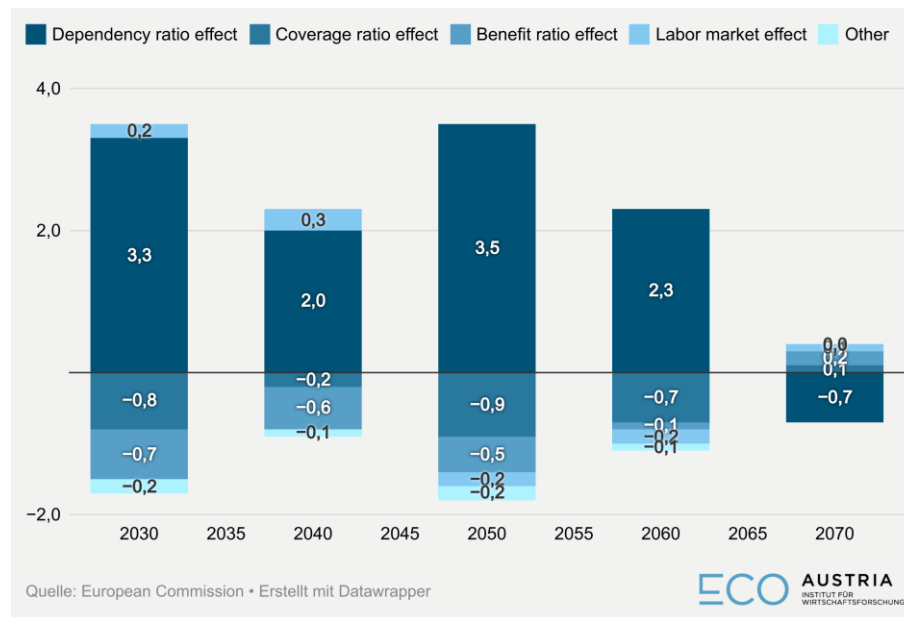
The effect of the dependency ratio is mitigated by the coverage ratio, which is driven by the increase in retirement age, hence less people will be covered by the universal public pension until they reach the age of the 64. This effect is projected to become weaker after 2023, as the retirement age cap of 64 will be reached by then. Nonetheless, in 2050 and 2060, the effect becomes more relevant again through the cohort effect⁶⁵.

When it comes to the benefit ratio, it can also be observed, that this effect decreases expenditure in the projection period, which is due to the decrease in the benefit ratio itself. As it was recently legislated that the pensions will no longer be indexed to the general inflation but to the pensioners inflation. As a result, the value of pensions opposed to the average in the Slovakian economy decreases, as wages are normally indexed to the general increase in prices. At the same time,

⁶⁵ The cohort effect describes the ratio of individuals aged 50-64 to individuals aged 65+. It is multiplied with the coverage ratio of early age pensioners, i.e., under the age of 65. As mentioned above, large cohorts will retire from 2035 on, leading to redistribution from the population aged 50-64 to the population aged 65+. This leads to a decrease in the cohort effect, which in result decrease the early age coverage age, which is added to the to the old-age coverage ratio (includes pensioners aged 65+) to calculate the total coverage ratio.

the decrease in the benefit ratio is also influenced by the shift from the public PAYG scheme to second tier FDC pensions. The benefit ratio displayed here accounts for old-age earnings-related benefits, which does not include the benefits received from the second-tier FDC scheme. Therefore, this transition of pensioners receiving income from both schemes explains partly the decline in the old-age earnings-related benefit ratio.

Figure 59: Slovakia: Components of change in the public expenditure



Forecast of replacement rates

As mentioned above, the benefit ratio from the PAYG pillar is set to decline, hence the replacement rate also declines. However, it is also claimed that the public scheme replacement rate will increase until 2030, when the retirement age cap is reached, due to the extension of careers, for individuals only participating in the public PAYG scheme. For individuals, who contributed to both schemes, the replacement rate of the old-age earnings-related pension is going to decline, as some of the pension contributions are diverted to the second tier FDC scheme. However, the total replacement rate, which accounts for all pension components is going to remain virtually the same throughout the projection timeframe, as payouts from the sFDC system are going to supplement benefits from the PAYG scheme. Marginally, a slight dip in the replacement rate can be seen, the Ministry of Finance of the Slovak Republic (EU 2020f) claims, that older cohorts tend to invest their pensions funds in second tier FDC scheme more risk-aversely compared to younger cohorts, which will lead to higher returns on the funds of these latter cohorts.

Table 32: Slovakia: Benefit ratios and replacement rates until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Public scheme (BR)	37%	35%	33%	32%	32%	32%	-5.0
Public scheme old-age earnings related (BR)	37%	33%	31%	29%	29%	30%	-8.0
Private occupational scheme (BR)							
Private individual scheme (BR)							
Total benefit ratio	37%	35%	33%	32%	32%	32%	-5.0
Total replacement rate	42%	41%	39%	39%	41%	42%	1.0

Source: European Commission • Created with Datawrapper

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Forecast of debt levels

During the early 2000s, the Slovak Republic was able to reduce its public debt significantly from 58% of GDP in 2000 to 47% in 2010. This development can mainly be explained through sustained economic growth during that period, also strongly driven by FDI in the automotive industry, which is also called the “Tatra Tiger” period or the “Slovak Economic Miracle” (Grančay & Grančay, 2017). Additionally, the adoption of the Euro in 2009 and the linked anticipation effects contributed to Slovakia’s economic performance and its’ ability to remove public debt (Žúdel & Melioris, 2016)⁶⁶.

On the contrary, Slovakia was also impacted by the 2008 financial crisis, though to not as big of an extent as its neighbours. Yet, the following Eurozone crisis also led to Slovakia’s borrowing cost to rise leading to fiscal pressure and in result higher levels of debt.

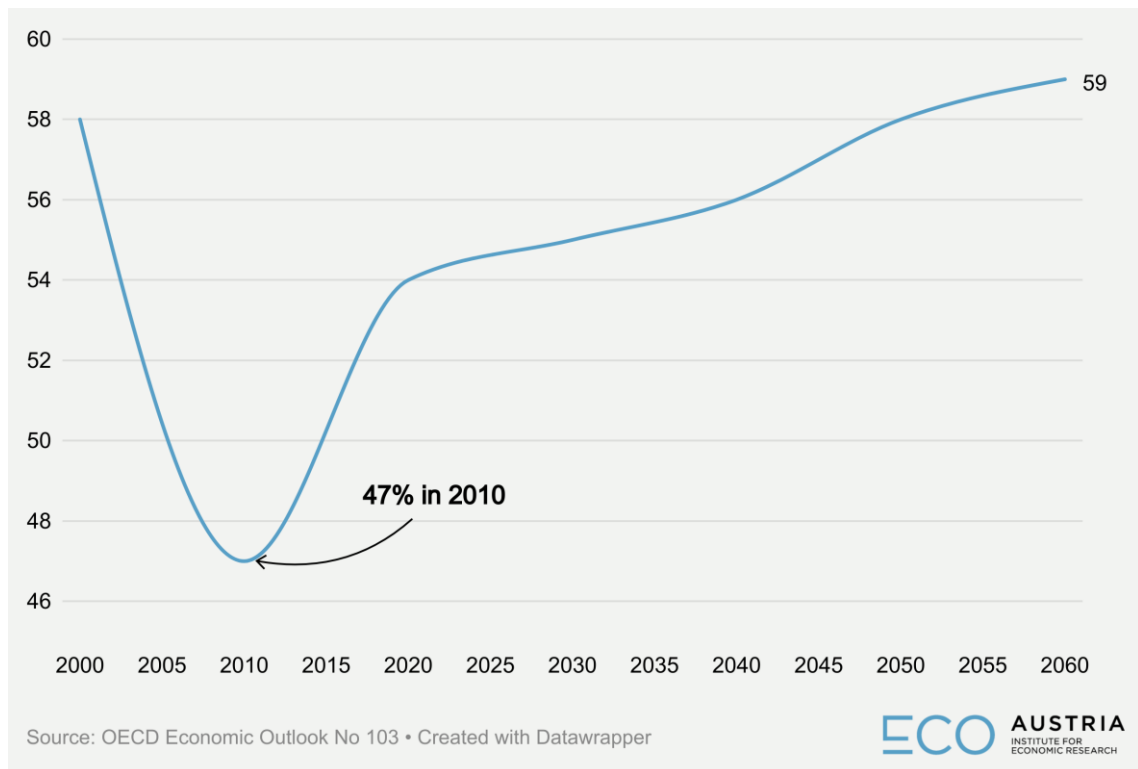
When it comes to the long-term analysis of the debt sustainability and fiscal path of Slovakia, the European Commission “Debt Sustainability Monitor” from 2022 shows a high risk on different dimensions for Slovakia. Even though the projections of Slovakia’s S2 indicator showed medium risk in 2019, now Slovakia has both the highest S1 (medium-term) and S2 (long-term) indicator in the Eurozone. For Slovakia the overall adjustment to stabilize public debt long-term and to mitigate the fiscal risk associated with it, an adjustment of more than 10 percentage points of GDP is necessary. Solely the cost of ageing in Slovakia makes up 6 percentage points of the long-term sustainability gap⁶⁷. Adding onto that, Slovakia’s initial fiscal position was also the least favourable in the 2022 analysis. In Figure 60, the strong surge in public debt can be observed after 2010. Following the projections by the European Commission, the expected rise in debt might stem from Slovakia’s fiscal sustainability gap and the resulting pressure on the government budget and the debt service. The Ministry of Finance of the Slovak Republic forecasts that the public pension contributions will remain constant until 2060 and around roughly 7% of GDP, while the public

⁶⁶ Through the adoption of the Euro, Slovakia was able to stabilize its financial market and reduced currency-related transaction costs and exchange risks. Furthermore, Slovakia has benefited from reduced borrowing costs in the Eurozone through the access to euro area financial markets and lower interest rates on government bonds.

⁶⁷ In Slovakia, it is legislated, that state budget covers deficits in the pension scheme, if contributions, the reserve fund of solidarity as well as other surpluses from social security funds cannot cover the public pension expenditure. Considering the sharp increase in life expectancy and the linked increase in years spent in retirement, the following cost of ageing puts strong pressure on the government budget.

expenditure on pensions will double that with 14%. Consequently, the public pension system deficit is set to reach 7.5% in 2060.

Figure 60: Slovakia: Public debt in % of GDP



2.12.4. Funded Pensions (Second and third tier)

Voluntary/Mandatory, Occupational/Personal, Book reserves

The Slovak Republic introduced a third-tier pension scheme in 1996, to supplement the first two tiers. This scheme is privately managed, as well as voluntary, fully funded and based on defined contributions. It must be added that the third-tier pension scheme is not voluntary for all wage-earners: Individuals working in professions deemed dangerous are required to contribute to the third tier, though the percentage is paid by the employer.

Payments to this supplementary pension scheme are tax-deductible up to a maximum of 180 Euro a year. The option to use pension contributions of the third tier as tax-deductibles was reinstated in 2004 and is available to new third tier participants, as well as participants accepting stricter requirements regarding the payout phase. At the end of 2019, roughly 800'000 individuals participated in the third-tier scheme, which at that time comprised assets worth 2,288 million euros.

Investment regulations

The financial regulative authority in the Slovak Republic is held by the National Bank of Slovakia (Národná banka Slovenska) There is high variability in strictness when it comes to investment

regulation in the Slovak Republic and the rules set in place show how the financial regulator directs investment of pension funds to some extent. Broadly speaking, investment in bonds and bills issued by both the public administration and the private sector are the least regulated, as direct investment into them is always possible (except for mortgage bonds and index pension funds). This applies to privately managed pension systems as well as voluntary personal pension plans. Regarding equity, the regulation is stricter, limits of 80% apply to mandatory pension funds, pay-out voluntary pension funds are not allowed at all to invest in equities. Additionally, all these funds, both voluntary and mandatory are very limited in their allowance to invest in retail investment funds, between 10%-20% of investment is allowed. Investment into private investment funds is completely prohibited. Allocation of into financial derivatives is only permitted to a limit of 15%, if these are acquired for the purpose of hedging against or mitigating the market risk, in order to stabilize the value of the pension fund asset linked.

Investment of pension funds into foreign markets is also regulated, especially when it comes to bonds and bills. Only 20% of investment can be allocated to different money market instruments issued or guaranteed by other EU Member states and other relevant institutions⁶⁸, voluntary personal funds have a limit of 35% in that context. For other asset classes e.g., equities, there are no limits for OECD and EU regulated markets. This also applies to retail investment funds, yet investment into private investment fund is not permitted. Additionally, there is a limit to of 30-50% on foreign currency exposure, if issued or guaranteed by a member state.

To summarize, investment regulation of pension funds in Slovakia is rather tight, several quantitative rules are set in place to direct investment and to limit risk, revealing a more conservative approach to investment (OECD 2021b).

Assets allocated

39.1% of investments were allocated to collective investment schemes, indicating that a detailed look-through analysis was not available in the OECD report on pensions (OECD, 2021b). Only the categorization into equities and bills & bonds was available, making up 55.8% of Slovakia's pension assets. It must be added here, that bills and bonds represented the majority of assets, equities had a share of less than 5% in 2021.

In the last years, Slovakia has shifted towards in investing its' pension assets abroad. Considering last decade, pension plan assets invested abroad have almost doubled to 85% of GDP. Thus, Slovakia is one of the 5 OECD countries, that invested the most in assets in foreign markets. Nevertheless, these markets were either in the Eurozone or used the Euro as the main currency, as Slovakia only invested 9% of pension fund assets in foreign currencies.

Investment performance

The real and nominal investments rates of return of funded and private pension plans have diverged quite a lot over the last years in the Slovak Republic. While the gap was only around 3 percentage points in 2019, the nominal rate was 6.4% and the real rate was 3.3%, the gap has

⁶⁸ This includes the European Central Bank, the World Bank, the European Bank for Reconstruction and Development and the International Monetary Fund.

nearly doubled for 2021. While the nominal rate reached 6,4% again after dipping to 2.7% in 2020, the real investment rate of return was 0.4%, indicating that Slovakia experienced higher inflation in 2021, which could not be offset by the gains in the rate of return. In comparison to the other OECD countries, Slovakia can be located in the lower third of the cohort, being well under the weighted and simple average of 3.7% and 3.0% respectively. Notwithstanding, there were no negative real rate of returns in the period from 2019, which has been the case for 10 OECD countries. Compared to other jurisdictions in the OECD “Pension Markets in Focus” report (OECD, 2022), Slovakia is above the averages of this cohort, outperforming both the weighted and simple averages of 0.0% and -0.9%. The average annual investment rate of return of funded and private pension plans in Slovakia has been quite stable over the last two decades, with both the 20-year and 10-year geometric average, going back from 2021, being close to zero and therefore being equal to real rate of return in 2021.

Tax treatment

Generally, the public pension is entirely tax-exempt, meaning that the taxation follows the EEE tax treatment. Neither pension contributions nor benefits to the universal public scheme, which refers to both of the second-tier options, are taxed. The EEE rule also implies, that returns within the second tier are not taxed. Additional voluntary contributions to the individual retirement accounts are not capped and are also tax-deductible up to a limit of 2% of the salary⁶⁹. On the employer’s side, contributions to pensions funds are counted as employee’s income and are therefore tax deductible for the corporate tax, if it does not exceed 6% of the employee’s salary.

However, the Slovak government levies a tax on the contribution and returns of supplementary, private voluntary third-tier pensions. Opposed to the tax-exemption of the individual retirement accounts, withdrawals from the supplementary pension funds are flat-taxed at a 19% rate. Both returns generated during accumulation as well as with the pay-out phase are taken into account, yet the value that stems from the original contribution is tax exempted for the withdrawal⁷⁰. The possibility for tax-deduction is only given up to 180 euro and tied to conditions explained in the subchapter “Voluntary/Mandatory, Occupational/Personal, Book reserves”.

⁶⁹ Additionally, the voluntary contributions are not allowed to exceed 2% of 60 times the monthly average salary in Slovakia in order to be tax-deductible.

⁷⁰ That means TTE applies, the original contribution was taxed, the returns are taxed, but not the paid-out benefits.

2.12.5. Highlights and main features of the system

1. Strengths and weaknesses (according to OPI)
<ul style="list-style-type: none"> - Medium adequacy (OPI 0.61), but low financial sustainability (OPI 0.48) and very low market capitalization (OPI 0.04) - Slovakia's main challenges relate to the financial sustainability of its pension system and the cost of ageing. Although the fully-funded components of its public system are still relatively young, there is an urgent need to further incentivise these funded components to diversify retirement income streams in order to reduce fiscal pressure.
2. Tax treatment
<ul style="list-style-type: none"> - The Slovak pension system mainly follows EEE taxation. However, for the second tier FDC plans, voluntary contributions by the employee are not tax-deductible - Third tier plans follow a TTE tax schemes, where the contributions can only be partly tax-exempt and the returns on investment are taxed with a 19% flat tax
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - The total contribution rate is 28,75% of gross wage - In both cases, whether the individual opts for mixed system or not, 21,75% is covered by the employer and the remaining 7% by the employee.
4. Asset Allocation
<ul style="list-style-type: none"> - Equities (4.0%), Bills and Bonds (51.8%), Cash and Deposits (2.7%), Collective Investment Schemes (39.1%) and Other (2.4%)
5. Obligatory character
<ul style="list-style-type: none"> - The fully-funded component of the public system can be chosen voluntarily - Third-tier pensions are only compulsory if the person is in a profession considered dangerous
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - For the second tier FDC pensions, the default option is a lifelong annuity, if income is high enough, a fixed-period annuity or a programmed withdrawal is also possible
7. Contribution rate to funded plans
<ul style="list-style-type: none"> - Contributions to funded systems by employees were equal to 0.2% of GDP in 2021 (or latest year available), while the contribution by employers to these systems was 1.2% of GDP
8. Investment performance
<ul style="list-style-type: none"> - The real average annual investment rate of return over the last ten years (2021-2011) was 1.2% - At the same time the OECD average was 3.7%.

Additional information and results

- Slovakia exhibits the largest fiscal sustainability gap in the analysed group of countries. It is largely driven by the cost of ageing and gradually increase expenditure on public pensions as a percentage of GDP to 14.7% in 2060.
- Slovakia has introduced a second-tier FDC pension system in 2005, which is comprised of fully funded individual retirement accounts. This scheme is part of the universal system, individuals can choose to contribute to this mixed system instead of only into the public PAYG system. The percentage diverted to the second tier is paid by the employer, yet, this pension plan is not an occupational one.
- Except for the third tier, pensions follow the EEE taxation scheme, meaning that no contribution nor returns nor benefits are taxed.

2.13. United Kingdom⁷¹

2.13.1. Demographic profile and demographic forecast

According to the demographic forecast for the United Kingdom (Table 33) the population will grow strongly through the whole projection period and will reach over 80 million inhabitants until 2070. The composition of the population will change similarly to other European nations. From the current old-age dependency ratio (65+ population as a fraction of population 15 to 64) of 27.9%, it will increase by almost twenty percentage points to 46 in 2070. Slightly newer projection from the 2019 World Population Prospects indicates an increase of the dependency ratio (defined in this case with the 20-64 population in the numerator) to 55.1 by 2080. Moreover, “ageing of the aged” indicator, i.e., the relationship between over 80-year-olds to persons aged 65+ will increase from the current 26.9% to more than 40% in the longer run, reflecting highly increasing life expectancy. All indicators of life expectancy, both at birth and at the age of 65 for both males and females are expected to increase sharply, reaching over 90.1 years – on average – for females in 2070. Furthermore, about 95% are expected to survive to the age of 65, for both males and females, and more than 80% are expected to survive to the age of 80 in 2070, with females reaching almost 90% survival rate 80+.

Table 33: United Kingdom: demographic forecast

	2016	2030	2040	2050	2060	2070	2016 - 2070
Population (thousand)	65,607	71,758	75,152	77,67	79,419	81,041	65,607 → 81,041
Population growth rate	0.7	0.6	0.4	0.3	0.2	0.2	0.7 → 0.2
Old-age dependency ratio (pop 65+ / pop 15-64)	27.9	34.4	38.5	40.2	43.5	46.0	27.9 → 46
Ageing of the aged (pop 80+ / pop 65+)	26.9	31.1	33.1	39.2	37.9	40.3	26.9 → 40.3
Men - Life expectancy at birth	79.6	81.6	83.0	84.2	85.4	86.5	79.6 → 86.5
Women - Life expectancy at birth	83.3	85.3	86.7	87.9	89.0	90.1	83.3 → 90.1
Men - Life expectancy at 65	18.8	20.1	21.1	22.0	22.8	23.6	18.8 → 23.6
Women - Life expectancy at 65	21.3	22.8	23.8	24.8	25.7	26.5	21.3 → 26.5
Men - Survivor rate at 65+	87.5	89.9	91.3	92.5	93.5	94.4	87.5 → 94.4
Women - Survivor rate at 65+	91.7	93.4	94.4	95.2	95.9	96.5	91.7 → 96.5
Men - Survivor rate at 80+	60.2	66.7	70.8	74.5	77.7	80.6	60.2 → 80.6
Women - Survivor rate at 80+	71.4	77.1	80.5	83.4	85.9	88.1	71.4 → 88.1
Net migration (thousand)	244.0	220.1	181.0	134.2	121.1	107.3	244 → 107.3

Source: European Commission • Created with Datawrapper



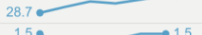

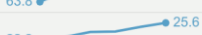


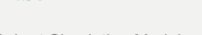
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Finally, net migration is expected to decline from current levels, putting additional pressure on the old-age dependency ratio, but will remain high throughout the projection period. One aspect of

⁷¹ Information comparable to the other cases for the United Kingdom is taken from the Ageing Report 2018 (not 2021). While 2018 reports are based on 2016 data, the 2021 report are based on the 2019 data. However, both sets have been established before the onset of the Corona pandemics, which should result in only minimal changes to the long-term projections of the demographic situation. Whenever possible, the data has been updated with newer sources.

the 2016 forecast is the fact that it was predicted that net migration would fall sharply following Brexit, which had not yet been forecast in 2016. However, more recent assessments show that while immigration from the "new" EU countries has indeed fallen, it has been more than fully replaced by immigration from outside the EU.⁷² This suggests that Brexit effect should not result in a much worse demographic projection than presented in this work.

Table 34: United Kingdom: exit ages and expected duration of retirement

	2017	2030	2040	2050	2060	2070	2017 - 2070
Average labor market exit age (CSM) – Men	65.0	65.1	65.1	65.8	65.8	65.8	
Duration of retirement – Men	19	20.1	21.1	21.1	21.9	22.7	
Percentage of adult life spent in retirement – Men	29	29.9	31.0	30.6	31.4	32.2	
Early/late exit – Men	2	1.2	1.3	1.4	1.5	1.5	
Average labour market exit age (CSM) - Women	64	65.1	65.1	65.8	65.8	65.8	
Duration of retirement - Women	22	22.8	23.8	23.9	24.8	25.6	
Percentage of adult life spent in retirement – Women	33	32.6	33.6	33.4	34.2	34.9	
Early/late exit - Women	1	1.5	1.5	1.4	1.5	1.5	

The labour market exit age as calculated based on Labour Force Survey data for the base year and estimated by the Cohort Simulation Model thereafter; 'Duration of retirement' is calculated as the difference between the life expectancy at the average labour market exit age and that exit age itself; The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 18 years; Early/late exit is the ratio between those who retire and are below the statutory retirement age and those who retire at the statutory retirement age or above.

Source: European Commission • Created with Datawrapper

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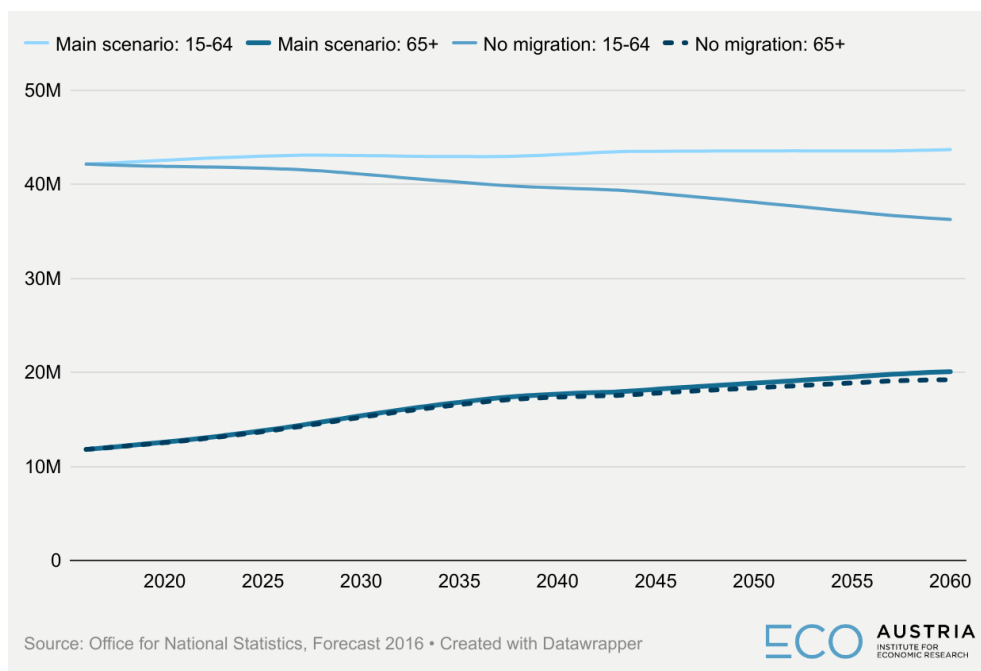
According to Table 34, the effective exit age from the labor market increases over the projection period, particularly for women, who are expected to experience an increase of 1.8 years by 2070. However, this does not keep pace with increases in longevity, so the proportion of adult life spent in retirement also increases over the projection period for both sexes. For men, the proportion of life spent in retirement rises to 32.2%, and for women to 34.9%. However, the increase is not as large as in some other countries where the effective exit age is comparatively lower. Early retirement is comparatively high, with rates between 1.5 and 2% for both sexes.

⁷² Compare e.g., <https://cepr.org/voxeu/columns/impact-brexit-uk-economy-reviewing-evidence>

The role of migration

The scenarios presented above are based on the main demographic forecast, which assumes positive net migration in the long term. While, as noted above, Brexit has not yet led to lower migration, as migration from outside the EU has replaced migration from the EU, it is still quite unclear what the long-term effects will be. Moreover, the forecast relies heavily on a constant stream of high positive net migration. To keep the calculation comparable with the 2016 Ageing Report, we use the 2016-based projection here. Meanwhile, it is possible to compare the projections with more recent data from 2018 and 2020.⁷³

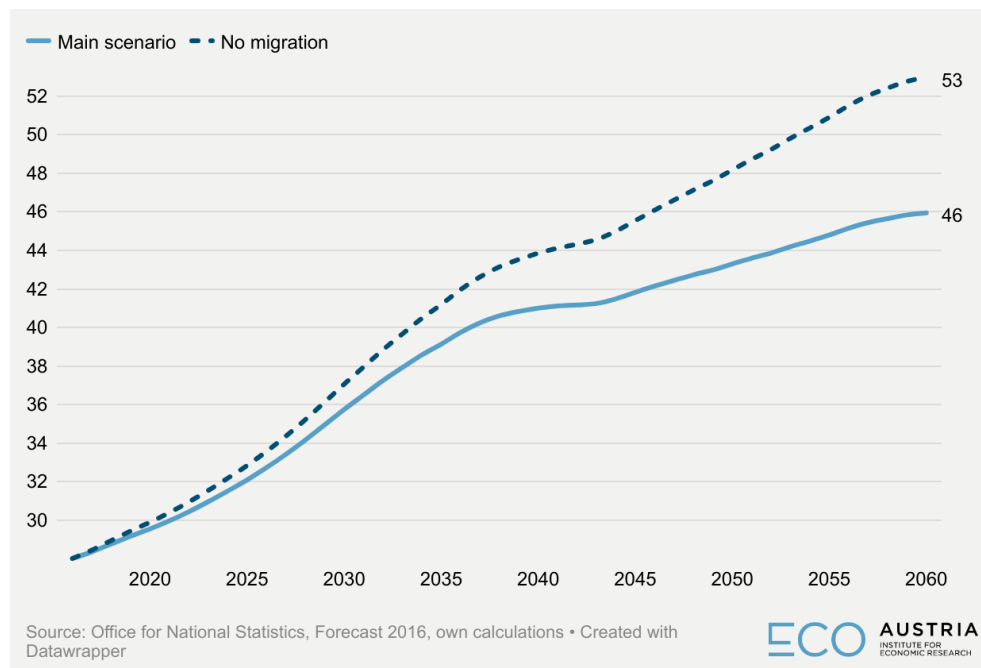
Figure 61: United Kingdom: demographic forecast with and without migration (2016-2060)



The working-age population in the scenario without migration is about 7 million lower in 2060 (Figure 61) while the population of persons 65+ will steadily grow. The difference amounts to about 170 thousand net migration per year on average until 2060. The no-migration scenario results in a significantly higher old-age dependency ratio in 2060 in the no-migration scenario (Figure 62). A counterfactual exercise can also be performed: how high would migration have to be to keep the dependency ratio in 2060 at the level of 2016 (assuming equal fertility rates between the domestic and foreign populations). To keep the dependency ratio stable, the working-age population would have to be about 32 million higher in 2060. This means that net migration would have to average about 730 thousand people per year until 2060. A more recent projection, published in 2020, shows a slightly lower working-age population in 2060 at 42.2 million (compared with 43.7 million in the 2016 forecast) and, consequently, a slightly worse dependency ratio in 2060 at 45.94 (compared with 45.02 in the 2016 forecast).

⁷³ See: <https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections>

Figure 62: United Kingdom: old-age dependency ratio (65+/15-64) in the main scenario and without migration



2.13.2. General architecture of the pension system

Qualifying conditions

The United Kingdom introduced a new State Pension system on April 6, 2016, for individuals reaching State Pension age on or after that date. Under the pre-2016 system, a person reaching State Pension age qualified for a full basic State Pension by: i) paying, or ii) being treated as having paid, or iii) being credited with National Insurance contributions for 30 qualifying years in their working life (between 2010 and 2016. Prior to 2010, it was 44 years for men and 39 years for women). For people with less than 30 qualifying years, a proportionally reduced basic state pension was paid, down to a minimum of one qualifying year of contributions or credits (for those reaching state pension age between 2010 and 2016). People with no existing National Insurance record before April 6, 2016, who reach State Pension age on or after April 6, 2016, will need 35 years of contributions to receive a full new State Pension amount, and the minimum qualifying period will be 10 years. For people with an existing record on April 6, 2016, transitional arrangements will in most cases take into account an individual's National Insurance record prior to April 6, 2016, plus further qualifying years from then (OECD, 2021).

Current and future retirement age

The state pension age is currently 66 for both men and women but will gradually increase from May 6, 2026. For those born before April 6, 1970, the retirement age will be 67. For those born between April 6, 1970, and April 5, 1978, the retirement age varies between 67 and one month and 68, depending on the date of birth. For men and women born after April 6, 1978, the retirement age is 68. There is generally no possibility of early retirement.

First-tier pensions

Basic pensions: A basic state pension for a single person for the 2023/24 tax year is £156.20 per week, and double that for married couples. A married woman who doesn't have the full number of qualifying years and whose spouse retired before April 2016 may be entitled to claim the married woman's rate, which is 60% of the spouse's basic state pension.

The standard new state pension for a single person in 2023 will be £203.85 per week, and double that for married couples. For those with between 10 and 35 qualifying years, a proportion of the New State Pension will be paid instead (these years don't have to be consecutive).

In 2020, the average basic pension will be equal to 16.7% of average earnings. This is second only to Ireland (27.7%) among countries with contributory basic pensions. It covered 105% of those aged 65 and over.

Targeted support: Pension Credit is a tax-free weekly benefit paid to pensioners on low incomes to top up their income to a certain level. Pension Credit is an income-related benefit and is not based on National Insurance contributions. There are two elements to Pension Credit, the guarantee credit and the savings credit. The Guarantee Credit ensures a minimum level of income by providing financial support to people who have reached the qualifying age (which is the same as the qualifying age for the State Pension) and whose income is below the "adequate minimum guarantee", which in 2023 will be £201.05 per week for single people and £306.85 for couples. For those whose weekly income exceeds these thresholds, they can still qualify for Guarantee Credit if they meet one of the following criteria: have a severe disability, are a carer, or have housing costs such as a mortgage. The rates in these cases are £76.4 per week for disabled people and £42.75 per week for carers in 2023.

If an individual reached State Pension age before April 6, 2016, or if one of a couple reached State Pension age before April 6, 2016, they may be eligible for Savings Credit. There is no fixed savings threshold for Pension Credit. However, having savings in excess of £10,000 will have an impact on the amount of benefit received. Savings Credit is paid at the rate of GBP 0.6 for every GBP 1 of income above the Savings Credit Threshold (which in 2023/23 will be GBP 174.49 per week for singles and GBP 277.12 per week for couples) up to the Savings Credit Maximum (which in 2023/24 will be GBP 15.94 per week for singles and GBP 17.84 per week for couples). If an individual has an income above their "adequate minimum guarantee", i.e. they are not entitled to the guarantee credit, then every GBP 1 above their "adequate minimum guarantee" will result in a reduction in the savings credit of GBP 0.4, up to the point where they are no longer entitled to the savings credit.

Targeted support equaled in 2020 21.6% of average earnings, which is slightly above the OECD average of 20%, and covered 16% of eligible population.

Second-tier PAYG pensions

United Kingdom does not have a second-tier public PAYG system. It only has a quasi-mandatory private FDC system, which is described in more detail in Section 2.13.4.

2.13.3. PAYG and fiscal challenges

Public Expenditure

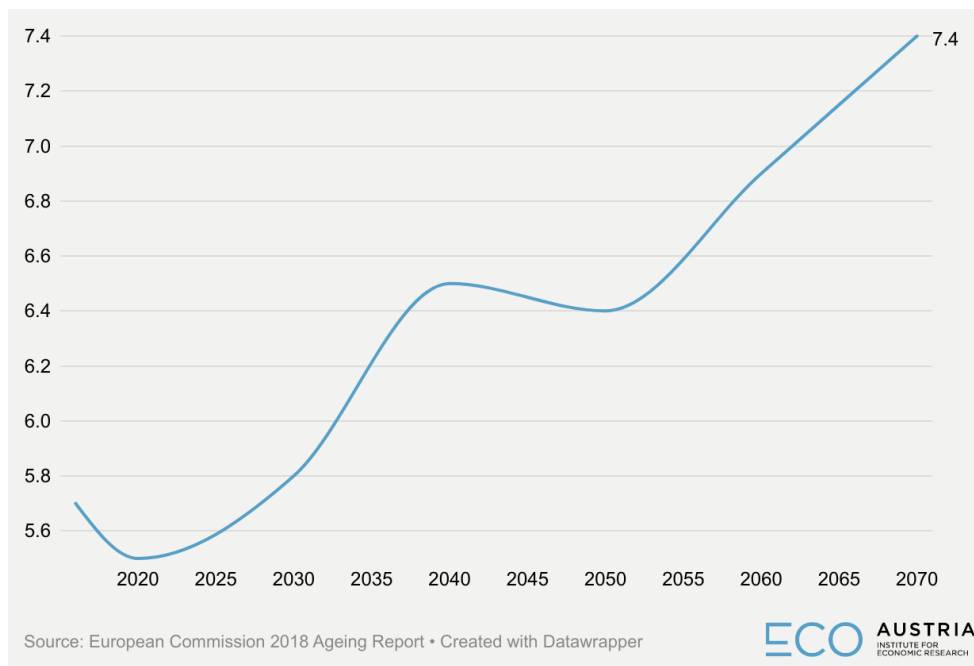
Gross public expenditure on pensions is comparatively low and below the OECD average, reflecting the absence of an earnings-related public scheme. It amounted to 7.1% of GDP in 2017, compared to the OECD average of 7.7%. However, there has been an increase of two percentage points since 2000, reflecting the aging of the population. It is still very low, however, and in Europe only the Netherlands, Ireland and Iceland have lower levels.⁷⁴

The old-age poverty rate, defined as the percentage of the population with an income below 50% of the median equivalized household disposable income, is slightly higher than the OECD average: 15.5% compared to the OECD average of 13.1%. They are also slightly higher than the poverty rate of the total population, at 12.4% in 2018. In particular, among older women, old-age poverty is significantly higher than the overall poverty rate at 19.2%.

The United Kingdom has slightly lower replacement rates than the OECD average. The (gross) replacement rate for a person earning the average wage is 49%, dropping to 38.2% for a person earning twice the average wage. The OECD averages are 51.8 and 44.4 respectively (OECD, 2021). On the other hand, replacement rates for people with lower incomes are generally higher than in many OECD countries: for a person earning 0.5 times the average wage, the replacement rate is 70.6%, compared with the OECD average of 64.5%. Lifetime accumulated pension wealth is comparable to most OECD countries, ranging from 13.2 times average male earnings for low earners to 6.8 times for high earners, and from 14.7 times for low earners to 7.6 times for high earners. The OECD averages are between 11.8 and 8 for men and 13 and 8.8 for women. This shows a similar pattern to the replacement rates: coverage is higher for low earners than the OECD average, but it is significantly lower for high earners. The latter fact is also related to the generally high dispersion of wages in the UK.

⁷⁴ The figures here are taken from the OECD dataset ([Weblink](#)), which is based on the 2018 ageing report. However, the Ageing Report 2018 reports a lower figure for 2016 for both definitions used (of Eurostat and the Ageing Working Group, AWG). For the AWG definition the expenditure was at 5.7% in 2016. To compare with other OECD countries, we have used the OECD data. Further on, however, we will report the projections by the AWG.

Figure 63: United Kingdom: Forecast of public expenditure on pensions (in % of GDP)

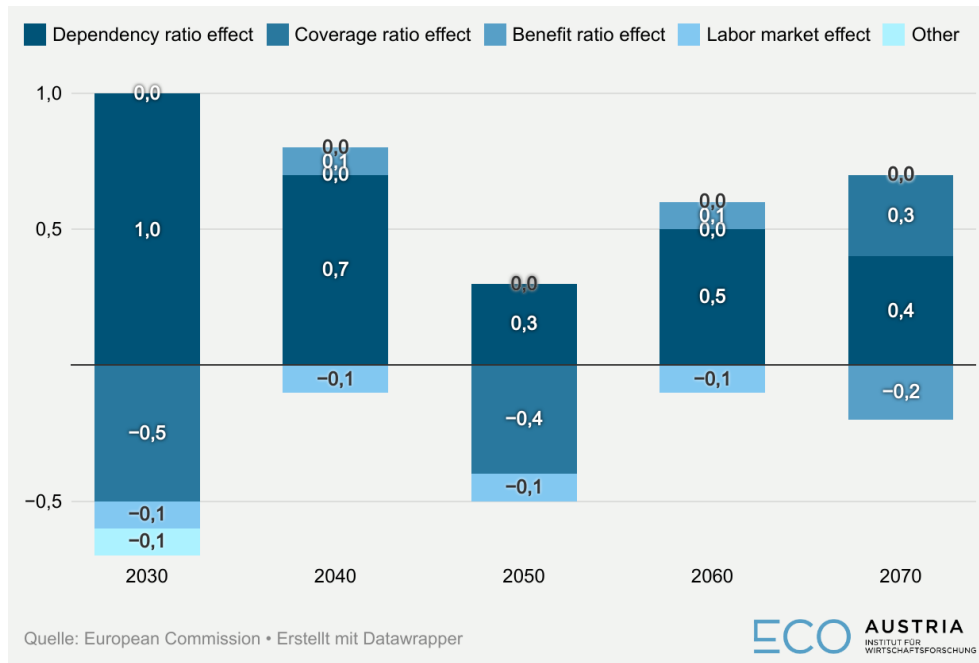


Forecast of the public expenditure

Public spending on pensions is generally comparatively low but is projected to increase by about 2 percentage points of GDP by 2070 from current levels as a result of population ageing (Figure 63). The projected increase in spending is highest between 2030 and 2040, partly reflecting the retirement of the baby-boom generation. The legislated change in the SPA in the mid-2040s leads to a flattening of projected spending until around 2050. The dynamics of pension expenditure can be broken down into the dependency ratio, the coverage ratio and the labor market effect (Figure 64).

The **dependency ratio** effect reflects the evolution of the ratio of the elderly (population 65+) to the working-age population. While this ratio is 27.9% in 2016, it is projected to rise to 43.5% in 2070. In the absence of other effects offsetting these adverse dynamics, ageing alone would increase public pension expenditure by 3.1 percentage points of GDP in 2070 relative to 2016, with the largest increase occurring in the first 20 years of the projection.

Figure 64: United Kingdom: Components of change in the public expenditure



The reduction of the **coverage ratio** goes back to the increase in the retirement age, which is successively raised to reach 68 years.

The changes due to the four effects are presented in Figure 64. Overall, until 2070 an increase due to decreasing dependency ratios of 3.1 percentage points is dampened by 1.1 percentage points with the decreasing coverage ratios and by 0.3 percentage points due to effects on the labor market.

Forecast of the replacement rates

Benefit ratios are shown in Table 35. As there is no earnings-related component in the public pension system, replacement rates in the earnings-related system cannot be defined. Benefit ratios in the basic public scheme remain constant until the end of the projection period and are projected to increase only slightly by 1 percentage point from the current level of 28%.

Table 35: United Kingdom: Benefit ratios until 2070

	2019	2030	2040	2050	2060	2070	change in pp
Overall benefit ratio	28%	29%	29%	29%	30%	29%	1.0

Source: European Commission • Created with Datawrapper

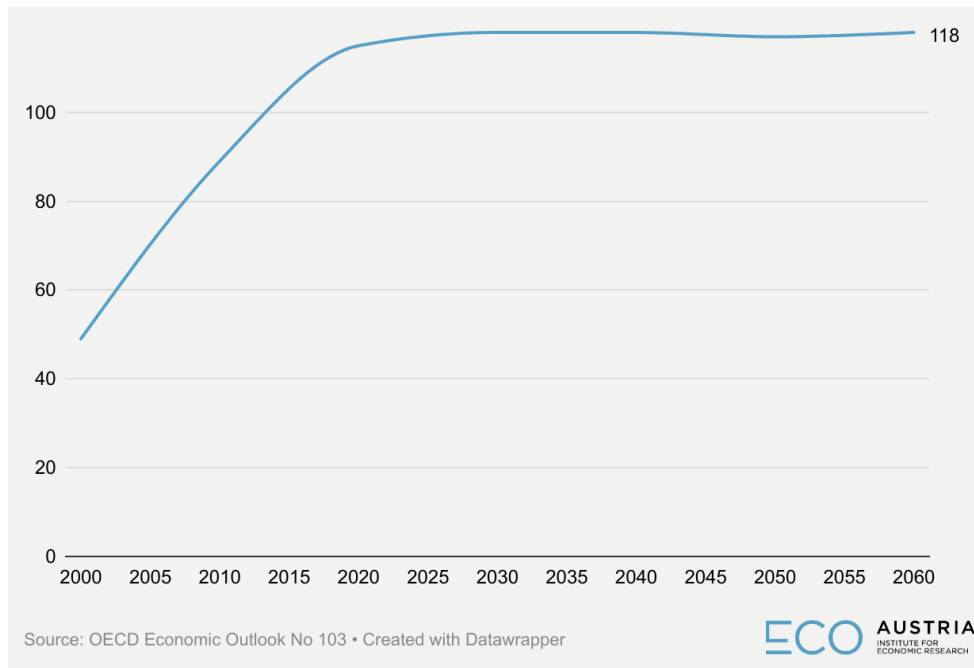
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Forecast of the debt levels

According to the OECD long-term projections, gross financial liabilities as percentage of GDP will rise above 110 % around 2020 and stay at this level until the end of the projection period in 2060 (see Figure 65). The pressure on the public finance comes from the population ageing, but it is

also driven by other factors. The peacetime record levels of government borrowing in response to the financial crisis and the COVID-19 pandemic pushed up government debt as a share of national income. Moreover, rising interest rates have put more pressure on the fiscal sustainability.

Figure 65: United Kingdom: Projection of long-term gross financial liabilities (in % of GDP)



The assessment of long-term fiscal sustainability can be based on the fiscal gap indicator that shows the upfront fiscal adjustment required to achieve specific long-term fiscal goals (see, DG-ECFin, 2019):⁷⁵

- the S2 indicator measures the fiscal effort required to stabilize government debt in the long term;

The S2 indicator measures the permanent adjustment in the structural primary balance that would be required to stabilize government debt in the long run. It consists of two components, namely (i) the "initial budgetary position", which measures the gap between the initial SPB and the debt-stabilizing structural primary balance, and (ii) future ageing costs. The United Kingdom is assessed to be at medium risk, with an S2 indicator of 4.3% of GDP, of which 3.3 percentage points are due to ageing costs. This is well above the EU-28 average of 2.4% and the EA average of 1.8%. Within ageing costs, the increase in pension expenditure accounts for the largest share (1.4 percentage points), followed by health care (1.1 percentage points) and long-term care (1 percentage point). The required primary structural balance for the United Kingdom is 4.1% of GDP, almost double the EU-28 average of 2.5% of GDP and above the euro area average of 2%.

⁷⁵ Debt Sustainability Monitor 2019 is the last one to include United Kingdom in the projections ([Weblink](#))

2.13.4. Funded Pensions (Second and third tier)

Voluntary/Mandatory, Occupational/Personal, Book reserves

There is a voluntary second-tier occupational pension scheme based on automatic enrolment, which was introduced in 2012. All employers are now required by law to enroll all eligible employees aged between 22 and state pension age who earn over GBP 10,000 in 2023/24 into a qualifying workplace scheme. In 2023/24, minimum contributions in most schemes are 8% of a band of earnings between GBP 6,240 and GBP 50,270 per annum before tax. They are formally split between 3% paid by the employer and 5% paid by the employee. While this is the legal minimum, payments can be higher in some programs - this is usually the case for defined benefit (DB) schemes. Due to automatic enrolment, the coverage of the schemes is quite high at 52% (in 2021). However, as the scheme has only recently been introduced, it is still lower than in other countries with automatic enrolment, such as New Zealand (80.8%), Lithuania (76.8%) or Estonia (69.2%). To support auto-enrolment, the government established the National Employment Savings Trust (NEST), a trust-based occupational defined contribution scheme, to ensure that all employers have access to a good quality, low-cost pension scheme. NEST has a public service obligation to accept all employers who wish to set up a pension scheme with it, regardless of income.

There are both DB⁷⁶ and DC schemes available to employees. Some basic statistics on enrolment in the different programs are given in Table 36. Membership is highest in DC schemes, but more than half of the members are 'deferred', i.e., a member who is no longer collecting benefits but has accrued benefits that will be paid out at a future date. Almost 40% of members are enrolled in (hybrid) defined benefit schemes (which may include elements of DC benefits). In terms of assets, private DB schemes account for the largest share, totaling GBP 1.4 trillion, or about 67% of the more than GBP 2.1 trillion in total assets. Including public DB schemes, almost 90% of assets are in DB schemes. However, there are plans to move to DC schemes from 2022, for example, individual employers can apply for permission to set up a collective defined contribution (CDC) scheme from August 1, 2022.⁷⁷

⁷⁶ Including hybrid defined-benefit schemes (DBH). A hybrid scheme is an occupational pension scheme where members have either a choice, or mixture, of DB and DC pension entitlements. In a 'pure' hybrid arrangement, members receive benefits that are a mixture of DB and DC. In a 'mixed hybrid' scheme, there are separate DB and DC groups of members (often organized in separate sections of the scheme).

⁷⁷ <https://www.aon.com/unitedkingdom/media-room/articles/aon-says-new-legislation-first-august-is-cdc-day>

Table 36: United Kingdom: Descriptive statistics for the funded occupational schemes

	DC	Private sector DB	Public sector DB	Sum
Membership (in Million)	28.6	9.9	7.7	46.2
Membership (in %)	62.0%	21.4%	16.7%	100.0%
Benefits (in Million GBP)	562	12,025	4,283	16,870
Contributions (in Million GBP)	6,567	5,090	3,458	15,115
Assets (in Billion GBP)	223	1,415	485	2,123

Data for Q4/2022; 'Public sector' refers to pension schemes for public sector employees (i.e. schemes where Government is the pension manager) and 'private sector' refers to pension schemes for private sector employees including those covered by the Pension Protection Fund.

Source: Office for National Statistics • Created with Datawrapper

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In addition to occupational schemes, there are voluntary products (third tier). However, the coverage of voluntary personal plans was at 5% in 2021, which is low by OECD standards. Personal pensions in the UK are individual pension schemes, usually defined contribution plans that are available to everyone. They are private pension schemes that can be set up independently of an employer or through some workplaces. There are several types of personal pensions, including *stakeholder pensions*, which must meet certain government rules such as charge limits, and *self-invested personal pensions* (SIPPs), which give the beneficiary more control over the investments in the pension fund.

Stakeholder pensions need to meet certain basic standards established by the government. These standards include:

- **Capped Charges:** The fees charged on the value of the pension pot cannot go beyond 1.5% annually for the first ten years and then decrease to 1% per year. If an employer uses a stakeholder pension for their automatic enrolment duties, there's a limit of 0.75% on charges.
- **Free Transfers:** Beneficiaries are able to transfer their pension without any additional charges.
- **Flexible Contributions:** Individuals can stop or restart their contributions whenever they wish, without facing any penalties.
- **Low Minimum Payments:** The minimum contributions should not be more than GBP 20.
- **Default Investment Option:** If no active investment choice is made, the money will be invested in a default investment fund.

A self-invested personal pension (SIPP) serves as a pension "wrapper" designed to facilitate the accumulation of funds for retirement through saving and investing. Functioning as a variant of a personal pension, it operates comparably to a conventional personal pension. In the context of a SIPP, individuals have the autonomy to personally select and oversee their investments or alternatively engage an authorized financial advisor for assistance. This empowerment grants the ability to modify and augment investments as frequently as desired. Notably, SIPPs present a

significantly broader spectrum of investment choices compared to other pension categories, thereby enabling participation in an extensive array of assets.

Most personal pensions establish a specific age at which individuals are eligible to commence withdrawing funds from them. Generally, this age threshold is set at 55 years or later. As explained later, specific taxation rules apply to the income from private pensions.

Investment regulations

In 2013, the legislation introduced a 100% limit on direct equity exposure (as well as all other relevant classes). In addition, pension funds are subject to a 100% ceiling in equity investment from a single issuer. To avoid conflict of interest there are 5% limit in employer-related investment and employer-related loans are not allowed. There is no limit on foreign investments whatsoever, nor a limit on foreign currencies exposure. There is no quantitative limit on derivatives, but derivative investments may be made only in so far as they— (a) contribute to a reduction of risks; or (b) facilitate efficient portfolio management (including the reduction of cost or the generation of additional capital or income with an acceptable level of risk), and any such investment must be made and managed so as to avoid excessive risk exposure to a single counterparty and to other derivative operations. In general, the assets must be properly diversified to avoid excessive reliance on any particular asset, issuer, or group of undertakings and so as to avoid accumulations of risk in the portfolio as a whole. This requirement is derived from the EU IORP Directive (OECD, 2022c).

Assets allocated

Seven countries held more than 90% of the total OECD pension assets. The United States has the largest pension market within the OECD, with assets worth USD 40 trillion, representing 67.3% of the OECD area total. The United Kingdom recorded the second largest amount (USD 3.8 trillion, i.e., 6.3% of OECD pension assets in 2021). Expressed in percentage of GDP, United Kingdom ranked in 2021 high at 120.5% in 2021, and above the OECD average of 105.1%. According to preliminary data for Q3/2022 assets shrunk strongly and currently would equal only about 88.7% of GDP.

Although there are no specific rules or limits on asset class holdings or foreign investments, pension plans tend to invest conservatively. In 2021, 26.4% were invested in equities, 40.9% in bills and bonds, and the remainder in other asset classes such as loans, land and buildings, unallocated insurance contracts, hedge funds, private equity funds, structured products, other investment funds (i.e., not invested in equities, bills and bonds, or cash and deposits), and other investments. Among bills and bonds, about three-quarters are issued by the public sector. Among equities, 56% are invested in listed equities and the rest in unlisted equities. In the "other" category, most of the invested assets are allocated to mutual funds, with less than 10% in other classes. Regarding investments in foreign assets and currencies, while there are no limits on this issue, most assets are invested domestically. Only 14% of assets were invested abroad in 2021.

Investment performance

As most of the assets are allocated to defined benefit programs, it is relevant to look at the funding ratio of these programs. It has been fairly stable around 100% for the past 15 years, ranging from 79.6% in the financial crisis of 2009 to more than 100% in 2021. While the financial situation is stable, it is comparatively low by OECD standards, with most other countries having higher funding ratios for DB schemes, e.g. 137.2% in Finland, 132% in Germany, 132.3% in Ireland and 114.8% in the Netherlands (in 2021). If the funding of schemes is not guaranteed, there are mandatory recovery plans in the United Kingdom, which may, for example, involve additional contributions from employers. In addition, the UK has the Pension Protection Fund, which can take over the liabilities of a DB plan and pay benefits to members if an employer goes bankrupt or an underfunded plan is wound up.

Tax treatment

Pensions Funds in Great Britain are subject to an approximate EET regime, where beneficiary's contributions and funds' returns on the investments (including equity and dividends) are exempted, while withdrawals are subject to taxation (or partial exemption).

Contributions to registered pension schemes benefit from tax relief up to an annual limit (annual allowance). Individuals pay tax at the marginal rate of income tax on any pension savings they have in that tax year above the annual allowance. For occupational pension schemes: usually, the employer takes the pension contributions from the individual's pay, before deducting tax. The individual only pays income tax on what is left. This system of giving tax relief is known as "net pay arrangement". For other workplace pensions: the employer takes the pension contributions from the individual's pay after deducting tax. The pension provider claims tax back from the government at the basic rate of 20% and the tax refund is paid in the pension account. Individuals paying tax at higher rate (40%) or additional rate (45%) can claim the difference through their tax return. For personal pensions: the relief at source method applies. Individuals pay income tax on their income before any pension contribution, but the pension provider claims tax back from the government at the basic rate (the tax refund is paid in the pension account) (OECD, 2022b).⁷⁸

The income and gains from most investments held in registered pension schemes are not taxable. There is a cap on the total amount that can be accumulated in a private pension plan that an individual can get tax relief on (lifetime allowance). This is currently set at GBP 1 073 100 (fixed at this level until 2025/26). Individuals building up pension savings worth more than the lifetime allowance will pay a tax charge on the excess.

Pension income is taxed at usual income tax rates. Annuities, programmed withdrawals, and lump sums are all taxed as income at the marginal rate of income tax. Income from workplace and personal pension schemes is paid to the individual by the pension or annuity provider. Pension savings accessed before the normal minimum pension age (currently age 55) are charged a 55% rate (unauthorized payments charge and unauthorized payments surcharge) (OECD, 2022b).

⁷⁸ For specific information on the allowances and limits please consult this [Weblink](#).

2.13.5. Highlights and main features of the system

1. Strengths and weaknesses (according to Overall Pension Index – OPI)
<ul style="list-style-type: none"> - The UK pension system shows good results with regard to “Market capitalization” (with an OPI score of 0.74 and ranked 3rd among 11 countries). The UK system is ranked in the middle of the countries observed as regards “Adequacy” (OPI score of 0.64, ranked 6th). - The overall pension system shows weak results in terms of “Equitability” (OPI score 0.27, ranked 10th). Replacement rates are slightly lower than the OECD average and old-age poverty is slightly higher.
2. Tax treatment
<ul style="list-style-type: none"> - 2nd tier: EET; 3rd tier: EET.
3. Contribution rate to funded plans and split between employer and employee
<ul style="list-style-type: none"> - As regards 2nd tier occupational FDC pensions, OECD reports minimum contributions of 8% of earnings in 2021, if employees opt into the FDC scheme. Of this, 5% is paid by the employee and 3% by the employer (Pension Markets in Focus 2022, 20; Pensions at a Glance 2023c, 209).
4. Asset Allocation
<ul style="list-style-type: none"> - In the year 2022 according to OECD: Equities (26.4%), Bills & Bonds (40.9%), Cash & Deposits (1.8%), Other* (30.9%) <p><small>* Assets invested in loans, real estate (land and buildings), unallocated insurance contracts, private investment funds and other alternative investments.</small></p>
5. Obligatory character
<ul style="list-style-type: none"> - Occupational schemes are subject to auto-enrolment from 2012. Individual pension plans are voluntary.
6. Pay-out options of funded plans
<ul style="list-style-type: none"> - With DB and DC two types of funded pensions exist. Occupational “workplace” pensions are mostly DB. A regards DB, capital from can be taken-out at the start of the pay-out phase as a tax-free lump sum of up to 25%. The remaining 75% of the capital can then be withdrawn within 6 months, but is subject to taxation. The (remaining) capital is transferred in a lifetime annuity, if the lump-sum option is not (fully) taken. - DC plans can be either “workplace” pensions, arranged by the employer, or private pensions. There are 3 pay-out options. The 1st is, taking out all or part of the capital as lump-sum. As for DB plans, the capital can be paid-out “tax-free” up to 25%. The 2nd option is to “buy” a product that translates the capital into a guaranteed annuity income. The 3rd option is a combination between an “adjustable” annuity and further investment of the remaining capital (“flexi-access drawdown”).
7. Contributions to funded plans as percentage of GDP
<ul style="list-style-type: none"> - According to OECD Pension Markets in Focus 2022 (OECD 2023) the volume of contributions to all forms of funded schemes was 2.6% of GDP in 2021.
8. Investment performance
<ul style="list-style-type: none"> - For DB systems, which are most relevant for occupational pensions in the UK, funding ratios are a relevant performance indicator. Funding ratios were at 100% for the past 15 years, ranging from 80% in 2009 to more than 100% in 2021. The funding ratio are relatively low by OECD standards.

Additional information and results

- The United Kingdom does not have a second-tier PAYG system. Pensions above the basic state pension are therefore only available in the form of funded occupational and private plans.
- Occupational schemes are subject to auto-enrolment from 2012.
- Ageing is slower than in other countries and the pressure on public finances is less pronounced. However, there is a medium- and long-term risk to public finances.
- Replacement rates are slightly lower than the OECD average and old-age poverty is slightly higher.
- Recent reforms, such as raising the retirement age to 68 and increasing contribution rates to funded plans to 8% of earnings, have alleviated some of the pressures of ageing.

2.14. Comparisons

The following section provides a systematic country comparison based on quality criteria for pension systems. This analysis synthesises the 11 country studies above based on key indicators, but also goes beyond them by adding new indicators to the assessment of quality criteria. The indicators analysed in this approach follow a multidimensional scheme of quality criteria for pension systems. The key indicators form the data basis for a consolidated “Overall Pension Index” (OPI), which measures the overall quality of the pension systems. The dimensions or criteria used are derived from the literature on quality aspects and evaluation criteria of pension systems. The World Bank’s conceptual framework for pension systems forms the basis of the criteria scheme (see World Bank 2008). This framework looks at the pension system as a whole, and the criteria apply across all pillars and segments of the pension system. This means that a holistic view is taken, regardless of the specific design of individual elements, e.g., whether they are mandatory or individual, whether they have financing elements of PAYG or funding, or whether they are defined-benefit or defined-contribution systems. This approach considers the fact that pension systems may be structured in different pillars and segments, but as a whole fulfil certain socioeconomic functions that are independent of the design of individual elements. The following criteria are used to assess pension systems.

Adequacy

The adequacy criterion is met by systems that successfully prevent old-age poverty on a universal basis, i.e., for the whole population, and that provide a reliable basis for smoothing lifetime consumption. The quality of pension systems is reflected in their ability to prevent age-related risks. In contrast to younger people, older people tend to have reduced earnings capacity. Therefore, people are motivated to smooth lifetime consumption, i.e., to reduce consumption in younger years to save and maintain consumption and living standards in later years.

Sustainability

To meet the long-term functions of pension systems over the life course, pension systems need to be sustainable. Sustainable systems are financially sound and can be reliably maintained over a foreseeable period under a broad and reasonable set of assumptions. The functioning, and hence the social and political legitimacy, of pension systems depends on confidence in their ability and reliability to maintain wealth and consumption capacity in later life.

Affordability

Affordability is achieved by ensuring the financing capacity of all underlying funding or financing mechanisms, whether individual, social, or public. This criterion applies to systems regardless of the design of individual levels and elements and whether they are publicly or privately funded. Therefore, sustainable systems must not crowd out other social or economic needs and functions or have undesirable fiscal consequences.

Equitability

Equitability aims at both social equality and equity. Equitability is thus reached by a compromise of social redistribution from rich to poor and providing equivalency and symmetry over the

transition from work to retirement. Equitability considers the distribution of wealth among the insured participants in a system according to the respective societal objectives and preferences. As noted above, the criterion reflects not only redistributive aspects, but also aspects of equivalence between lifetime earnings, contributions paid, and benefits received. For example, an equitable system might provide for income redistribution from the lifelong rich to the lifelong poor according to social preferences. At the same time, as mentioned above, pension systems aim to smoothening consumption over a lifetime, assuming that accumulated pension rights and entitlements are treated somewhat equally between individual members. For instance, a defined-benefit system is seen as equitable when it provides the same benefit for service across income groups and cohorts, for both men and women, groups of professions and so on. An equitable system is often seen as one that does not tax or burden workers and pensioners across different generations and external to the system.

Predictability

The criterion of predictability is based on the principles of reliability and the protection of trust. Thus, a predictable system provides benefits that are institutionally guaranteed, for instance specified by law, and that are not subject to the discretion of policymakers or administrators. Furthermore, a predictable system includes indexation provisions designed to cover the individual from the risk of inflation, wage, and interest rate adjustments before and after retirement. Thirdly, a predictable system must cover retirees as much and as long as possible from risks of longevity.

Robustness

A robust system is one that has the capacity to withstand major shocks, including those arising from economic, demographic, and political volatility and unpredictability. The functionality of pension systems is threatened by systemic risks, some of which are not foreseeable. The lack of foresight must therefore be captured in the institutional framework to achieve the objective of reliability and trustworthiness. Reliable and trustworthy pension schemes must, as far as possible, protect against systemic risks that are exogenous to the particular pension scheme.

Market capitalization

The criterion of market capitalization is added to the World Banks list of quality criteria. As shown above, pension systems are mostly set up by different institutional components, comprising elements of publicly funded PAYG and funded financing mechanisms. The idea behind this criterion is that funded pension schemes release investment capital. As a result, investment from funded pensions assets could be a source for innovation and business dynamism. There is evidence that countries with more developed funded pension markets perform better in terms of innovation.

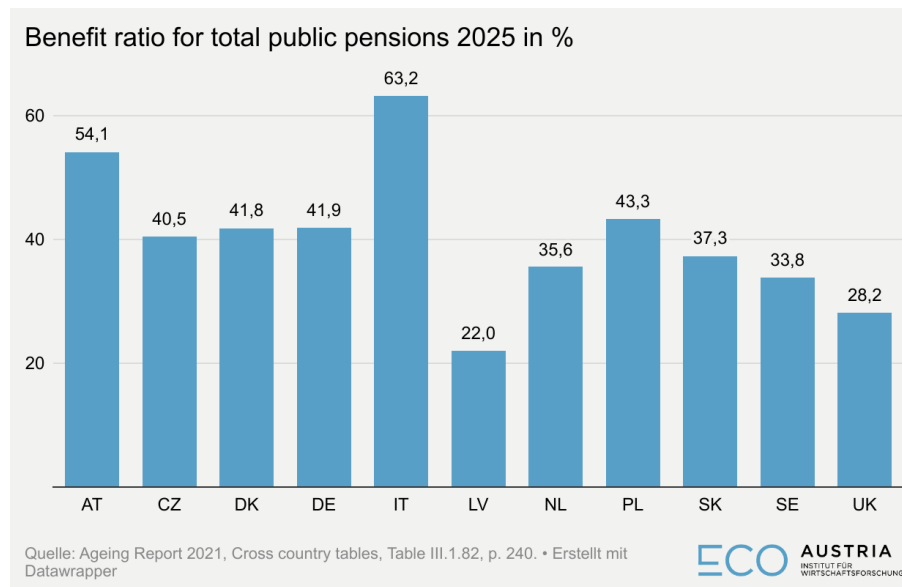
2.14.1. Adequacy

First, the adequacy dimension is taken into account. Adequacy is met if a pension scheme can prevent old-age poverty and furthermore provides a reliable foundation for smoothening lifetime consumption.

Current benefit ratio for public pensions

For public pensions, the first quality indicator is the benefit ratio provided under the public scheme. The benefit ratio reflects the ratio of public pension benefits to wages and is therefore a suitable indicator of the capacity of the public pension system to smooth lifetime consumption. Data for the country comparison are taken from the 2021 Ageing Report (EU 2021). The values compared refer to public pension benefit ratios in the year 2025. For the UK, data is taken from the 2018 Ageing Report, which provides information for the year 2025.

Figure 66: Benefit ratio for total public pensions 2025 in percent



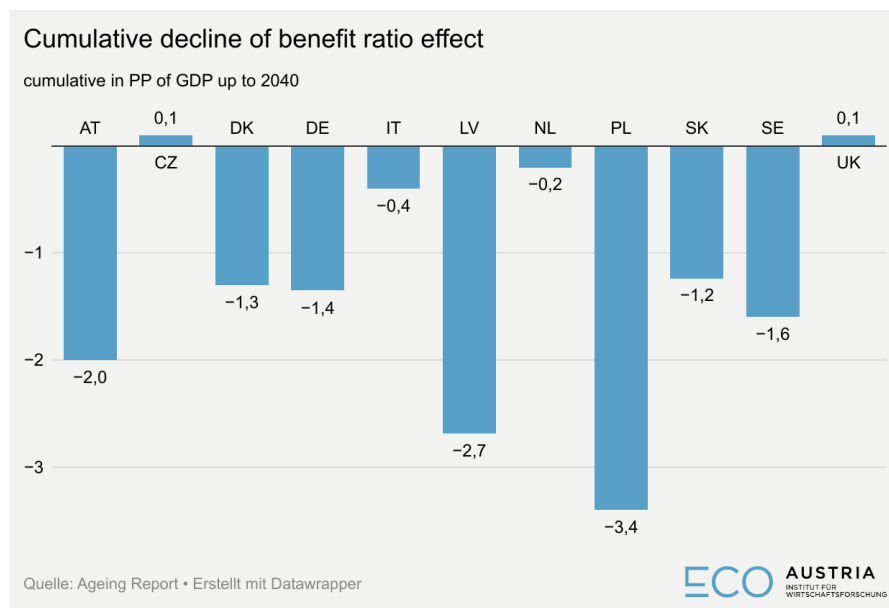
The observed countries show a wide variation in the benefit ratios of total public pensions. This is also due to the institutional set-up and constitution of pension systems. The countries differ in terms of the importance of first- and second-tier public pension schemes in providing income security for pensioners. Some countries, for example the UK or the Netherlands, have a stronger focus on occupational or privately funded schemes and supplements. Conversely, countries that rely on public PAYG systems more intensely, such as Italy or Austria, also have higher public pension benefit ratios. However, in terms of adequacy and independently of the following quality criteria and indicators, Italy has the "strongest" pension system, with a benefit ratio of 63.2% in 2025. Italy is followed by Austria with a benefit ratio of 54.1%. Among the countries observed, Latvia has the lowest benefit ratio at 22%. Also, the Netherlands (35.6%) and the UK (28.2%) have lower benefit ratios. These two belong to the group of countries that, as mentioned above, place greater emphasis on funded occupational and personal pension schemes.

Future benefit ratio for public pensions

For the adequacy criterion, not only the current benefit ratio as shown above is relevant. The adequacy criterion must also be assessed in the light of future developments. In recent years most of the countries that are observed in our comparison, have adopted pension reforms to alleviate the financial pressures of ageing societies. In the context of adequacy, the expected

future development of the benefit ratio is also relevant to the assessment. As shown in Figure 74 beneath, declining benefit ratios, expressed by negative benefit ratio effects, are the most important component in offsetting financial pressures. Pension reforms that affect the benefit ratio, make pension systems more stable and thus sustainable, but may have a negative impact on adequacy. This is especially the case for countries with stronger focus on PAYG and unfunded pension schemes. The second indicator considered is therefore based on the projection of benefit ratios given in the EU Ageing Report. This step is based on the cumulative benefit ratio effect from 2019 up to 2040. The data basis for this is, as mentioned, the 2021 EU Ageing Report (EU, 2021). The benefit ratio effect shows how the average pension will develop relative to the average wage, considering the pension reforms adopted so far. The value is expressed as percentage points of GDP. The indicator shows the extent to which the reduction in benefit ratios contributes to a reduction in public pension spending. This is here interpreted here as a deterioration in adequacy in favour of increased sustainability. The sustainability criterion is considered later in this report.

Figure 67: Cumulative decline of the benefit ratio in PP of GDP up to 2040



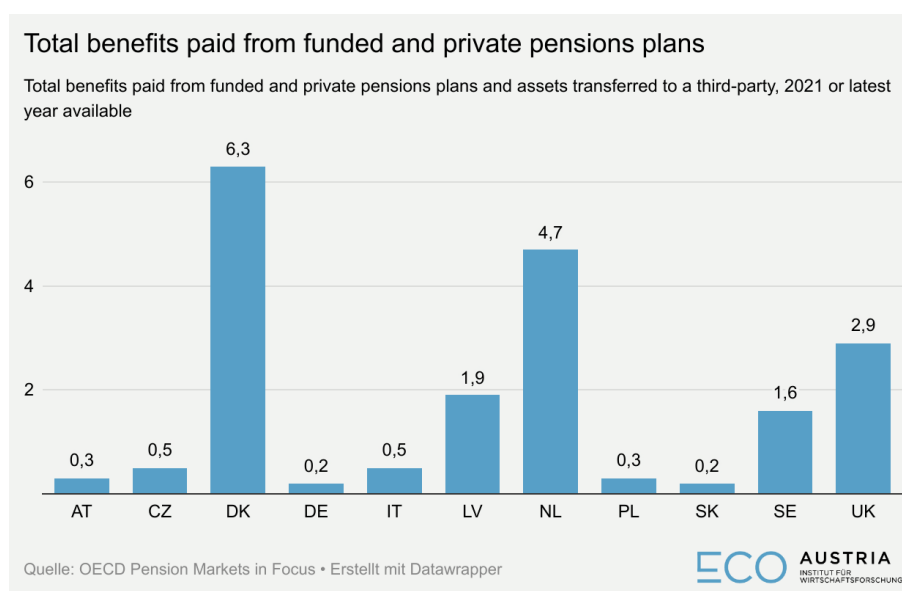
As shown in Figure 67, the observed countries vary in extent to which the benefit ratio offsets the increase in public pension spending. The countries with the largest decline in the benefit ratio by 2040 are Poland (-3,4), Latvia (-2,7) and Austria (-2,0). A negative benefit ratio effect is observed for almost all countries, although to a lesser extent than in Poland, Latvia, and Austria. Exceptions are the United Kingdom and the Czech Republic. Here, the effects of the benefit ratio effect are constant and slightly positive, indicating constant and thus adequate replacement rates.

Importance of funded pension plans

Benefit ratios indicate the generosity of public pension systems. Generosity is relevant for assessing adequacy. However, it seems necessary to point out that pension systems with lower benefit ratios in their public schemes may compensate for this "disadvantage" through more

important funded schemes. Thus, lower benefit ratios do not necessarily indicate an overall weakness regarding the adequacy criterion. For example: The Dutch pension scheme provides for rather “weak” benefit ratio of 35.6 (Figure 66). However, the Netherlands is, according to OECD Pension Markets in Focus 2022 (OECD, 2023), one of the countries with the highest benefits from funded plans paid to third parties. Benefit payments, according to the definition applied by OECD, represent outflows from pension plans and therefore reduce the amount of assets in the plans. This can take several forms: They can be a lump sum payment, a regular stream of income from pension benefits or withdrawals in the retirement phase, which is mostly the case in the Netherlands, or a combination of the two. Benefit payments can be paid as a full or partial lump sum under certain conditions in some countries. In Latvia for example, individuals with assets in individual privately funded schemes may transfer their assets to the State Social Insurance Agency, which then combines these assets with the ones accumulated in public mandatory NDC system (see above in section 2.8). Alternatively, retirees can transfer their pension capital to a life-insurance company. In the OECD's consideration, these transfers are included as an amount to another party (in the case of Latvia either a public social insurance agency or a private insurance company). Back to the Netherlands: At 4,7% of GDP the Netherlands is one of the countries in our comparison with the highest benefits from funded and private schemes. Latvia also has a higher level of benefit payments (1.9% of GDP) than, for example, Austria (0.3% of GDP) (OECD, 2023, p. 26).

Figure 68: Total benefits paid from funded and private pension plans 2021

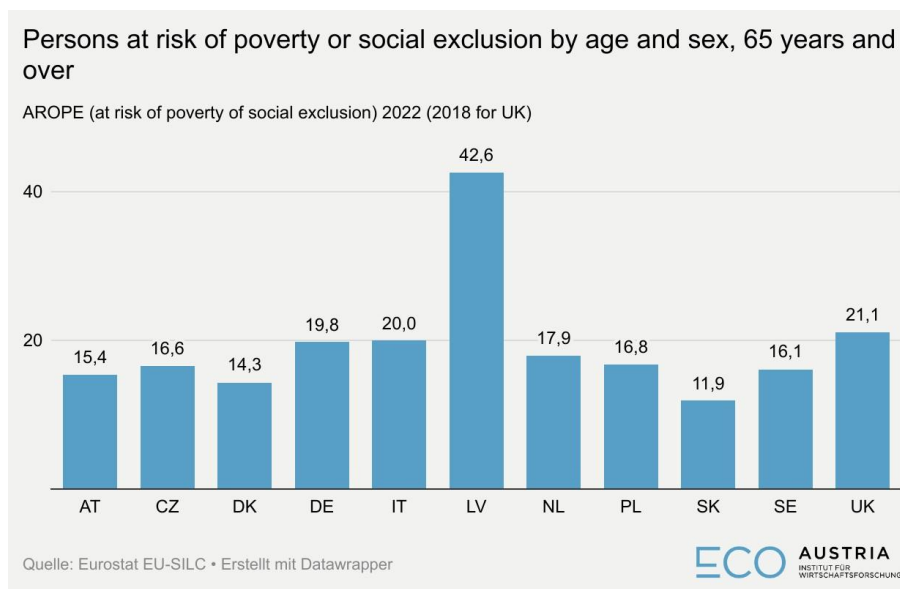


In our comparison, Denmark is by far the country with the highest benefits paid from funded and private schemes, reaching 6.3% of GDP in 2021. Denmark is followed by the Netherlands and the UK (2,9%). Sweden and Latvia form the midfield with benefits paid out of 1.6% and 1.9% respectively. All other countries observed show smaller benefits paid out from funded and private pension plans, up to 0.5% of GDP for Italy.

Risk of poverty or social exclusion

For the evaluation of our criteria, it is also important to take a view on indicators that are more impact-oriented rather than performance-oriented. In the definition used here adequacy is defined as the ability to prevent old-age poverty and smooth lifetime consumption. To assess the ability of a pension system to prevent old-age poverty, the at-risk-of-poverty or social exclusion rate (AROPE) according to EU-SILC is used. The indicator corresponds to the share of persons who are either at risk of poverty, or severely materially and socially deprived or living in a household with a very low work intensity. People are included only once even if they are in more than one of the situations mentioned above. The AROPE ratio⁷⁹ is the proportion of the total population that meets the conditions for risk of poverty or social exclusion.

Figure 69: Older persons at risk of poverty or social exclusion, 65 years and over



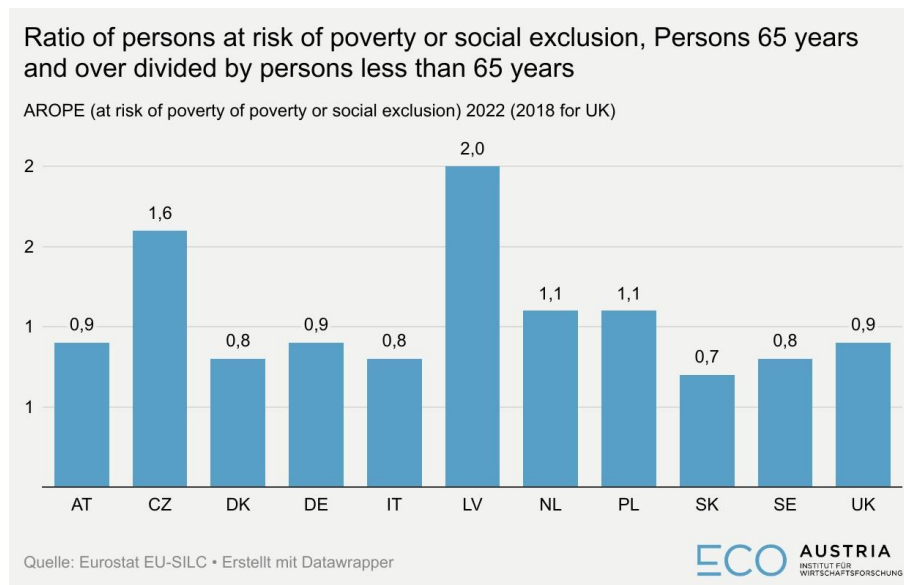
For the evaluation of the pension system, two basic approaches are relevant. First, countries are compared with each other directly based on the AROPE share of older persons from 65 years. Higher values signal a greater potential or risk of poverty and social exclusion in a country, while lower values are evaluated in a correspondingly positive way. A second perspective is based on the relative ratio of older persons' AROPE share to the referring national population. This perspective focuses specifically on the ability and adequacy of the pension system to impact poverty and exclusion in a country relative to the overall distribution system in a country. If a pension system succeeds in having a positive impact on poverty and exclusion, this is rated in a positive manner accordingly. This second perspective is assessed by the ratio of the AROPE share of persons from 65 years at risk of poverty or exclusion to the comparative share of persons under 65 years. A country's lower ratio indicates that, compared to the overall distribution, older persons are less likely to be at risk of poverty and social exclusion. Such a characteristic is

⁷⁹ AROPE is the main indicator to monitor the EU 2030 target on poverty and social exclusion and was the headline indicator to monitor the EU 2020 Strategy poverty target.

considered positive for the evaluation of the pension system. The results show a rather balanced picture in our country comparison. The AROPE share of persons from 65 years varies from 11.9% in Slovakia to 20% in Italy and 21% in the UK⁸⁰. Only Latvia is presented an outlier, with an AROPE share of 42.6%. At 11,9% the Slovak Republic is the country with the lowest at-risk share for older persons in general.

As noted, a second perspective looks specifically at the impact of pension systems on the risk of poverty or exclusion in the context of the situation of the whole population. The rationale for this second view can be illustrated by the example of the Czech Republic. With an AROPE share of 16.6% for persons from 65 years, the values for the Czech Republic in Figure 69 are basically similar to those of the other countries. This compares with a risk ratio of 15.4% in Austria. For the Czech Republic, however, it should be considered that the AROPE share of persons aged 65 and over is distinctively higher than the corresponding share of persons aged under 65 (10.5%). The AROPE rate for older people in the Czech Republic is thus more than by a third higher than the comparable value for younger people under 65. When assessing the adequacy of the pension system in the Czech Republic, it must be considered that in particular elderly have a significantly higher and above-average risk rate relative to the national reference population.

Figure 70: Ratio of AROPE shares for persons from 65 years compared to persons under 65 years



In terms of the ability to reduce risks of poverty and exclusion relative to the overall situation, most of the countries show high performance. Of the 11 countries considered, 9 countries have values around 1, indicating that the risk of poverty or exclusion for people aged 65 years and over in these countries does not significantly deviate from the younger population. In Austria, Denmark, Germany, Italy, Slovakia, Sweden and UK, older persons even have a lower risk. This situation

⁸⁰ For the UK no data is provided for 2022 by Eurostat. For the UK, the latest available data for the year 2018 are taken into account.

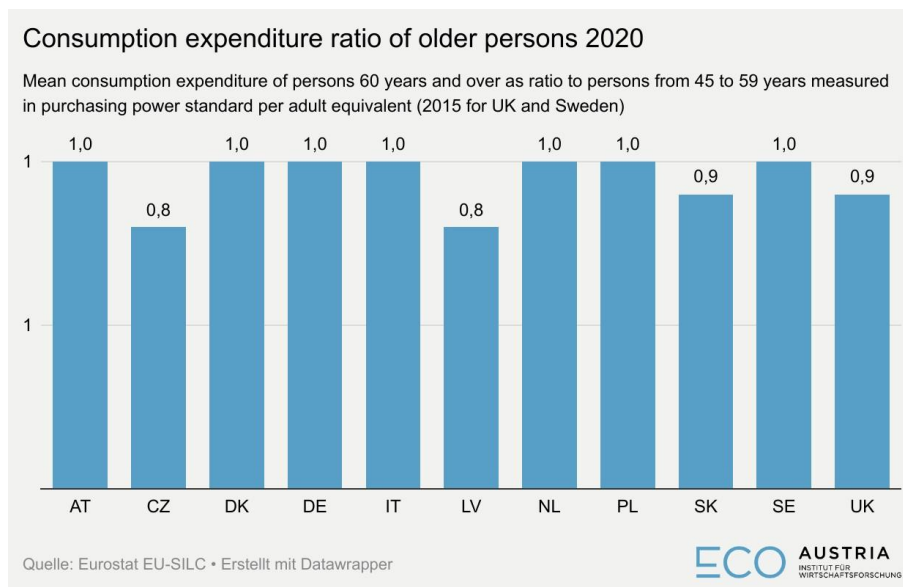
differs for the Czech Republic and Latvia. Here, the older population is facing a significantly higher AROPE risk.

Consumption expenditure

The ability to smooth lifetime consumption is a second impact-oriented indicator. The rationale here is that pension systems, independent from their particular design, should enable individuals to ensure a livelihood and an appropriate level of consumption in their later years. This can be analysed by looking at consumption expenditure by age groups. EU-SILC data provide information on the average consumption expenditure of individuals. Thereby, mean consumption expenditure in purchasing power standards per adult equivalent is analysed. No data is available for the UK as non-EU member state. This also applies to Sweden.

The following analysis is based on the ratio of the average consumption expenditure of older persons aged 60 and over relative to the comparable value of persons aged 45 to 59. Values around 1 indicate a balanced ratio, i.e., the elderly have a similar level of consumption expenditure compared to the younger population. This is seen as a positive indication that a smoothing of lifetime consumption is being achieved in the respective country. Conversely, values below 1 indicate that the older population actually has a lower consumption expenditure.

Figure 71: Consumption expenditure of persons aged 60 and older compared to persons aged 45 to 59 years



As shown in Figure 71, almost all the countries observed have a rather balanced consumption expenditure ratio. This underlines that the smoothing of lifetime consumption is achieved in these countries. In Austria, Denmark, Germany, Italy, the Netherlands, Poland and Sweden⁸¹, the ratio is exactly 1. Only the Czech Republic and Latvia (0.8), to a lesser extent also Slovak Republic

⁸¹ For Sweden and for the UK no data is provided for 2020 by Eurostat. For both countries the latest available data for the year 2015 are taken into account.

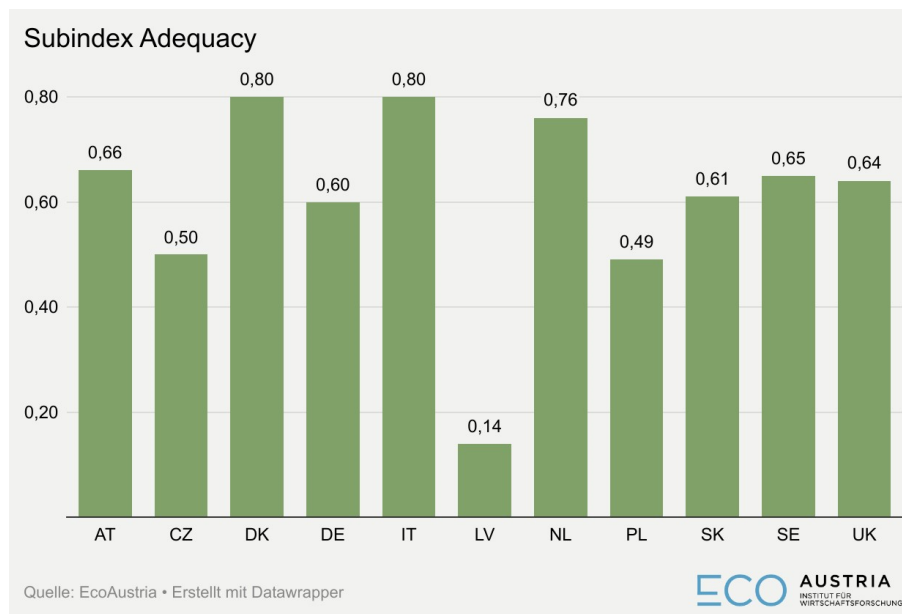
and the UK (0.9), deviate from the other countries. Here, older people aged 65 and over have lower consumption expenditure than the younger reference group aged from 45 to 59 years.

Synthesis Adequacy

Adequacy describes the ability of pension systems to contribute to the smoothing of lifetime consumption and the prevention of old-age poverty. The criterion of adequacy was assessed using 6 core indicators. These are (1) the current benefit ratio for public pensions, (2) the future development of the benefit ratio given pension reforms already adopted, (3) benefits paid out to third parties from private and funded pension schemes, (4) the AROPE ratio of the elderly population aged 65 and over the (5) the relative AROPE ratio of the elderly population to the reference group of persons younger than 65, and (6) the average consumption expenditure of the elderly population aged 60 and over compared to that of the population aged 45 to 59.

A synthesis is presented by a summary subindex for the adequacy criterion. For this purpose, the values of the individual countries were put on a uniform scale between 0 and 1. The value 1 is assigned to the “best value”, the “worst value” is given the value 0. The other countries are assigned to the 0/1 scale according to their value for the respective indicator. The direction of the assessment is consistent, regardless of whether the best value is a maximum value, as in the case of the benefit ratio, or a minimum value, as in the case of the AROPE rate. The overall index score of is calculated as the average value of the single indicators.

Figure 72: Synthesis Subindex Adequacy

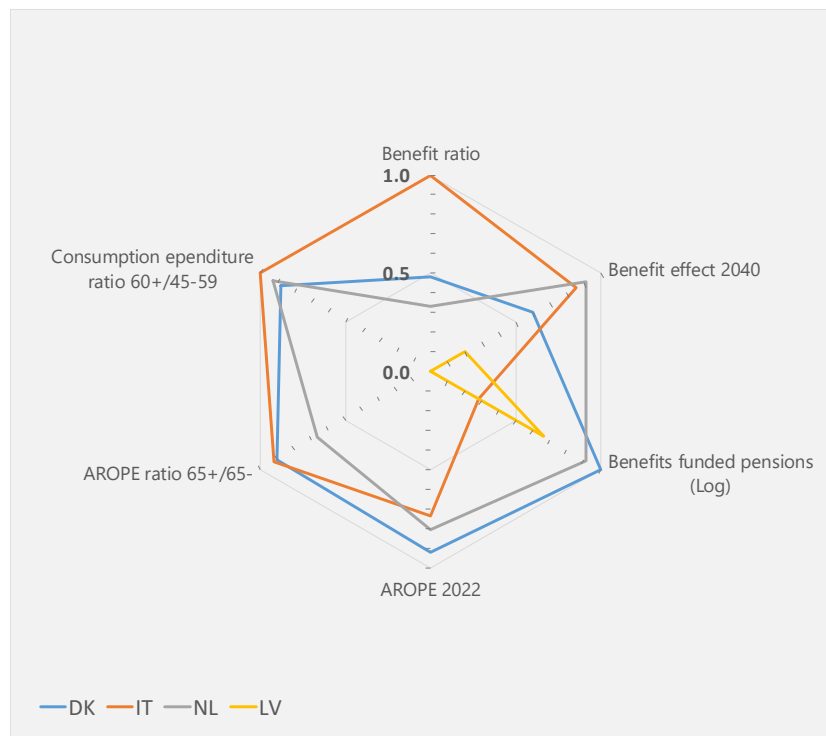


The summary index for the adequacy criterion (Figure 72) shows that the adequacy targets are most likely to be met in Denmark, the Netherlands and Italy. These three are the leading countries regarding adequacy. This does not mean that these countries are also the best performers in the other components of our scoring system. Italy, for example, shows disadvantages in terms of sustainability (Figure 84).

The three leading countries have different strength/weakness profiles in terms of adequacy. For Italy, strengths are particularly evident regarding the current benefit ratio and the current distribution of the risk of poverty and social exclusion. These strengths tend to focus on the current setup of the public mandatory pension system. Among the 11 countries observed, Italy has the highest benefit ratio in 2025. At the same time Italy has the second lowest relative AROPE-ratio for persons aged 65 relative to the reference population aged under 65, and Italy shows a smooth consumption expenditure at the age limit of 60. However, Figure 73 already indicates the weaknesses of the Italian system. By 2040, the benefit ratio is set to decline significantly, while and the funded pension pillar is weakly developed and thus hardly able to compensate for the declining adequacy of the public scheme.

Denmark contrasts with Italy. Here, the weakness is most likely to captured in the area of public pensions. The benefit ratio is only average, and further reductions in the benefit ratios are institutionalized. However, Denmark has a well-developed funded pension pillar and is therefore well prepared for the decreasing generosity and thus adequacy of public systems. Moreover, Denmark scores very well on the social policy impact-oriented indicators, in particular the risk of poverty or social exclusion among the elderly and on the constancy of consumption expenditure at the age limit of 60. These “good” results for the impact-oriented indicators are also remarkable against the background of only a medium current benefit ratio and provide an indication of the importance of supplementary funded systems.

Figure 73: Country comparison for the adequacy criterion – Leading countries plus Latvia



A third specification among the leading countries can be found in the example of the Netherlands. In fact, the Netherlands achieves favourable scores in all indicators. The only exception is the current benefit ratio. However, in the scoring system for the adequacy criterion it is highlighted

that there are no further reductions in the benefit ratio yet adopted. This strengthens the adequacy of the Dutch public pension system in the future, in contrast to Poland, Austria or Germany, for example. Serious reductions in benefit ratios are already institutionalised in these countries. And: Since the occupational 2nd tier is completely funded, the Netherlands has a strongly developed funded pension system, so that the disadvantages of a below-average current benefit ratio can be compensated for in terms of adequacy.

Latvia shows the weakest overall performance and thus also the greatest potential for catching up in terms of equity. With the exception of funded pension benefits, Latvia has the greatest catching-up potential of all the countries compared, in almost all of the sub-indicators.

2.14.2. Sustainability

According to the sustainability definition, sustainable systems must be financially sound and can be maintained over a foreseeable horizon under a broad set of reasonable assumptions. The functioning, and therefore the legitimacy, of pension systems rests on the trust that pension systems are able and trustworthy to maintain wealth and consumption capacity in old age.

Sustainability risks affect funded and PAYG systems in different ways. While aging is putting pressure on PAYG systems, market risks must be considered with regard to funded systems. These market risks also are considered in the robustness criterion beneath. Therefore, sustainability must be analysed separately for funded and PAYG systems. Independent from evaluation, pension schemes, funded or not funded, must be viewed in holistically. This is due to the modular or integrated characteristic of pension systems, which are mostly composed by a mix of components with different institutional features. For example: The benefit ratio for public pensions in Sweden might be significantly lower than in Austria, with 36% compared 54% in 2019, according to the EU Ageing Report (EU, 2021). However, this is not an indication for an overall “weaker” pension system, because private occupational and private individual schemes are much more important in Sweden. A useful indicator for the sustainability of private DB schemes can be the funding ratio. Here again, a smaller funding ratio does not per se indicate a less sustainable overall pension scheme, because most countries have implemented mechanisms to ensure the sustainability of DB plans and guarantee the benefits promised to members to some extent. Exemplary, some countries have a pension protection fund that can take over the liabilities of a DB plan.

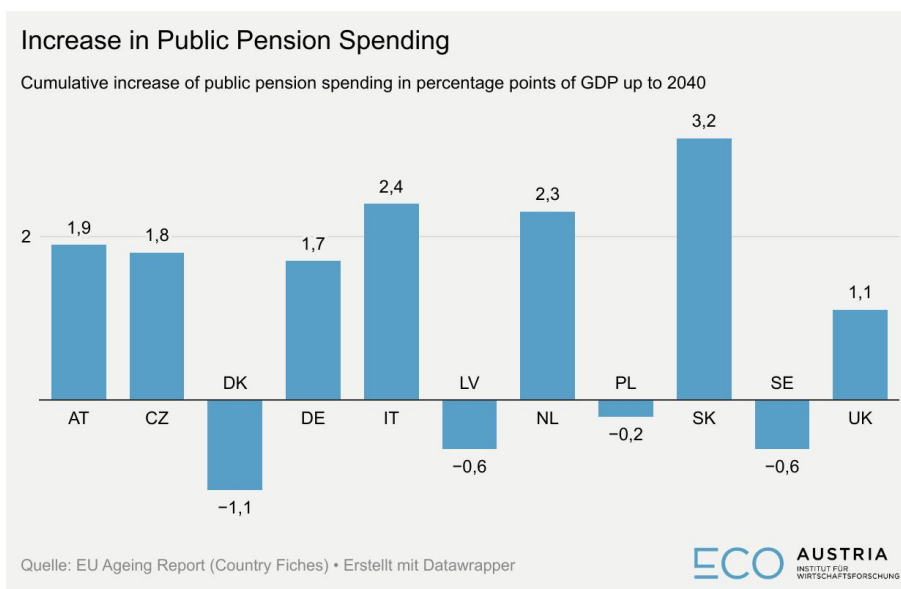
Fiscal pressure on public pension scheme financing

For public PAYG systems sustainability can be analyzed based on fiscal pressures arising from ageing societies. This is, within the country comparison here, one of the most common and most relevant indicators for evaluating the sustainability criterion for public schemes. A first indicator used is the funding pressure that will be placed on the financing of public pension systems in the medium term. The higher the funding pressure, measured in terms of the increase in public pension expenditure, the worse a country is rated in terms of the sustainability of its public pension system. The data basis is the cost projections of the EU Ageing Report. The cumulative change in public spending on state pensions as a percentage of GDP is considered, i.e., the results in

Figure 74 show the cumulative change in public spending on state pensions in percentage points of GDP.

Within the scope of the Ageing Report, the increase in public pension spending is decomposed into the main driving factors. The dependency ratio effect quantifies the impact of demographic changes on public pension expenditure. A higher dependency ratio effect indicates greater fiscal pressure due to ageing societies. As shown in Figure 74 all countries observed face increasing dependency ratios. The countries with the largest increases are Italy (8.3 points) and Austria (7.0 points), followed by Slovakia and Poland. The increase in expenditure is at least partly offset by other factors. Most of the EU Member States implemented pension reforms to compensate for the demographic pressure on public pension spending. For most of the countries, the decline in benefit ratios is one of the main adjustment mechanisms to compensate for rising pension expenditures. This is the case for Latvia and Poland, with declining benefit ratios of -2,7 and -3,4 respectively by 2040 but also for Austria with a cumulative benefit ratio effect of -2. Falling benefit ratios, however, signal a decline in the generosity of public pension systems. This might strengthen the sustainability of public pensions but however puts pressure on other quality criteria of pension systems, first and foremost the adequacy of pensions as being considered above. Even against the offset of the influencing factors, public pension expenditure is expected to increase for most of the countries under consideration.

Figure 74: Fiscal pressure on public pension spending, cumulative increase of public pension spending in percentage points of GDP up to 2040



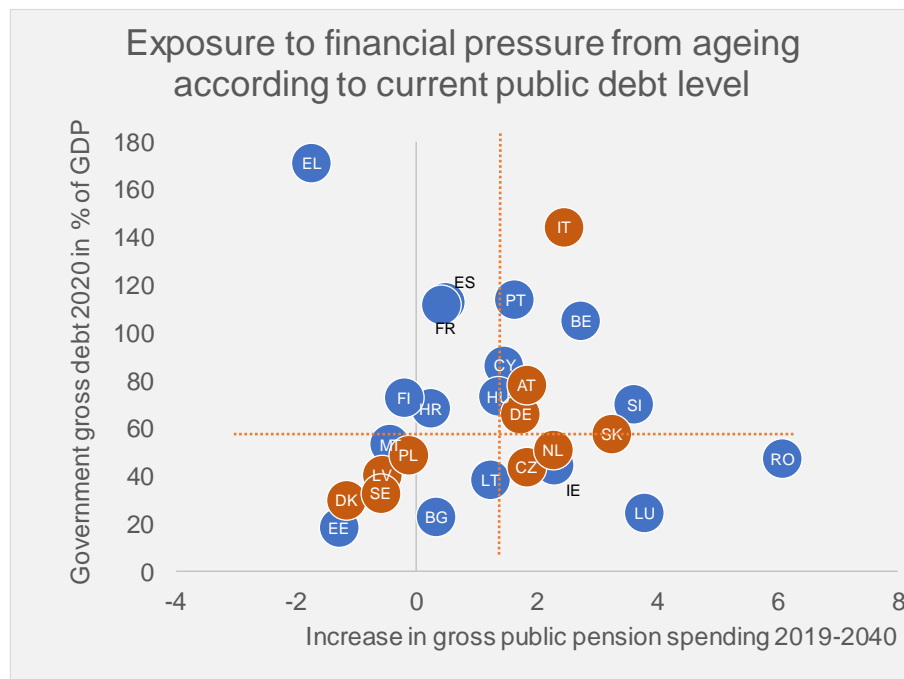
The observed countries show some variation in terms of increasing public pension expenditure projected up to 2040. While some countries even face a decrease in public spending, most of the countries face increasing pension spending. This applies particularly to Slovakia, with a cumulative increase of 3.2 percentage points by 2040, but also to Italy (2.4 percentage points) and the Netherlands (2.3 percentage points). As mentioned, some countries, Denmark, Latvia, Poland, and Sweden, on the other hand, even show declining public spending on state pensions.

For the index calculation it must be kept in mind that decreasing public spending for the countries mentioned is not treated as an indication for more sustainability. The sustainability condition is set to an increase of zero. All countries with decreasing expenditure are treated as “good” in terms of sustainability, equalling an index score of 1. A more negative difference is not considered a stronger indication for sustainability. This means that Denmark does not perform better than Poland, as both countries face declining pension spending, although the decline is more pronounced in Denmark than in Poland. Both countries are thus assessed with an index score of 1 in the later index calculation.

Public debt ratio

It is not only the increase in public pension expenditure that is relevant. Increasing expenditure must be seen in context of the overall budgetary position that have to finance rising public pension expenditures. The soundness of government accounts sets a foundation for financing the spending pressure proposed stemming from ageing societies. However, there is considerable variation in the initial level of government debt across the countries observed. Public debt should therefore be seen as an important contextual criterion for sustainability. Countries with a lower public debt ratio will be more likely be able to finance the financial pressures. Figure 75 shows the projected increase in government spending under consideration of the current level of government debt in relation to GDP on the vertical axis. The orange lines indicate the median value for the respective indicator. Countries that deviate upward to the right from both median values have a higher sustainability risk, as they have both above-average projected expenditure growth and above-average current government debt. The countries shown in orange are part of our country comparison.

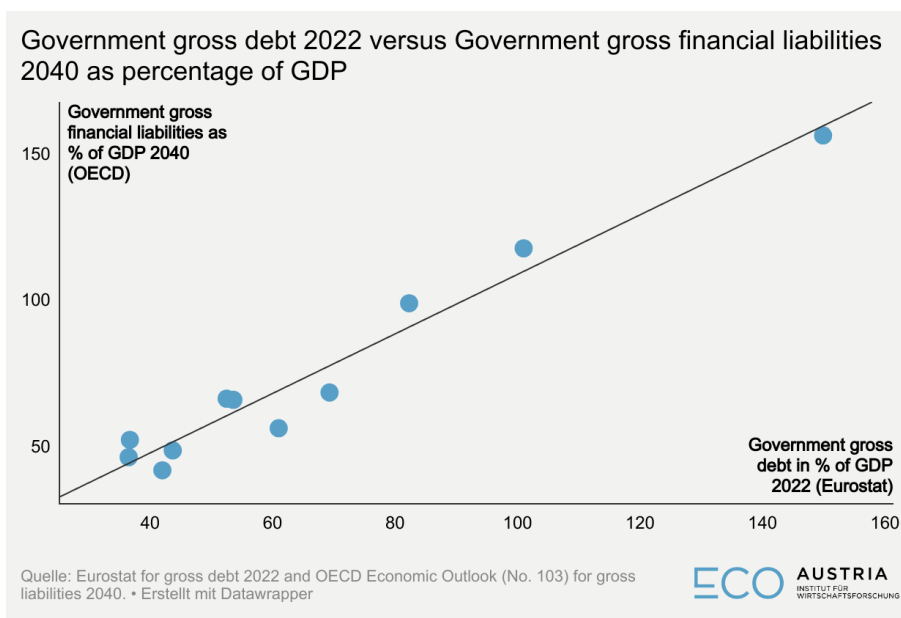
Figure 75: Comparison of pension spending increases up to 2040 versus current government debt in 2022



For example: As shown in Figure 74, the Netherlands has one of the highest expected financial burdens on public pension spending among the set of comparative countries, at 2.3 percentage points of GDP cumulatively by 2040. At the same time, the gross government debt in percent of GDP for the Netherlands in 2022 is 51%. Compared with other countries, this corresponds to a rather moderate or at least medium government debt level, compared to Germany with 66.3%, Austria with 78.4% or Italy with even 144.4%. For the Netherlands, it must be considered that, although a substantial increase in public pension expenditure is to be expected, the public sector's budgetary position shows a medium level of public debt and the increase in public pension expenditure might be considered affordable.

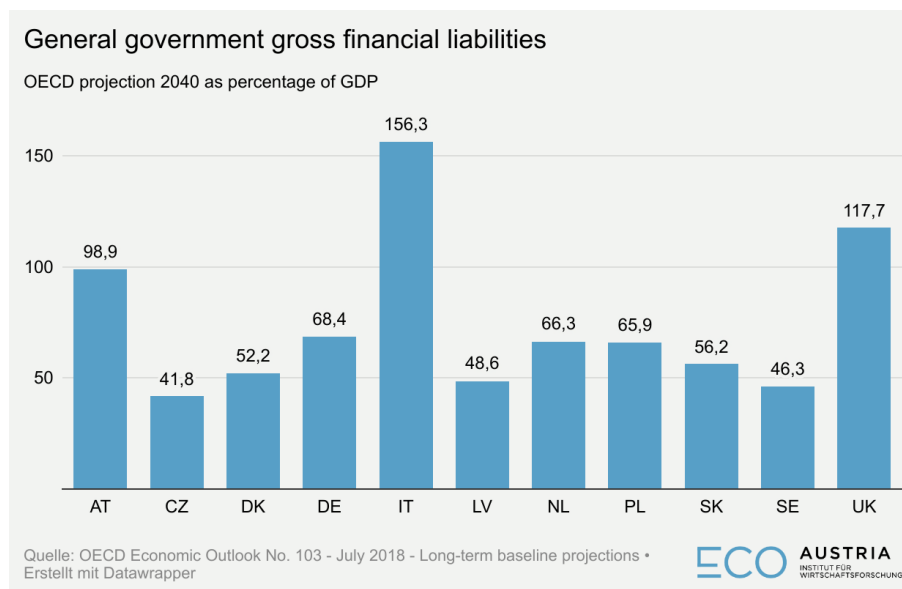
The public sector's cumulative debt is a relevant condition for financing the projected fiscal pressure of aging on public pension spending. Two indicator formats are relevant for the assessment. The government debt ratio in 2022 according to Eurostat and the projection of general government gross liabilities in 2040 according to the OECD's long-term economic outlook. Figure 29 shows an almost perfect correlation for these two variables. For the index assessment it is therefore irrelevant which of the two indicators is used. However, in terms of consistency, the OECD indicator is used to consider rising expenditures for government pensions in 2040. It shows government gross financial liabilities in percent of GDP in 2040 (Figure 77).

Figure 76: Correlation between government gross debt 2022 versus government gross financial liabilities 2040



As indicated in Figure 77, there are large differences in terms of expected debt in 2040. While some countries such as the Czech Republic (41.8%), Latvia (48.6%) or Sweden (46.3%) have a more manageable debt level, other countries will have significantly higher debt. Italy stands out with a value of 156.3% of GDP. The UK and Austria are also among the countries with high public debt. Accordingly, these countries are expected to have less fiscal scope to cope with fiscal pressures and other financial challenges posed by aging.

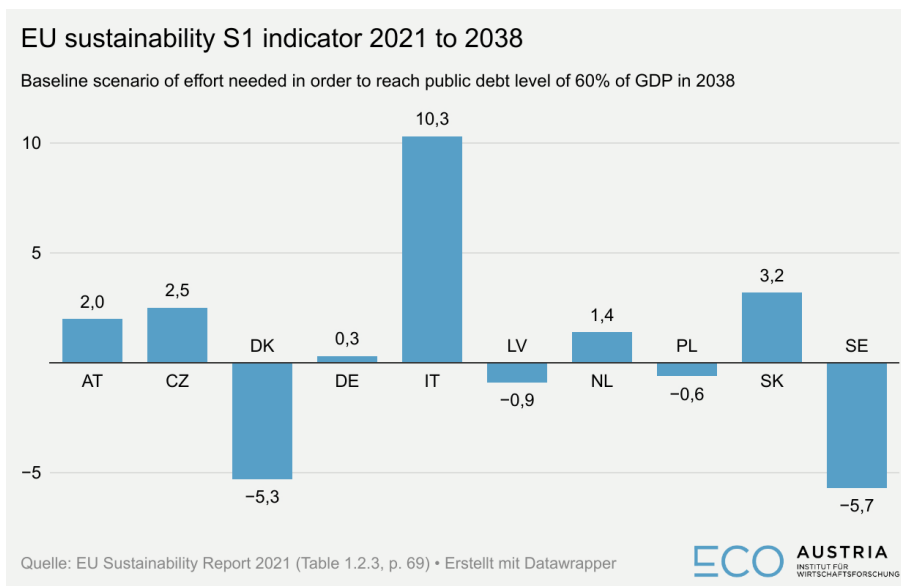
Figure 77: Government liabilities in percent of GDP in 2040



S1 Sustainability Gap Indicator

The European Commission developed sustainability indicators for public finances (DG ECFIN 2022). The so-called S1 indicator provides information on medium term fiscal challenges by considering the consolidation effort that would be needed to reduce debt to 60% of GDP in 15 years' time. This effort, as measured by the improvement in the public sector's primary balance compared to the yet institutionalised baseline. The target assumed for the calculation is a debt ratio of 60% in 2038. The S1 considers both, the financial burden of initial public debt levels and increasing costs of ageing.

Figure 78: EU sustainability S1 indicator 2021 to 2038



The countries differ in terms of the midterm sustainability of their budgetary position. While some countries have built up future fiscal leeway, as they show negative values for the S1 indicator, Italy stands out with a value of more than 10. The best performers are Sweden and Denmark with negative values of 5.7 and 5.3 respectively. Latvia and Poland also have negative S1 values. For the index calculation, it should be noted that a technical minimum of 0 is used as a technical minimum benchmark, rather than the actual minimum value of -5.7 for Sweden. This approach follows the consideration described above regarding public pension expenditure by 2040. Here again, an additional negative deviation from 0 is not considered an additional “advantage”. The target condition for the criterion is 0. An additional fiscal leeway in form of a negative S1 indicator could be relevant to the discussion in qualitative terms but does not set the benchmark for the criterion of fiscal sustainability. All countries with negative S1 values are therefore automatically assigned the best value of 1 in the index calculation. All other countries that show sustainability gaps are benchmarked to the technical minimum of 0.

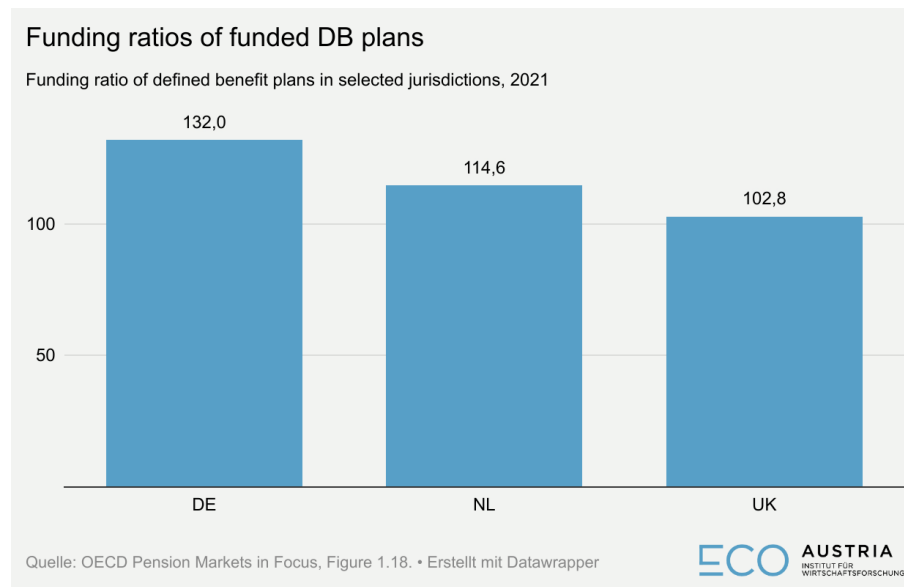
Funding ratio for private and funded pension plans

Also funded pension schemes are not completely free from sustainability risks stemming from market risks. The sustainability of funded DB pensions can be assessed based on funding ratios. These indicate the amount of liabilities to total assets and show whether pension entitlements are covered by assets. OECD’s Pension Markets in Focus (2023) shows the funding ratio regarding DB defined benefit plans. When the value of assets in DB plans is less than the value of liabilities arising from the retirement income promise, or in other words, when the funding ratio is below 100%, the plan is underfunded.

Information is not available for all countries. This is only the case for three countries in our comparison, namely Germany, the UK and the Netherlands. This number is too small for country comparison purposes, but the OECD information is used as reference values for other sources. As regards the comparison, given by OECD’s publication, DB plans in Germany have the highest

positive funding ratio, their counterparts in the UK are at 100% and Dutch DB pension providers rank in the middle of the two countries mentioned.

Figure 79: Funding ratios of funded DB plans, 2021



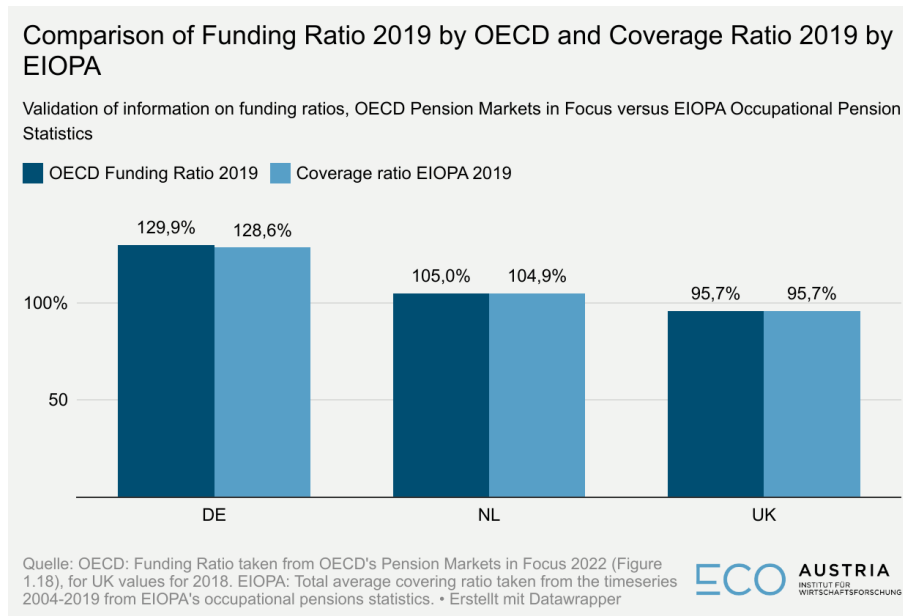
Information on funding ratios is provided within the scope of EIOPA's Occupational Pensions Statistics. EIOPA is the European Insurance and Occupational Pensions Authority. Data are provided for Institutions for Occupational Retirement Provision (IORPs).⁸² Data are from the institutions' balance sheets and refer to the last year of the 2004 to 2019 time series provided by EIOPA.

The information reported covers institutions for occupational retirement provision (IORP) and the equivalent business of life insurances affected by Article 4 of the relevant EU-directive 2016/2341. IORP are subject to reporting requirements set out in EU law and national law. These obligations are executed by the countries' national authorities, so-called NCAs for national competent authorities, for example the countries' National Bank Institutes. Authorities publish data for their national markets based on their reporting framework. The occupational pension statistics, published by EIOPA partially differs from national information in methodology, scope, and source. As a result, the funding ratio calculated from EIOPA statistics is not necessarily identical to national funding ratios. However, and this is relevant here, EIOPA publishes data on a fully consistent basis across all countries in the sample. EIOPA's Occupational Pension Statistics is covering the IORPs that are affected from national reporting obligations. However, some smaller IORPs might be exempted from reporting obligations, but still report balance sheet information.⁸³ The data information from exempted IORPs is considered by EIOPA.

⁸² Data is provided via the EIOPA website under the [Weblink](#) to EIOPA's occupational pension statistics.

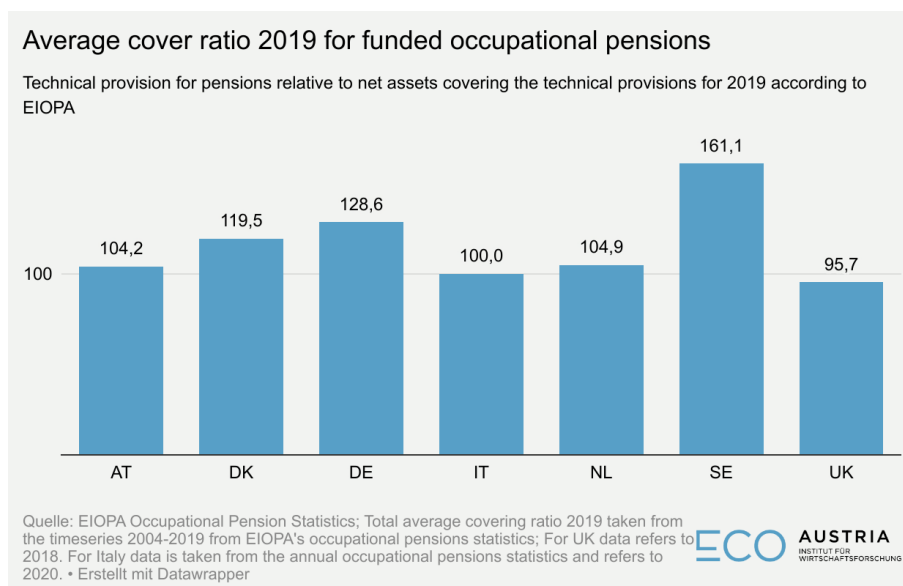
⁸³ NCAs are allowed to exclude the smallest IORPs from reporting assets, if at least 80% (75% until 2022) of the sector, in terms of balance sheet total, is covered by the full set of annual reporting. In addition, NCAs may exempt the smallest IORPs in the corresponding Member States from the full set of reporting, if the total assets are less than EUR 25 million or the number of its members including beneficiaries is fewer than 100, until 20% (25% until 2022) of the sector, in terms of balance sheet total, is reached.

Figure 80: Validation of funding ratio information from OECD and EIOPA



The following analysis targets the average coverage ratios reported in the time series of EIOPA occupational pension statistics. For the United Kingdom, the latest available information for 2018 is used. The cover ratio is built from net assets covering the technical provisions for pension entitlements relative to technical provisions for pensions. For Italy data is taken from the current balance sheet information, published via the EIOPA website.

Figure 81: Cover ratio for funded occupational pensions for 2019 according to EIOPA



There are major differences between the countries observed in terms of the funding ratio. IORPs in Sweden have the highest funding ratio, at over 160, while Germany (128.6) and Denmark (119.5) also have higher funding ratios for occupational pension entitlements. Occupational

pension institutions in the United Kingdom have the lowest funding ratio, with a funding ratio of around 96, and in Italy, with 100.

Coverage of funded and private pension plans

The following consideration for the coverage in funded pension assumes that funded pension schemes are less affected from financing pressures resulting from ageing societies. This does not mean that funded pension schemes are completely free from ageing risks. A positive rate of return on an investment is a fundamental criterion, thus also funded pension plans are built on the assumption of a sound economy, productivity growth and prosperous competitive economy. Nevertheless, funded systems are less vulnerable to systemic risks of aging because the financing of current benefits as well as the benefits of the future retirees is based on the capital stock that accrues in pension accounts. A high level of coverage, i.e., a high degree of inclusion of individuals in funded schemes, in whatever form, can thus be seen as a lever for sustainability over the overall pension system.

In this context, the classification of PAYG or funded systems as good or bad is not the objective of the analysis. However, the financing pressure of ageing societies must be seen as a systemic risk for pension systems. This calls into question the sustainability of the overall system. In any case, an integrated system that includes different financing components, such as PAYG in combination with capital funding, can be seen as advantageous, if the aspect of risk diversification is taken into account. Against this background, the highest possible coverage of the working-age population in funded pension plans can also be seen as a quality criterion for the entire pension system.

In its publication *Pension Markets in Focus OECD (2023)* examines the share of the working-age population participating in funded schemes. In doing so, the system-related differences between the countries must be taken into account. Some of the countries under review have mandatory or, as in the Netherlands, quasi-mandatory funded occupational schemes. In countries with mandatory occupational plans employers and those affected by a certain industrial agreement are obliged to organize a pension plan for their employees. In Denmark, the Netherlands and Sweden the legislation does not formally require employers to set up a plan for their employees, but participation in a plan in these countries is quasi-mandatory as the decision is made at the industry or branch level through collective or industrial bargaining agreements. Some countries do not require employers to set up a plan but require employees to join a private pension fund or a state funded pension plan, as it is the case for Denmark. Some countries provide for automatic enrolment plans. Finally, some countries have voluntary occupational and/or voluntary individual plans.

Often, different systems can be found side by side, such as in Denmark. In these countries individuals may participate in several different types of plans simultaneously. They may have to participate in a mandatory plan accessed through their work and may also contribute voluntarily to a pension plan that they open voluntarily. In some countries, they could be members of several voluntary plans, contributing to the occupational plan of their current employer while retaining rights in the plans of their former employers.

In the publication Pension Markets in Focus the OECD (2023) shows the coverage, i.e., the proportion of the working-age population covered by the various schemes. As for some countries several non-exclusionary systems exist in parallel, Figure 81 also shows the maximum coverage in different systems.

Table 37: Coverage of funded pension plans as percentage of the working-age population

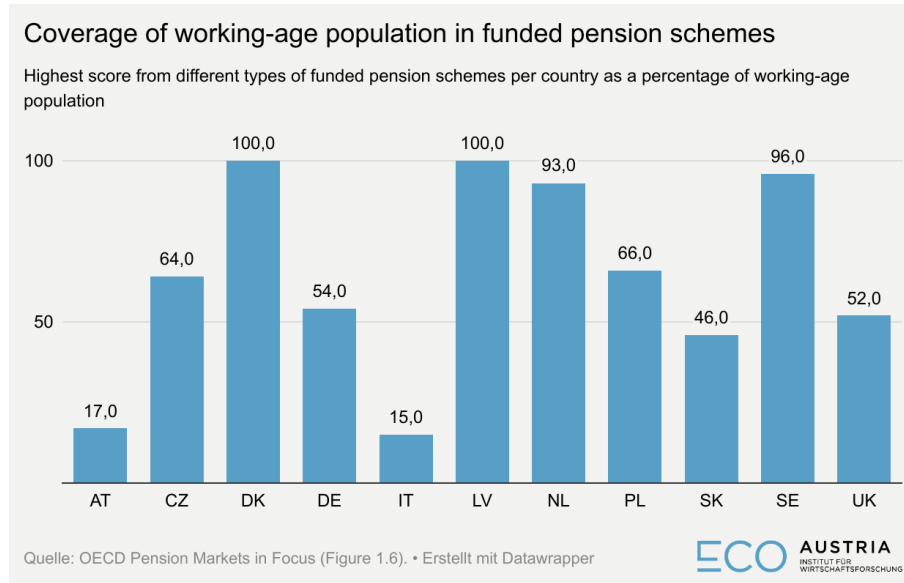
Coverage of funded pension plans as percentage of working-age population						
	Mandatory or quasi-mandatory	Voluntary occupational	Auto-enrolment	Voluntary personal	Voluntary occupational and/or personal	Highest Score of coverage
AT		15,2		16,5		16,5
CZ				63,7		63,7
DK	100,0			17,1		100,0
DE		54,0		30,0		54,0
IT		11,5		14,6		14,6
LV	100,0	1,1		24,1		100,0
NL	93,0					93,0
PL			11,0	65,7		65,7
SK				46,3		46,3
SE	96,4					96,4
UK			52,0	5,0		52,0

Quelle: OECD Pension Markets in Focus (Figure 1.6) • Erstellt mit Datawrapper

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High coverage in funded schemes is here used as an index criterion for sustainability. This is done with the understanding that systems that have a high degree of inclusion have also a higher diversification against the systemic risk of aging. Figure 82 shows large differences in the degree of coverage. Denmark and Latvia with 100% achieve the highest values in the field of mandatory occupational plans. According to Pension Markets in Focus (OECD, 2023) employees in Denmark are required to participate in a state funded pension plan. In Latvia the working-age population is completely covered by mandatory funded NDC plans, according to Pension Markets in Focus. The countries with the lowest coverage are Italy (15%) and Austria (17%). These are countries where PAYG dominates the financing of the second occupational pillar.

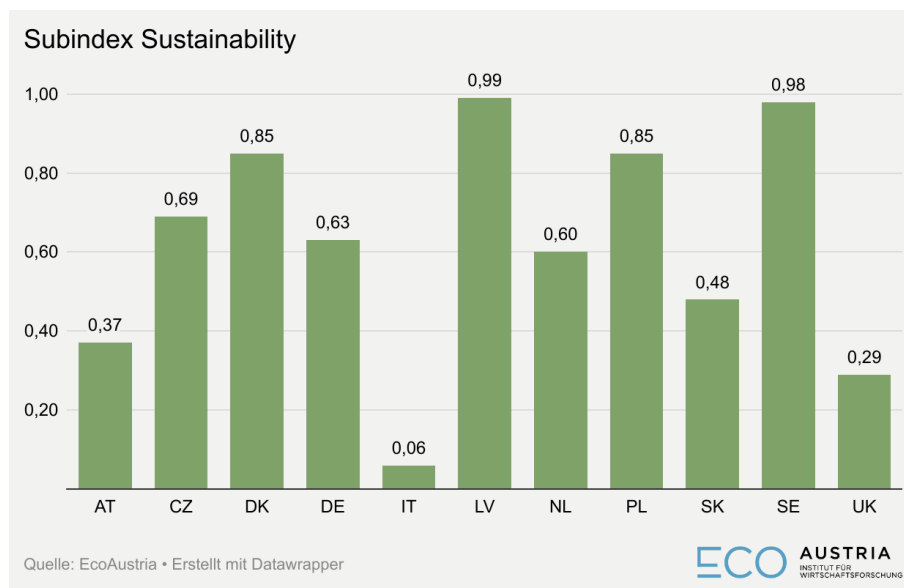
Figure 82: Coverage of funded pension plans as percentage of the working-age population



Synthesis Sustainability

The indicators described are included in the subindex of the sustainability criterion. Five indicators are considered: 1) increase public spending 2040, 2) public debt 2040, 3) funding ratio, 4) coverage of funded pension and 5) the results for the EU Commission's S1 sustainability indicator. With an index value of 0.99 and 0.98 respectively, Sweden and Latvia have the highest values for all indicators and are close to the highest possible value of 1.

Figure 83: Synthesis Subindex Sustainability



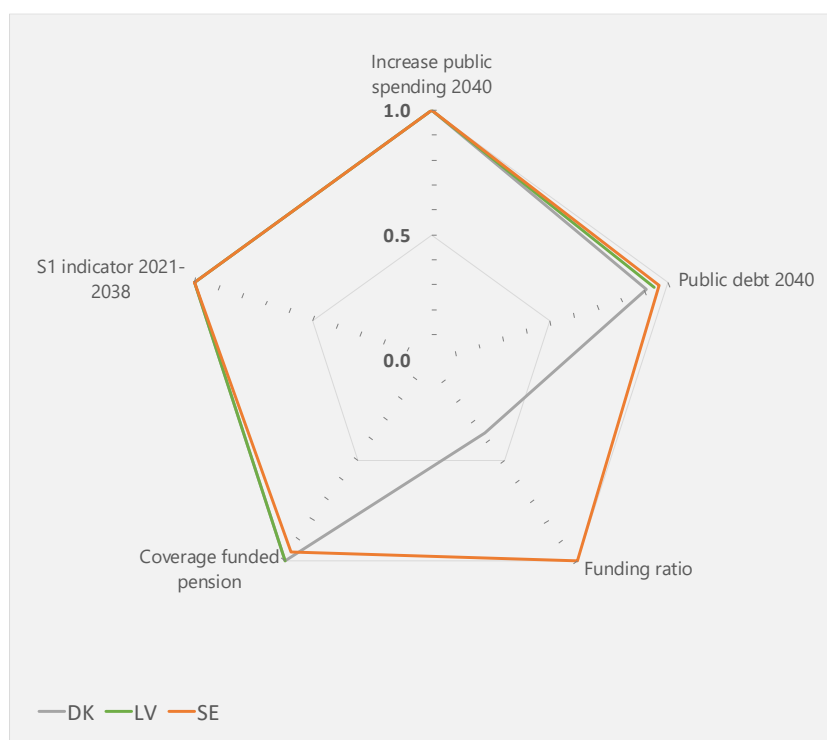
Sweden is among the top performers in all individual indicators. Latvia also is among the top performers for all indicators, with an index value of 0.99, the same as Sweden. However, for Latvia data on funding ratios is missing. A low funding ratio for Latvia would worsen the country's good position in the sustainability ranking. However, from OECD and EIOPA data there is almost no

indication that funded pension plans in Latvia would in any kind be underfunded. Thus, the results for Latvia seem reliable despite missing values for funding ratios. To a certain extent, Latvia's good position comes as a surprise, as the country was ranked last in terms of the adequacy criterion. As a result, Latvia's pension system is not very generous, but at least it is sustainable and stable.

In a way, the opposite counterpart to Latvia is Italy. Italy was ranked top in terms of adequacy, i.e., it has a thoroughly generous and thus “adequate” pension system (Figure 72). At the same time, however, Italy shows weaknesses in terms of sustainability. Similarly, Austria, with an index value of only 0.26, the UK (0.36) and the Slovak Republic (0.42) also have the potential to catch up in terms of sustainability, although not to the same extent as Italy.

As shown in Figure 73 the three leading countries are almost head to head in all single indicators, despite Denmark's medium, but still at about 120% distinctively positive, position with regard to pensions' funding ratios. For Latvia, as mentioned, data on funding ratios are missing. Apart from this, the three leading countries are almost running in parallel lines (Figure 84).

Figure 84: Country comparison for the sustainability criterion – Leading countries plus Latvia



2.14.3. Affordability

The next criterion considered is affordability. The underlying definition focuses on the financing capacity of the respective financing mechanisms. Affordability is achieved by ensuring the financing capacity of all underlying financing mechanisms, be they individual, social, or public. The criterion applies to systems regardless of the design of certain elements and their

constitution, for example as publicly or privately funded systems. Affordable systems should not crowd out other needs or have undesirable financial consequences.

Mandatory contribution rates for average worker

A first indicator for the assessment of the affordability criterion is the effective contribution rate for mandatory old-age and survivor pensions on average earnings. Values are taken from OECD's Pension at a Glance (2023, Table 8.1). Contribution rates are calculated from the nominal contribution rates and refer to gross earnings of average earnings.

For some countries nominal and effective contribution differ from each other since the relevant corresponding rate depend on the individual wage. This is the case for Netherlands or for Sweden. Furthermore, we must keep in mind that contribution rates within the scope of funded occupational pensions might depend on the underlying pension plans. In the Netherlands, for instance, occupational pension plans are regulated by collective agreements. These pension plans vary in terms of contribution rates. Furthermore, occupational pension contributions are only paid for earning above the so-called "AOW-franchise", corresponding to the wage minus the contribution for the first pillar public ("AOW") pension. According to OECD (2021, p. 197), the total nominal contribution rate in the Netherlands depends on wage brackets and equal 18% below 39% of average earnings, 40.5% between 39% and 66% of average earnings and 22.5% above this level.

Figure 85: Effective contribution rate on average earnings 2020



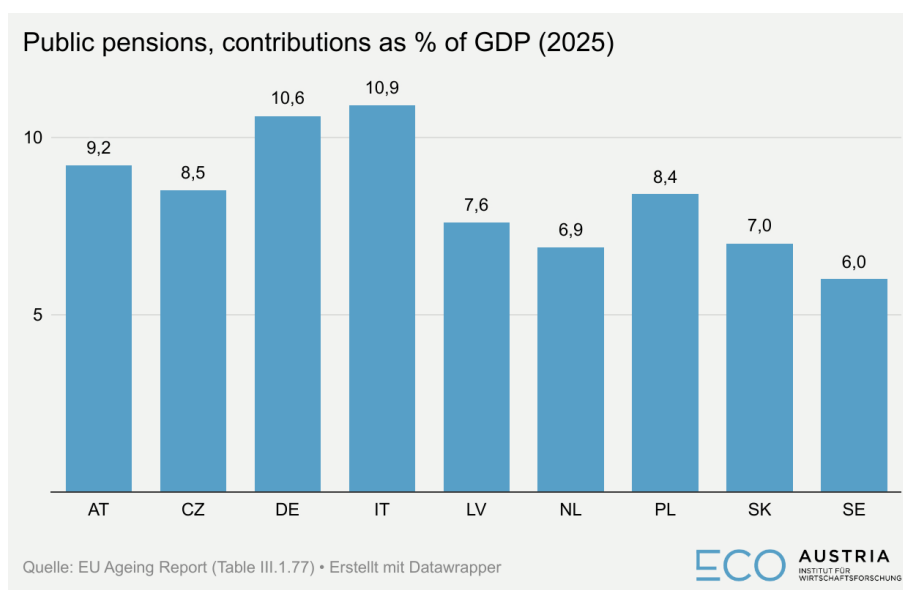
Regarding mandatory systems for old-age and survivor pensions, there are considerable differences between the countries reviewed. The effective contribution rates vary from about 13% in Denmark up to 33% in Italy. However, one must be aware of the institutional design of pension systems. Contribution rates to public pensions and survivors' pensions are higher in Italy, where mandatory public pensions play a more important role than, for example, in Denmark, where the emphasis is on mandatory or quasi-mandatory funded occupational pensions. The consideration

of contribution rates for public pensions may only be valid and reliable in the context of other indicators use to assess the affordability criterion.

Total contributions for public pensions

Contribution rates, as shown above, do not reflect the total amount of contributory payments in an economy. The Ageing Report (EU, 2021, annex table III.1.77) provides information on total paid contributions required to build up entitlements for public pensions. According to the Ageing Report, contributions to pension schemes paid by employers, employees and self-employed persons are considered (Figure 86). Within our country comparison, the values refer to 2025 contribution spending levels relative to GDP. State contributions, i.e., specific tax revenues allocated to the pension system, are only considered when transfers are rooted in legislation. This is not the case, for example, with the so-called “*Bundesbeitrag*” in Austria. This payment corresponds to a stabilising compensation mechanism to cover deficits in pension spending. It is financed by general taxation, but not included in total contribution payments. In 2019, this “*Bundesbeitrag*” amounted to EUR 8.6 billion (2.16% of GDP). Revenues from other sources, e.g., assets from private schemes being transferred to the public scheme, are included into the total amount of contribution payments.

Figure 86: Contributions for public pensions as percentage of GDP in 2025



The countries under review show a high variance regarding the total amount of contributions relative to GDP. The values range from 6% in Sweden and 6.9% of GDP in the Netherlands to 10.9% in Italy and 10.6% in Germany respectively.

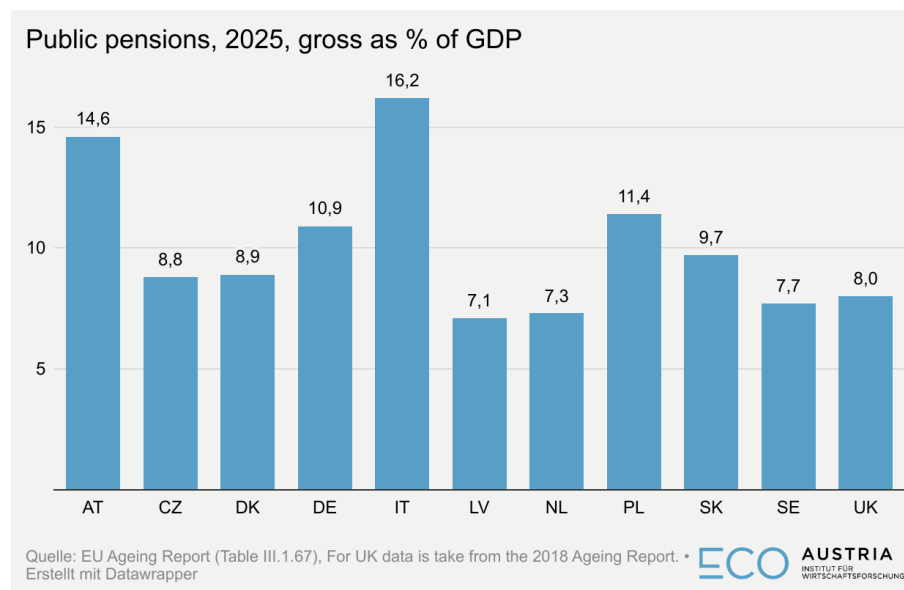
Current public pension expenditure

The level of contributions does not give a fully valid indication of the macroeconomic financing of the statutory pension scheme. As mentioned, state contributions, i.e., specific tax revenues allocated to the pension system, are taken into account in Figure 86 only when transfers are rooted in legislation. Some compensation mechanisms are not considered, when these financing

mechanisms are not laid down by law. The contribution of 9.2% of GDP for Austria in Figure 86 includes revenue from legislated contributions either by the employers or the employees or by the state and public authorities but underestimates the total financing of public pensions in Austria.

In the following the complete current public expenditure is taken into consideration. Data is taken from the 2021 Ageing Report (EU, 2021) and refer to expenditure levels in 2025. For the UK data is taken from the 2018 Ageing Report, but also refer the year 2025.

Figure 87: Gross public pension expenditure in 2025 as percentage of GDP



The 11 countries reviewed show differences in terms of total large public pension expenditure. The countries range from 7.1% in Latvia and 7.3% of GDP in the Netherlands to 14.8% in Austria and even 16.2% in Italy.

Contributions to funded pensions to GDP

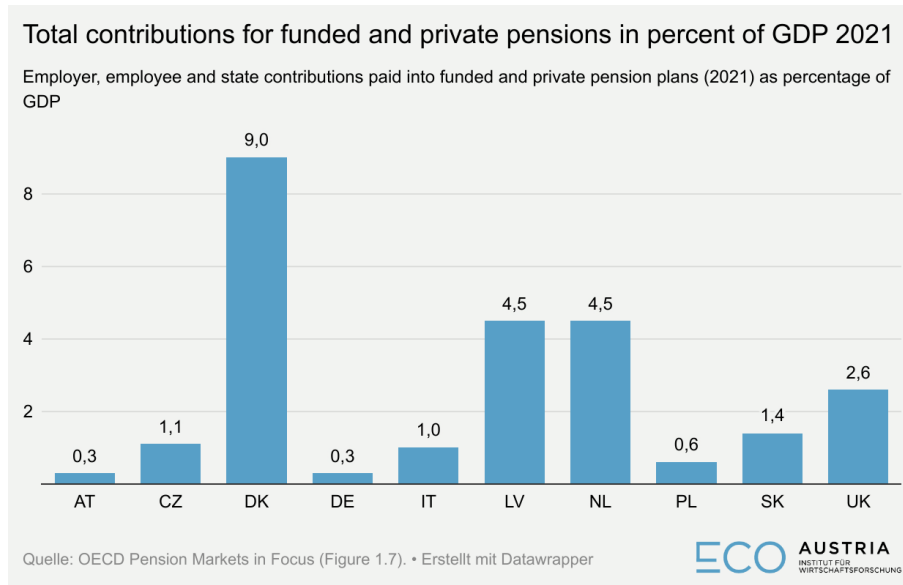
In Figure 86 contributions to public pensions as percentage of GDP are considered. However, it should be borne in mind that the pension systems of some countries, such as the Netherlands or the UK, which show very low and therefore affordable contribution levels in the analysis of Figure 86, often have a stronger focus on funded schemes, for example occupational schemes. For a valid overall assessment, the volume of funded pensions must also be considered in order to arrive at a meaningful assessment of affordability.

In the following, we analyse contributions to funded pensions according to OECD's Pension Markets in Focus (OECD 2023, Figure 1.7, p. 19). The values refer to the year 2021 and include contributions from employers, employees and from public or government sources. The total sum of contributions to funded and private pension plans is regarded as a corresponding indicator to the contributions to public pension schemes, as shown in Figure 86 above.

There are considerable differences between the countries observed. As expected, the volume of contributions to funded and private pensions is high in countries that rely more on funded private or occupational pensions. This applies, for example, to Denmark, Latvia and the Netherlands that

also have lower contributions to public pensions to GDP, as shown in Figure 86. In Denmark, total contributions for funded and private pensions amount to 9% of GDP, compared to 4.5% in the Netherlands and Latvia. At the other end of the scale are countries with a strong focus on public PAYG systems, notably Austria and Germany with a contribution volume of only 0.3%.

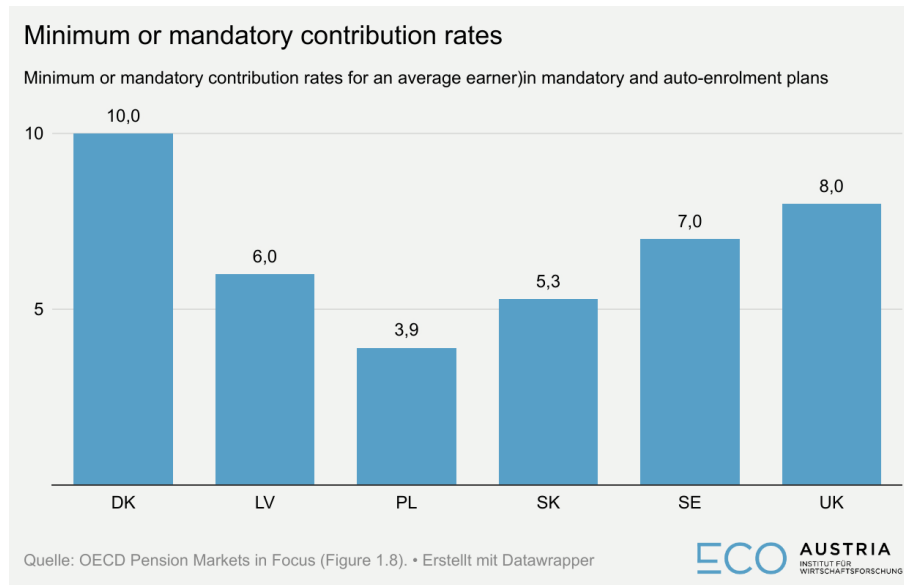
Figure 88: Contributions into funded and private pension plans 2021



Minimum contribution rate for funded mandatory pension plans

For six countries in our country sample, OECD provides information on minimum or on mandatory contribution rates. The results refer to average earners in mandatory and auto-enrolment funded pension plans. The data information is taken from OECD's Pension Markets in Focus publication (OECD, 2023, Figure 1.8, p. 20). The countries reviewed show significant differences in terms of contribution rates for average earnings. The mandatory or minimum contribution rates range from 3.9% in Poland up to 10% in Denmark. In the Slovak Republic, in Latvia and Sweden contribution rates are at an average level, ranging between 5.3% and 7%.

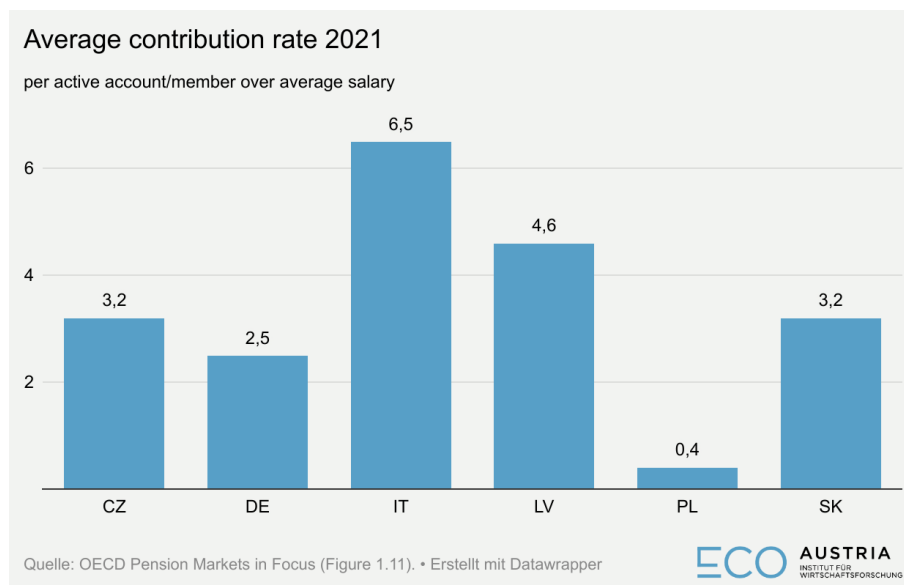
Figure 89: Minimum contribution rates in mandatory funded pension plans



Average annual contribution to funded pensions

For again six countries out of 11, OECD's Pension Markets in Focus comprises information on average contribution rates for private and funded pension plans (OECD 2023, Figure 1.11, p. 24). This observation completes the analysis in Figure 89 on minimum or mandatory contribution rates for private and funded pension plans. Contribution rates again refer to average workers' earnings. In Figure 90 shows the contributions paid per member, taking into account all sources, whether voluntary or mandatory. It becomes evident that the average contribution rates in 2021 vary considerably between the different countries. The average contribution rate for funded and private pension plans is highest in Italy with 6.5%. It is lowest in Poland with 0.4%.

Figure 90: Average contribution rate for private and funded pension plans 2021

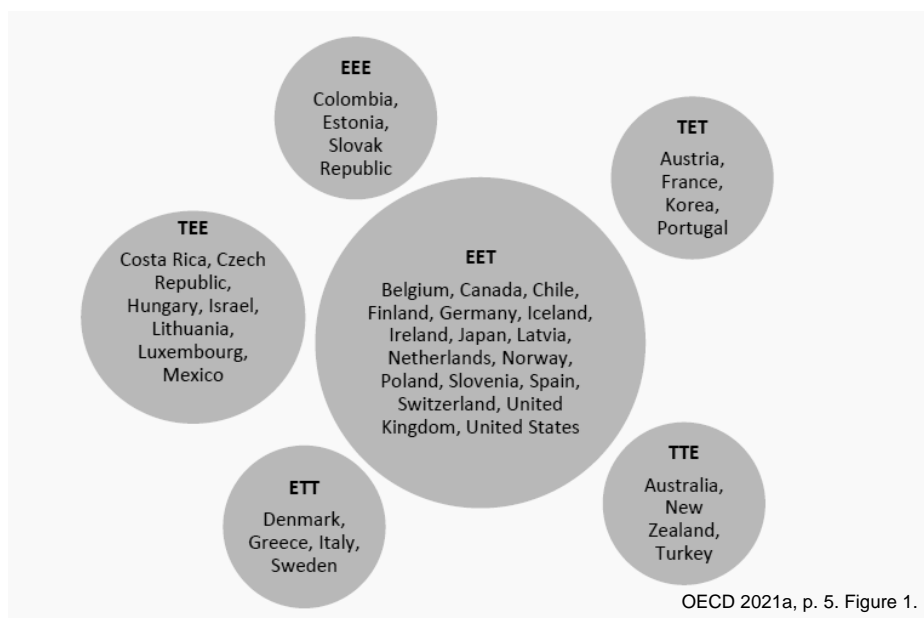


Incentives resulting from taxation regime

Taxation of private and funded pensions can be seen as one aspect of affordability. Countries' funded pension tax regimes intend to incentivise private pension spending by providing for tax exemptions. Conversely, more restrictive taxation of private and funded pensions may affect the affordability of private pension savings in the contribution phase and therefore are interpreted as a disincentive to private pension saving.

The country comparison regarding the tax regime is built up on OECD's 2021 publication on financial incentives for funded private pension plans (OECD 2021a). The basis for this comparison is a classification scheme developed by OECD and World Bank and introduced by Whitehouse (1999). Accordingly, there are three transactional stages that affect the taxation of funded pension saving, each of which provides an option for taxation: 1) the first stage, when money is contributed to a fund, normally by employers and employees or by an individual insurant, 2) the second stage, when investment income and capital gains accrue and 3) the third stage, when retirees receive benefits from funded pension plans. In the classification system, taxation or exemption is indicated by either a "T" for taxation or an "E" for exemption. The traditional form of taxation corresponds to a TTE system. Contributions are paid from after-tax earnings and are taxable as indicated by the "T" in the first position of the formula. The return on investment, i.e., the investment income generated by pension plans, is either taxed in the traditional TTE form, as indicated by the second 'T' in the code. Withdrawals from pensions as well as benefits paid from pension plans are here tax-free or exempted, which is signalled by the "E" in the third position in the code.

Figure 91: Classification of the main funded pension scheme provided by OECD



Special tax incentives for retirement savings arise when countries' pension tax regimes deviate from the traditional TTE form. Some countries have adopted a variant of the "Exempt-Exempt-Taxed" (EET) tax regime for retirement savings (OECD 2021a), where both contributions and investment returns are exempt from taxation, while benefits and withdrawals are treated as

taxable income. In our country comparison we find a wide range of tax regimes, from the “EEE” tax regime, where contributions, returns and pension income are tax exempt, to regimes where at least two of three stages are taxed. Since for the most countries observed more than one singular regime applies for the taxation of private pensions, the assessment relies on the OECD classification. Here the most important funded pension plan in each country is considered. This overview is derived directly from the OECD (2021a, p. 5; 2022b, p. 7) publications.

For the index calculation the following assessment applies. “T” is classified with an initial index-score of 1, “E” is classified with 0. A lower value indicates a less restrictive regime and thus a stronger incentive and, vice versa, a higher value signals a more restrictive taxation and thus a weaker incentive to participate in a funded pension scheme. For the calculation of the affordability subindex across all indicators, the values from the index presented here are inverted (Figure 93).

Weights are used for indexation purposes. As the first stage of contributions paid to a funded plan might be more a more relevant incentive for the decision to even start participating in a scheme – compared to the later second and third stage – the taxation of contributions at the first stage is weighted higher at 0.5. From an economic point of view, a tax exemption in the first contribution phase could provide a stronger incentive, as the marginal tax rate on earned income will generally be higher than that on pension benefits. The subsequent levels 2 and 3 are each weighted by 0.25. The indexation scheme for the assessment of incentives from taxation is presented in Table 38.

Table 38: Indexation scheme for the assessment of incentives/disincentives resulting from taxation

Indexation scheme for the assessment of incentives resulting from the taxation of funded pensions				
Scale: 0 = least restrictive and strongest incentive; 1 = most restrictive and weakest incentive				
	Contribution payments (P)	Capital growth (C)	Benefits from pensions (B)	Indexation (P*W+C*W+B*W)
WEIGHT (W)	0,50	0,25	0,25	1,00
EEE	0	0	0	0,00
TEE	1	0	0	0,50
TTE	1	1	0	0,75
TTT	1	1	1	1,00
ETE	0	1	0	0,25
ETT	0	1	1	0,50
EET	0	0	1	0,25
TET	1	0	1	0,75

Quelle: OECD (2021a and 2022b) and EcoAustria • Erstellt mit Datawrapper

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Our country comparison reveals differences in the extent of incentives deriving from taxation (Table 39). The countries with the strongest incentives from taxation are Slovakia, with an EEE system, followed by Poland, Latvia, Germany, the Netherlands and the UK, with all EET systems. Conversely, a more restrictive taxation scheme is indicated for Austria.

Table 39: Assessment index for incentives/disincentives resulting from taxation of funded pensions

Assessment of incentives resulting from taxation of funded pensions

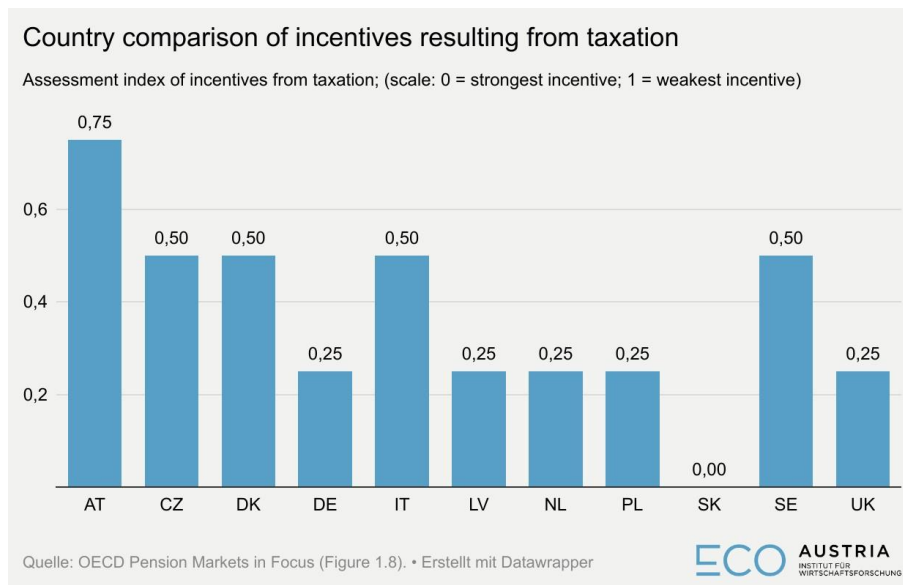
Lower index values indicate a stronger incentive to participate

	Tax treatment of main pension plan in country	Assessment index for incentives resulting from taxation
AT	TET	0,75
CZ	TEE	0,50
DK	ETT	0,50
DE	EET	0,25
IT	ETT	0,50
LV	EET	0,25
NL	EET	0,25
PL	EET	0,25
SK	EEE	0,00
SE	ETT	0,50
UK	EET	0,25

Quelle: EcoAustria, OECD 2021a and 2022b • Erstellt mit Datawrapper

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Figure 92: Country comparison of incentives/disincentives resulting from taxation



Synthesis Affordability

The results of the affordability subindex are summarized below. The subindex is made up of seven subindicators: 1) effective contribution rate referring to average earning, 2) contributions to public pensions as percentage of GDP 2025, 3) public pension expenditure 2025, 4) contributions to funded pensions as a percentage of GDP, 5) minimum contribution to funded pensions at average earnings, 6) average contribution to funded pensions at average earnings and 7) the assessment score for the tax regime's degree of restrictiveness. As regards the inclusion of the results from the assessment of incentives resulting from taxation (7), the values of the assessment index presented above had been inverted and scaled between 1 and 0. The most restrictive taxation

system with the weakest incentive from taxation is assigned a value of 0 and, conversely, the least restrictive system with the strongest incentive is assigned a value of 1.

Figure 93: Synthesis Subindex Affordability



As shown in the summary in Figure 93 the countries with the highest affordability scores are Poland, with a subindex score of 0.76, followed by the Slovak Republic (0.74), the Netherlands (0.67) and Sweden (0.66). The country with the least affordable overall pension system is Italy with a subindex score of 0.2.

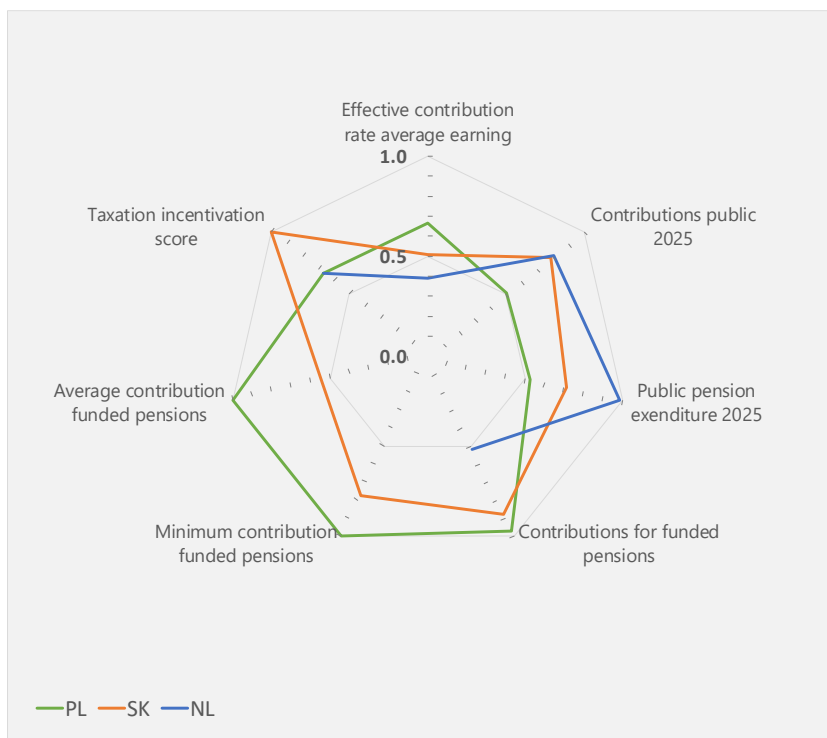
As can be seen in Figure 94, the strengths/weaknesses profiles of the leading countries Poland, Slovakia and the Netherlands are rather diverse. Poland reaches the best scores regarding contributions for funded pension plans. Poland has a very low volume of contributions to private pension plans relative to GDP, compared to the other countries observed. At the same time, the minimum contributions and average contributions relative to average workers' earnings are among the lowest in our country comparison.

The Slovak Republic reaches the best assessment regarding tax incentives. The OECD classifies Slovakia's tax regime as an EEE, which provides the strongest incentives. Furthermore, in the Slovak republic the contributions paid for funded pensions is among the lowest in our comparison. In terms of the assessment of affordability, this is treated in a positive manner, regardless the generosity reached in funded pension plans in Slovakia. However, the generosity of funded pensions is assessed within the scope of the adequacy criterion (Figure 68). Regarding benefits paid from funded and private pensions, Slovakia ranks only 10th among the 11 countries compared.

The third leading country in terms of affordability is the Netherlands. The Dutch pension system has low expenditure for public pensions. This is not surprising, as the Netherlands is one of the countries with a strong focus on funded occupational schemes. Apart from this, the Netherlands is average and by no means above average values in terms of total contributions to funded

pensions relative to GDP. When interpreting the results for the Netherlands, it should be however borne in mind that no comparative values were available for two indicators (Figure 94).

Figure 94: Country comparison for the affordability criterion – Leading countries



2.14.4. Equitability

According to the definition, provided by the World Bank authors “an equitable system provides income redistribution from the lifetime rich to lifetime poor consistent with societal preferences while not taxing workers or retirees external to the system” (World Bank, 2008, p. 4). The definition may be perceived somewhat unspecific. An even broader definition is used here since equitability is more than just redistribution from wealthier persons to the poor. In the understanding of this report, equitability aims at both social equality and equity. Equitability is achieved through a compromise of social redistribution and ensuring equivalency and symmetry of income across the transition from work to retirement. For example, equitability is achieved, when a defined benefit system provides an equivalent benefit across income groups and cohorts. Insofar, equitability, as being assessed here, does not only focus on the social equality aspect of redistribution, but also aims at “fairness” of treating contribution payments and periods within individual insurance records somewhat “equally”. Without getting philosophical, however, there is no universally and intersubjectively reliable definition of what people consider as being “fair”. In the definition used here, the equitability criterion aims at a compromise between different, but not necessarily opposing goals, for example aspects of social equality and equity as well. As mentioned, an equitable system might provide for income redistribution from the lifetime rich to the lifetime poor. At the same time, pension systems aim to smooth consumption over a lifetime, assuming that accumulated pension rights and entitlements are treated with some equivalence between

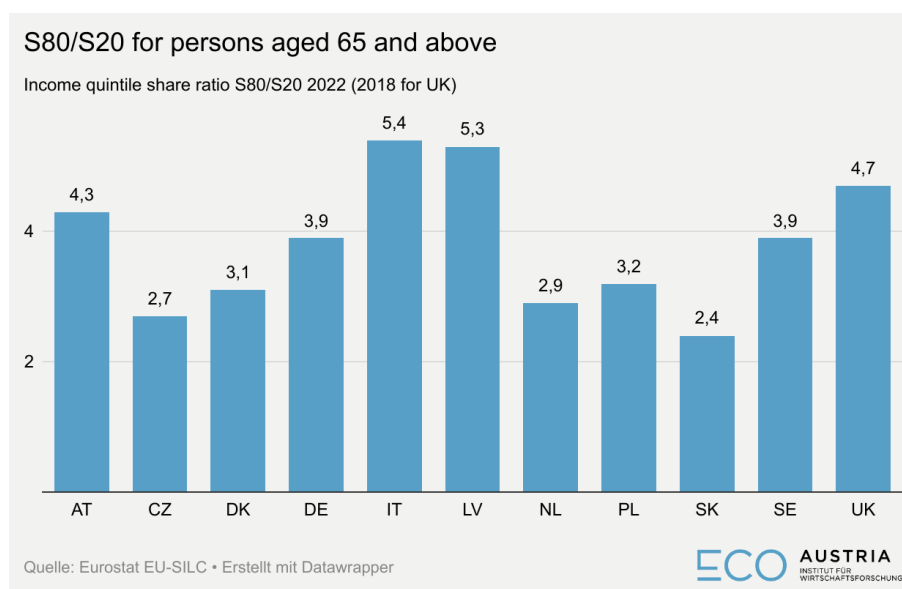
individual members. The latter might be for example achieved when there is almost no redistribution between participants in a scheme and all contributions and assessment periods are treated strictly equivalent. In this case, however, the first condition of redistribution from the lifetime rich to the lifetime poor may be questioned.

Following the definition, the assessment of the equitability criterion is performed in two steps, each based on the consideration of distribution measures. For this purpose, the S80/S20 indicator by Eurostat is used. This indicator measures the income quintile share of the wealthiest quintile to the lowest income. For example, a S80/S20 value of 2.5 means that the income of those 20% of the population having the highest incomes is 2.5 times higher than that of those 20% of the population with the lowest incomes. In accordance with the definition of the equitability criterion, two approaches are applied, leading to an "equitability within" and an "equitability across" perspective. Whereas the former considers an evenly income distribution "within" the age cohort of 65 years old and above, the latter focuses on an evenly distribution "across" the age break or age threshold of 65 years.

Equitability within

The first perspective applied to the S80/S20 indicator is the "equitability within" approach. It reflects the first redistributive aspect of equitability. From this perspective equitability is achieved when the system provides for income redistribution from the lifelong rich to the poor. A better overall system is therefore indicated by a smaller S80/S20 value for persons aged 65 and above (Figure 95).

Figure 95: Equitability within – Income quintile share S80/S20 of persons aged 65 and above



The countries under consideration show large differences in terms of the evenness of income distribution within the age group of persons aged 65 and above. For example, the S80/S20 indicator for Italy and Latvia shows a very high degree of inequality, with values of 5.4 and 5.3,

respectively. This means that the income of the 20% with the highest incomes is here more than 5 times as high as the income of the 20% with the lowest incomes.

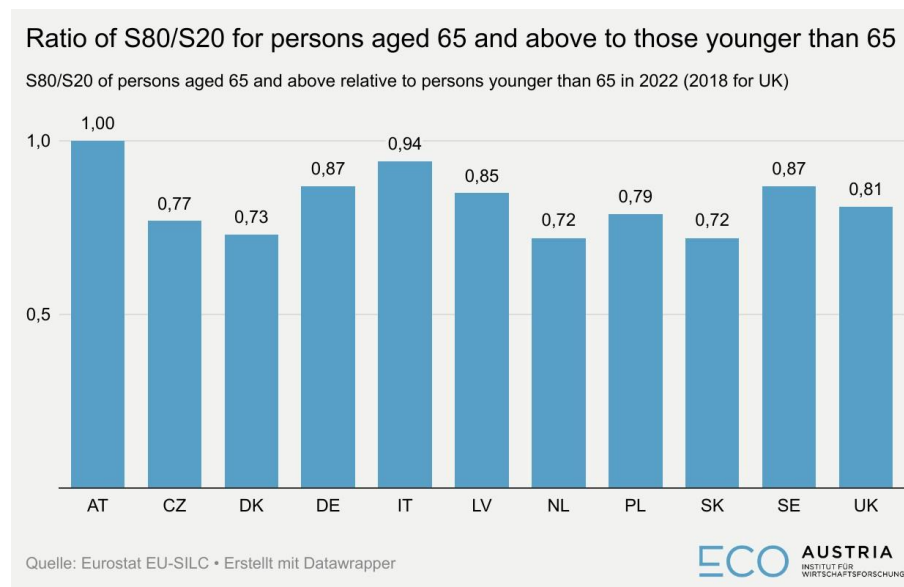
The countries with the most balanced income distribution within the observed age group are Slovakia, the Netherlands and the Czech Republic, with values of 2.4, 2.9 and 2.7 respectively. Austria and Germany are in the middle of the sample, with values of 4.3 and 3.9 respectively.

Equitability across

As mentioned in the definition, the equitability criterion must not be solely related to the redistributive aspects. A second perspective focuses on the distribution “across” the age-threshold of 65 years. This second aspect is considered by the criterion “equitability across”. For this purpose, the ratio of a country’s S80/S20 value for persons aged 65 and above divided by the comparative S80/S20 value for persons younger than 65 was calculated. A value near to 1 indicates a smooth income distribution across the age break of 65 years and is thus interpreted as an indication for a higher level of equivalency. In this case, the income distribution is neutral at the age limit of 65 years. This is interpreted as a positive sign for equitability across the age limit. Conversely, a distance to 1 is interpreted as a sign for a lower degree of equitability. Here, one must keep in mind that a distance from 0 might go in two opposing directions. Deviations are treated negatively in both directions.

If the income distribution is more even for the older population than for the younger population, then the equitability ratio is smaller than 1. Conversely, if there is a steeper distribution for the older population than for the younger population, then the ratio is greater than 1. Our sample of 11 countries contains only examples for the first case. The ratio is either 1 or smaller than 1. In an extended country comparison covering all EU Member States, the minimum and maximum values are Luxembourg with a ratio of 1.5 (indicating a much steeper income distribution for the older population) and Bulgaria with 0.7 (indicating a much smoother income distribution for the older population).

Figure 96: Equitability across – S80/S20 of persons aged 65 and above relative to persons younger than 65

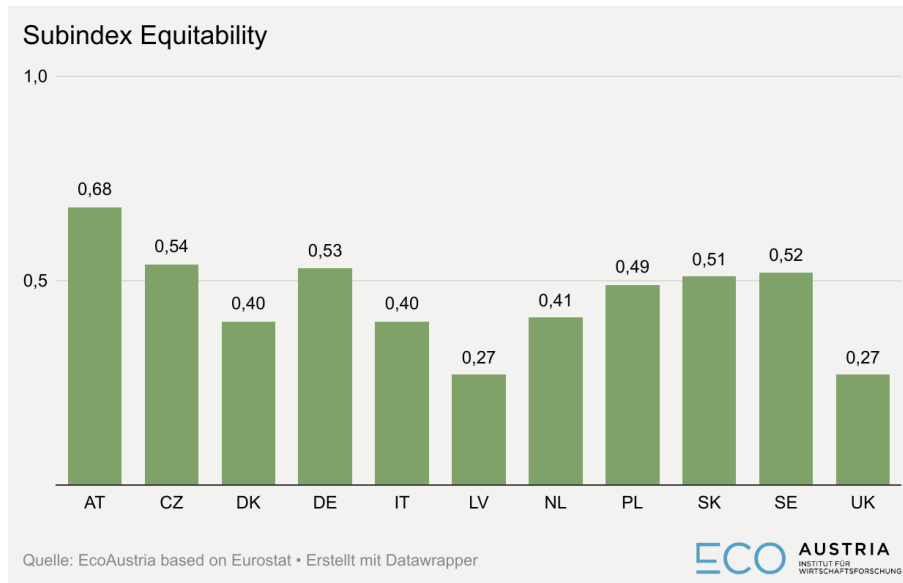


The countries observed show a much variation regarding the “equitability across” perspective. Countries such as Austria or Italy have an already smooth or stable transition across the age limit of 65 years. At a ratio of 1 the S80/S20 indicator is the same for older and younger persons in Austria. This indicates that the overall pensions system does not effectuate additional redistribution, compared to the overall income system. Other countries like Denmark or the Netherlands, but also the Czech Republic, show a larger deviation from 1, suggesting that the income distribution is more even for older people but differs from the overall distribution. This may be seen as an advantage regarding redistributive aspects, but it is detrimental to the goal of equivalence over a lifetime. Therefore, these deviations are interpreted negatively in the context of the “equitability across” perspective.

Synthesis Equitability

The summary subindex for the equitability criterion is calculated as average for both, the “equitability within” and the “equitability across” indicator. First, it must be mentioned that over the full set of EU Member States plus UK both indicators are not correlated to each other. They consider two different and independent conditions. The two perspectives are not related to each other.

Figure 97: Synthesis Subindex Equitability



The country with the best scores across both dimensions is Austria, ranking 1st in terms of “equality across” and 4th in terms of “equality within”. Austria achieves an overall value of 0.68. At 0.27 for both the two countries with the lowest equitability values are Latvia and the UK. The remaining countries observed reach medium values, ranging from 0.4 for Italy up to 0.54 for the Czech Republic respectively.

2.14.5. Robustness

According to the definition given by World Bank authors (World Bank, 2008), a robust system is one that has the capacity to withstand major shocks, including those coming from economic, demographic, and political volatility and unpredictability. Whereas the sustainability criterion (Section 2.14.2, above) is focused on long-term structural conditions, the robustness criterion refers to exogenous and unforeseeable volatilities. The idea behind the robustness criterion is that the functionality of pension systems is threatened by risks that are hard to be foreseen. In this context, a lack of foresight must be captured in the institutional setting of pension schemes to meet the objective of reliability and trustworthiness from the perspective of the participants in a pension scheme. As much as possible, reliable pension schemes must protect them against volatility risks that are exogenous to the pension scheme.

Development of private and funded pensions during the financial crisis 2008/2009

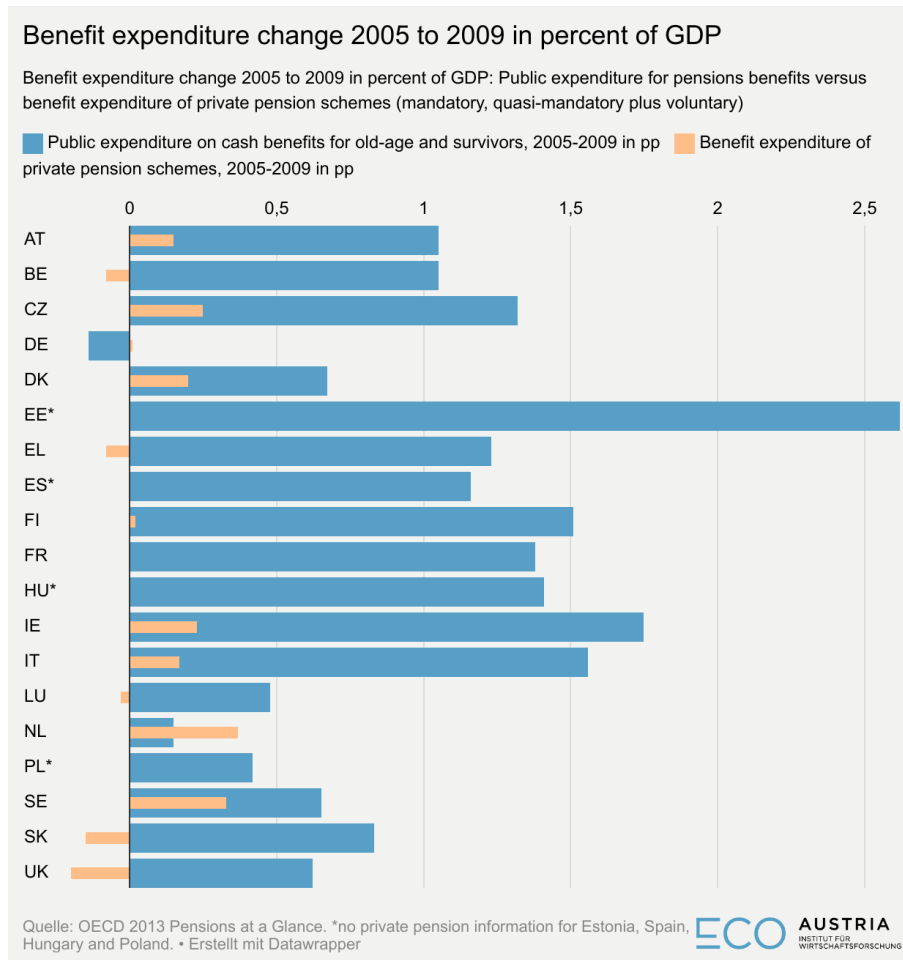
According to our definition, robustness can hardly be assessed from a purely theoretical or institutional point of view. In other words: The Titanic was considered unsinkable in the public and media perception. The end of the story is known. The problem is similar with pension systems: Their robustness against unforeseeable shocks must be assessed in the context of actual macroeconomic shocks. Their rarity may generally be considered fortunate, but this makes the assessment of the robustness of pension schemes difficult.

Robustness is often seen as the main comparative advantage of PAYG systems. For sure, PAYG-systems have proven stable to macroeconomic shocks in the past. For instance, this was the case during the years of the financial crisis 2008/2009. However, the advantageous robustness of public PAYG systems comes at a price: In public PAYG systems, the exogenous risk of volatility is often transferred to the public sector and to the stabilizing financial power of the taxpayers of the economies. However, externalising risk to the public budget is relevant from an economic point of view, but it is not undermining the robustness criterion per se. For the robustness criterion it is relevant that a pension scheme is capable to cover risks from unforeseeable exogenous volatilities. For the PAYG systems considered here this is, strictly speaking, the case.

The OECD Pensions at a Glance publication for 2013 (OECD, 2013) provides information on public spending on public old-age and survivors pensions over the years 2005 to 2009 relative to the corresponding benefit expenditure from funded pension schemes over the same timespan. Both values are measured in percent of GDP. The following analysis looks at differences in the development of benefit spending from public and from funded pensions. This provides an indication for the stability of the two financing mechanisms in a period of volatility and exogeneity.

While public benefit expenditure relative to GDP continued to rise significantly for most countries over the period from 2005 to 2009, spending on benefits from privately funded pensions shows a different pattern. As shown in Figure 98, benefit spending from funded pensions has already stagnated at about zero. The increase in benefit payments from public funding exceeded the comparative increase of benefit payments from funded pensions by far, for most of the countries observed. Exemptions to this are Germany and the Netherlands. While for Germany public spending on public pensions already decreased relative to GDP, benefit payments from funded pensions increased at least marginally at about 0.01 percentage points. Also, in the Netherlands the evolution of benefit expenditure from private pensions outperformed that of public pensions, with an increase of 0.37 percentage points of GDP for benefit payments from funded pensions compared to 0.15 for public pensions.

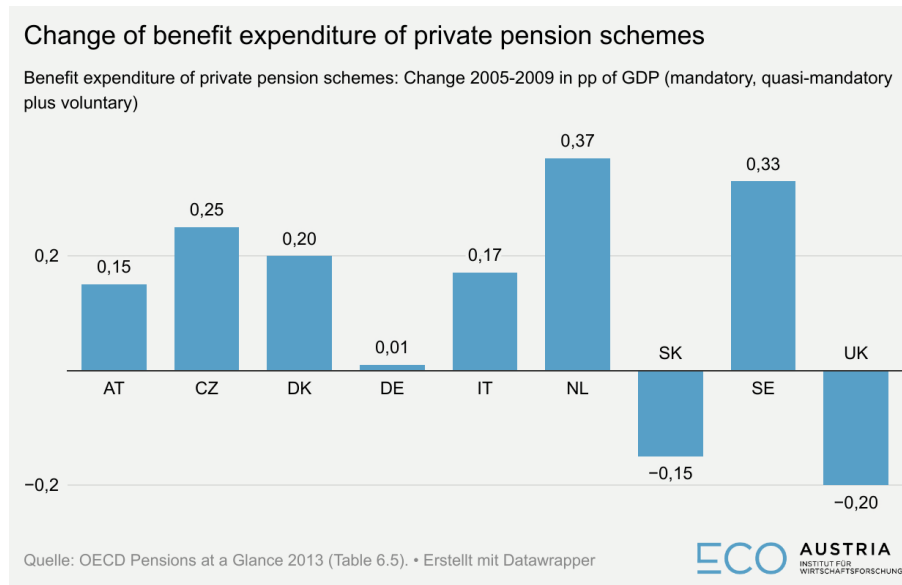
Figure 98: Benefit expenditure increase of public versus private schemes 2005 to 2009



Benefits paid from funded plans during the financial crisis 2008/2009

As a first indicator, the evolution of benefits from funded schemes over the years 2005 to 2009 is taken into consideration (Figure 99). However, among the countries compared no data is published for Poland and Latvia. The countries with the best scores according to benefit spending during the financial crisis are Sweden and Netherlands. Both show significant increases, at 0.37 and 0.33 percentage points of GDP respectively. The countries with the largest declines were Slovakia and the UK with changes of -0.15 and -0.2 percentage points. Austria, Italy, Denmark and the Czech Republic range in the middle of the ranking, with marginal increases in expenditure between 0.15 and 0.25 percentage points.

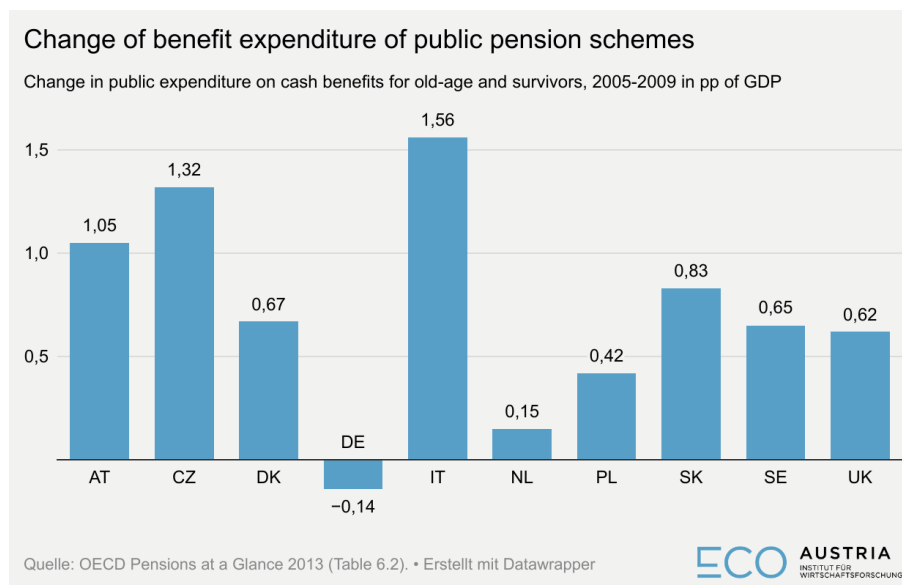
Figure 99: Changes in expenditure for benefits from private pension schemes 2005-2009



Benefits paid from public pensions during the financial crisis 2008/2009

Analogous to private and funded pension benefits during the financial crisis, we analyze the corresponding changes in the expenditure for public pension benefits. The analysis looks at cash benefits for both, old-age and survivors' pensions. Again, data is based on indicators from the OECD 2013 Pensions at a Glance publication (OECD, 2013). Again, the change in expenditure over the period from 2005 to 2009 is measured in percentage points of GDP. Decreases are treated as unfavourable in terms of robustness.

Figure 100: Changes of spending for benefits from public pension schemes 2005-2009



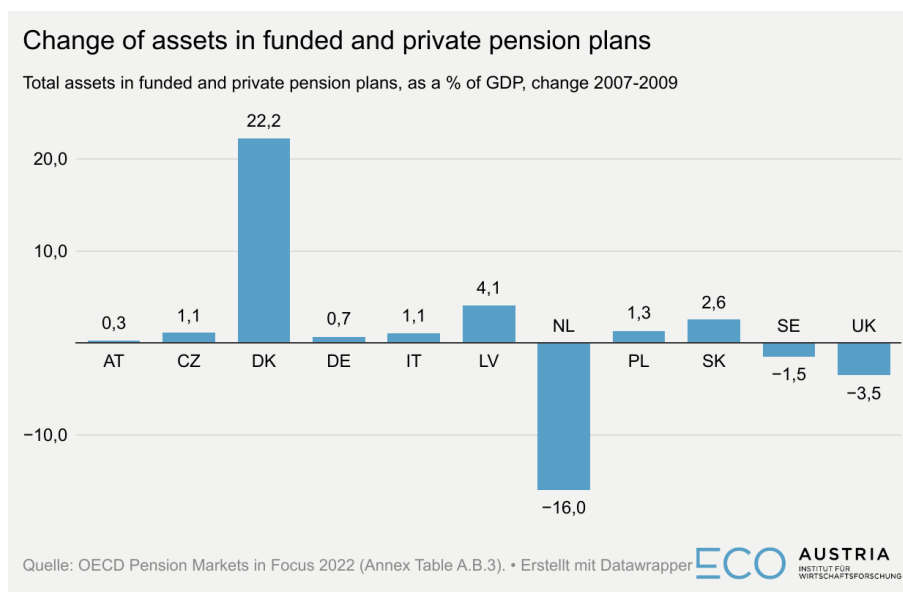
The countries under review show large differences in terms of changes in benefits expenditure from public schemes. Italy and the Czech Republic stand out positively. Both countries recorded increases in public pension spending at 1.56 and 1.32 percentage points, respectively.

Germany showed a marginal decrease of 0.14 percentage points in the period under review. In the Netherlands, public pension spending almost stagnated at 0.15 percentage points. The other countries show a medium development, ranging from 0.4 percentage points in Poland to 1.05 percentage points in Austria.

Assets in funded pensions during the financial crisis 2008/2009

The analysis of developments during the 2008/2009 financial crisis is supplemented by the analysis of assets in funded and private pension plans. This step seems necessary, because no data on benefits from private pension plans are published for Poland and Latvia (Figure 99).

Figure 101: Change of assets in funded and private pension plans in percentage points of GDP, 2007-2009

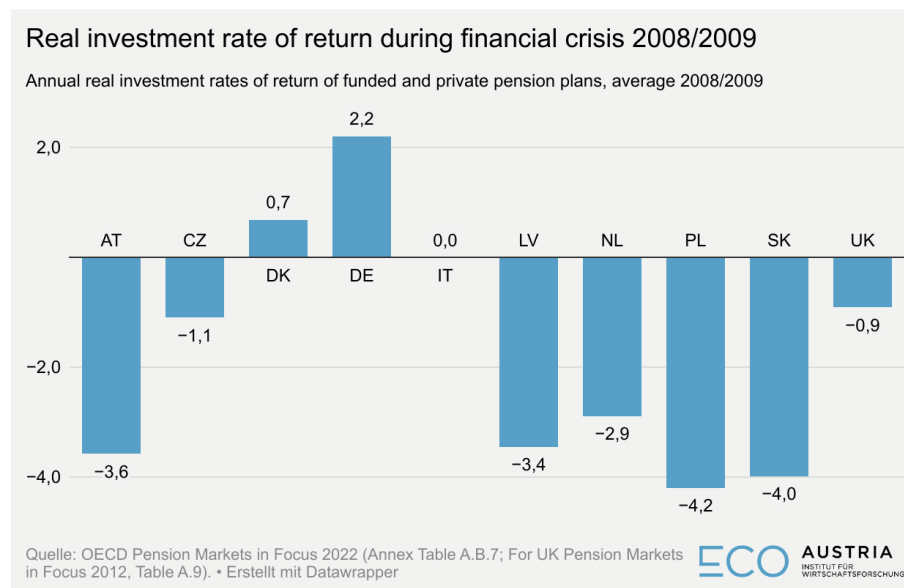


In Figure 102, the change of total assets in funded and private pensions as a percentage of GDP during the years of the financial crisis is considered. Data is based on OECD's publication Pension Markets in Focus (OECD, 2023). Hereby, the change of total assets from 2007 to 2009 is compared between our 11 countries. For Denmark an increase by 22.2% of total assets is recorded. On the other side of the scale is the Netherlands, with total assets falling from 124.6% of GDP in 2007 to 108.8% in 2009, a drop of 16 percentage points. Decreasing assets are also recorded for Sweden (1.5 percentage points) and for the UK (3.5 percentage points).

Annual real investment rates of return for funded and private pension plans during the financial crisis 2008/2009

A third analysis of funded pensions during the financial crisis considers real investment rates of return. The average real investment rate of return over the years 2008 and 2009 is considered. Data is taken from OECD's 2022 Pension Markets in Focus publication. For the United Kingdom data is derived from the 2012 Pension Markets in Focus Report (OECD, 2012).

Figure 102: Real investment rate of return 2008/2009



As expected, the real rate of return developed negatively for most countries in our sample. This applies in particular to Poland with -4.2% and Slovakia with -4%. Only Denmark (0.7%) and Germany (2.2%) show positive developments. All other countries show declines, ranging from -0.9% in the UK to 3.6% in Austria.

Current risks from inflation pressures and the Ukraine crisis

Currently, the most relevant risk harming the robustness of pension systems is stemming from inflationary pressures. These risks are especially relevant for the funding position of DB plans. Higher inflation rates affect the returns of selected asset classes and the funding position of defined benefit plans (OECD, 2023, p. 58). Pension providers were already facing rising inflation before 2022, due to supply side effects in context of the COVID pandemics and bottlenecks in national and international supply-chains. However, these inflationary pressures were exacerbated by the war in Ukraine from the first quarter of 2022.

Rising inflation might affect pension funding by two channels: 1) inflation potentially undermines the asset values and the investment performance. The impact of inflation varies by asset class. According to OECD's Pension Markets in Focus, the rise of inflation particularly affects the investment performance of some classes that provide a fixed nominal stream of income, e.g., fixed-rate bonds (OECD, 2023, p. 59). The rise of inflation may lead to lower or even negative investment rates of return driven by assets-sided effects. 2) A rising inflation can also deteriorate the funding ratios of DB plans if benefits increase due to indexation.

Within the scope of inflationary risks, also the relationship between inflation and interest rates are relevant. Under the impact of inflationary pressures, central banks and monetary policy are expected to respond by raising interest rates to dampen inflation. Changes in interest rates may impact some assets value depending on the asset structure in the portfolios of pension providers. Higher interest rates may negatively affect the earnings and stock prices of some companies. Here, higher borrowing and capital costs must be kept in mind, as well as decreasing revenues

stemming from reduced consumer demand and consumption. Therefore, the asset values for pension funds and providers might decrease. The price and value of existing bonds may also decline due to opportunity cost compared to newly issued and higher-yielding bonds.

On the other hand, higher interest rates could be advantageous for funded DB plans and their funding position. Higher interest rates lead to an increase in the discount rate that is used in the calculations of the liabilities of DB plans, automatically devaluating the liabilities of the plans. This reduction in the present value of liabilities can improve the funding position of DB plans depending on the duration gap between the assets-side and the liability-side. This will be the case, when the weighted average duration of liabilities exceeds the weighted average duration of assets.

Regarding the robustness of pension systems also the risk of declining growth must be considered. Declining growth rates will affect not only affect the macroeconomic development of value added as financing condition for public PAYG-systems, but also the surrounding conditions for funded pensions. Reducing growth may lead to lower investment returns and could therefore affect the investment performance of pension providers.

Total assets in IORPs' pension plans in the 4th quarter 2022

The most recent information on the funding position, at least on the asset side, for funded occupational pensions is provided by quarterly IORP data within the scope of EIOPA's occupational pension statistics⁸⁴. Some of the countries for which data are available show declining investment assets between the fourth quarter of 2020 and the fourth quarter of 2022. However, data are provided for only six of the 11 countries relevant here. Declining asset values are especially indicated for Germany and for the Netherlands with -7.1% and -14.6% respectively. However, the exemption to the rule is Sweden. IORP occupational plans here show a fundamental increase of investment assets by nearly 40%.

⁸⁴ The quarterly data on occupational pensions from IORP plans is published on the EIOPA website under the [Weblink](#).

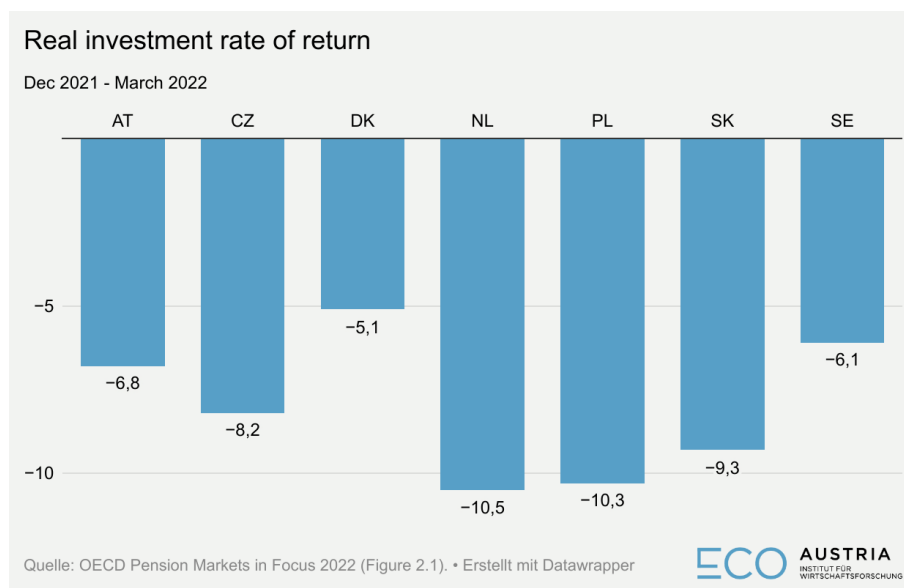
Figure 103: Change in total assets in occupational IORPs pension plans from 4th quarter 2020 to 4th quarter 2022



Real investment rate of return up to March 2022

OECD's Pension Markets in Focus (OECD, 2023) comprises information on recent developments of the real investment rates of return over the period from December 2021 up to March 2022. The indicator looks at robustness in the context of the current Ukraine crisis. The war started in February 2022. The consequences of the war-conflict are almost evident by March 2022. All countries show negative real rates of return up to the 4th quarter of 2022, ranging from -5.1% in Denmark to -10.5% in the Netherlands.

Figure 104: Real investment rate of return up to March 2022

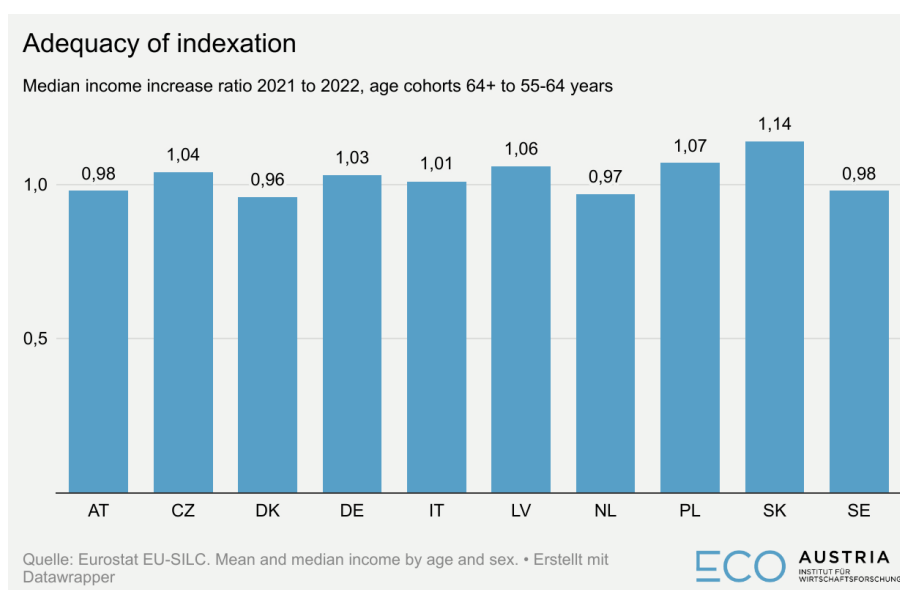


Adequacy of indexation over inflation

In the current situation all forms of income above all age cohorts face inflationary pressures. As for workers inflation might be covered to a certain degree by wage increases, pensioners' income either rely on automatically institutionalised indexation mechanisms or on discretionary policy decisions. In a situation of raising inflationary pressures, the maintenance of the present value or the purchasing power of pension benefits is a criterion for the robustness of pension systems. In 2022 almost all countries compared had been exposed to inflationary pressures. By the following indicator the capacity of the overall pension system to capture inflationary pressures and to maintain the purchasing power of pension benefits is considered. The increase in median equivalised net income from 2021 to 2022 is measured and compared between the 65 and older age cohort and the 55 to 64 age cohort. The income of the older age cohort, aged 65 and over, is assumed to be more dependent on pension payments. Therefore, the development of net income for this older age group is expected for being more intensely influenced by the indexation of benefit payments.

The capacity of maintaining the purchasing power of pension benefits within the overall pension system is interpreted as an indication for robustness. This is evaluated using the growth rate of median income from 2021 to 2021 for those aged 64 years old and over relative to the comparative growth rate of those aged 55 to 64. Accordingly, a value of 1 indicates that the incomes of both age groups have increased at the same rate. A value greater than 1 indicates that the incomes of the elderly have increased at a higher rate. Accordingly, a ratio value of less than 1 indicates that the increase in the older cohort has not kept pace with that of the younger cohort. For the assessment of robustness, the capacity to maintain purchasing power of pensions against inflationary pressures is signalled by ratios that are 1 or even greater than one. Data is based on the median equivalised income published by Eurostat within the scope of EU-SILC.

Figure 105: Adequacy of indexation by ratio of median income increase from 2021 to 2022 for age group 64 and older to 55 to 64 years

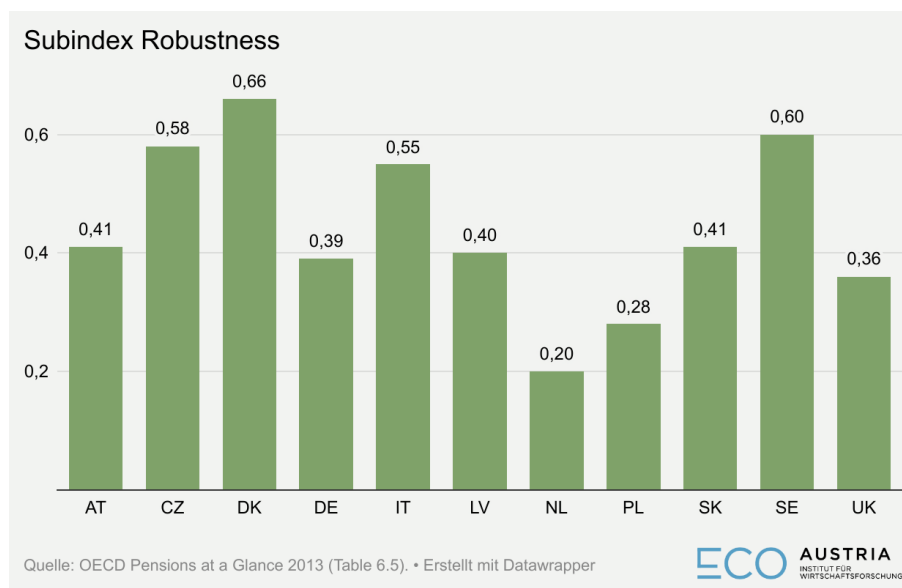


The adequacy of indexation ratio is greater than 1 for most of the countries observed. This indicates that for these countries the indexation of benefits is capable to cover inflationary pressures and maintain the purchasing power of pensions. For Austria, Denmark and for the Netherlands the ratio is smaller than 1, indicating that in these countries the increase in median income for the older age group has not kept pace with the comparative increase for the younger age group. This is interpreted as an indication that pension indexation in these countries may not be able to fully cover inflation risks.

Synthesis Robustness

The subindex on robustness comprises 7 indicators: 1) the development of funded pensions benefits during financial crisis, 2) the development of public pensions benefits during financial crisis, 3) the development of total assets during from 2007 to 2009, 4) funded pensions real investment rates of return as an average over the years 2008/2009, 5) recent trend for assets in IORP funded plans up to the 4th quarter 2022, 6) recent development in real investment rates of return up to March 2022 and 7) adequacy of benefit indexation ratio, calculated from the growth rates of net income for persons aged 64 years and above relative to persons in the age cohort with 55 up to 64 years. Results are shown in Figure 106.

Figure 106: Synthesis Subindex Robustness

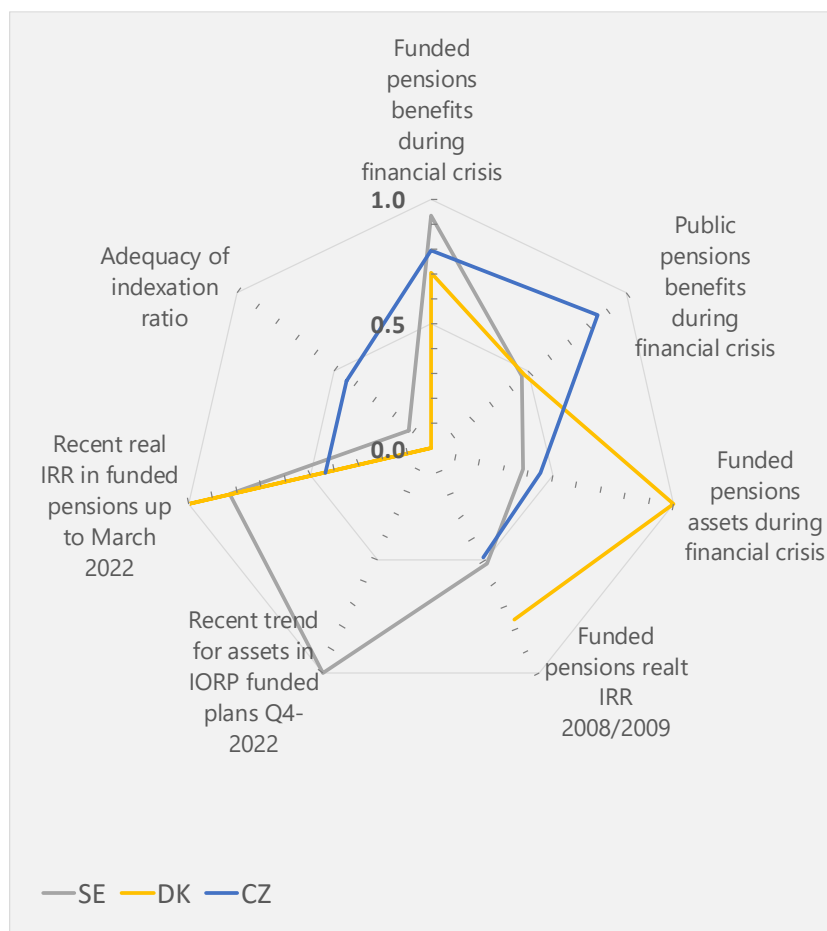


There are major differences between the countries in terms of robustness. Denmark and Sweden achieve the best values across all indicators considered within the robustness criterion. The corresponding subindex values for the robustness criterion are 0.66 for Denmark and 0.6 for Sweden. The weakest result regarding robustness is recorded for the Netherlands with a subindex score of 0.2.

The strengths/weaknesses profile (Figure 107) shows two things. First, the leading countries have very heterogeneous profiles, and second, the indicator set for the robustness criteria is at this

stage incomplete. A complete set over all 7 indicators is only available for 3 out of our 11 countries. This is namely the case for Sweden, the Slovak Republic and the Netherlands.

Figure 107: Country comparison for the robustness criterion – Leading countries Sweden, Denmark and the Czech Republic



Overall, Denmark is the leading country regarding robustness. For Denmark data on the recent development of total assets in funded plans is missing. A rather weak performance was noted regarding the indexation of benefits in 2022. Payments for public pension benefits developed at an average rate during the years of the financial crisis. In terms of all other indicators, however, Denmark shows a very positive performance. Assets in funded pensions performed well during the financial crisis and Denmark currently shows the smallest decline in the real rate of return in funded pensions among the countries surveyed.

A complete set of indicators is available for Sweden. Like Denmark, Sweden also shows rather weak results regarding indexation, i.e., median income of elderly relative to the age cohort of 55 to 64 years old. Based on the assumption that the development of median income might more intensively rely on pensions, this is treated as a sign for weaker or at least time delayed indexation mechanisms in Sweden and Denmark. However, Sweden reaches top results regarding the development of benefit payments from funded pensions during the financial crisis and with regard to the recent development of real rate of return in funded pensions up to the 4th quarter 2002. The

recent decline of the real rate of return was at the second lowest level for Sweden, following Denmark in the first position.

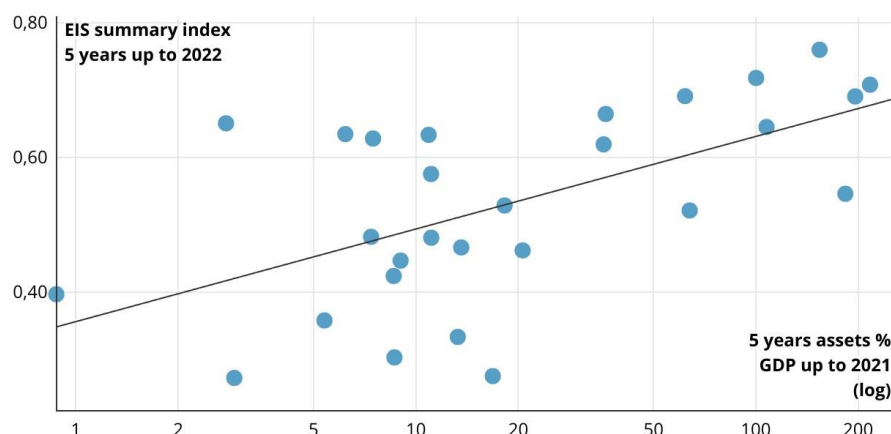
The Czech Republic is the country ranking third regarding robustness. However, for Czechia no data on recent developments of total assets in funded pension plans up to the 4th quarter 2022 is provided. The Czech Republic achieves the best results for the first two of the indicators considered. This means that benefit payments from both public and private schemes have been relatively stable during the years of the financial crisis. Czechia is reaching average scores for the rest of the indicators.

2.14.6. Market capitalization

Capitalization is achieved when a pension system can provide investment capital and foster innovation and business dynamics. Investment from funded pension assets can serve as a funding source for innovation and business dynamism. The criterion of market capitalization targets the ability of funded pension schemes and corresponding assets to provide for market capitalization. Whereas in PAYG systems the payments from contributions (and from taxes) flow into an administrative distribution mechanism, a capital stock is accumulating in funded schemes. This capital stock serves as investment basis and can promote the capitalization of financial markets. The evaluations show that assets in funded and private pension plans are correlated with innovation performance. In this context, the share of assets invested in the home country also has also funding relevance for innovation and startups.

Figure 108: Assets in funded and private pension schemes as percentage of GDP (2017-2021) and country scores from the European Innovation Scoreboard (2018-2022)

Assets in funded and private pensions as a percentage of GDP versus European Innovation Scoreboard (EIS) values



Quelle: OECD and European Commission • Erstellt mit Datawrapper

As shown in Figure 108 the capital stock from private and funded pension, as indicated by the 5-year average assets relative to GDP, is positively correlated with the countries' score within European Innovation Scoreboard (EIS). The results show that countries with higher assets in

funded and private pensions, for example Denmark or Netherlands, are achieving better results in the EIS (EU, 2022). Figure 109 indicates that especially the share of assets that are invested in a country's own economy could be relevant for higher innovation scores within the EIS. For example, Denmark was achieving the highest scores in the last five innovation scoreboard rankings. At the same time, pension assets invested in Denmark amounted to more than 140% of GDP. This is the highest home-investment share from all countries observed (Figure 113). About two thirds of the total invested assets (about 220% of GDP) are directly invested in the Danish economy.

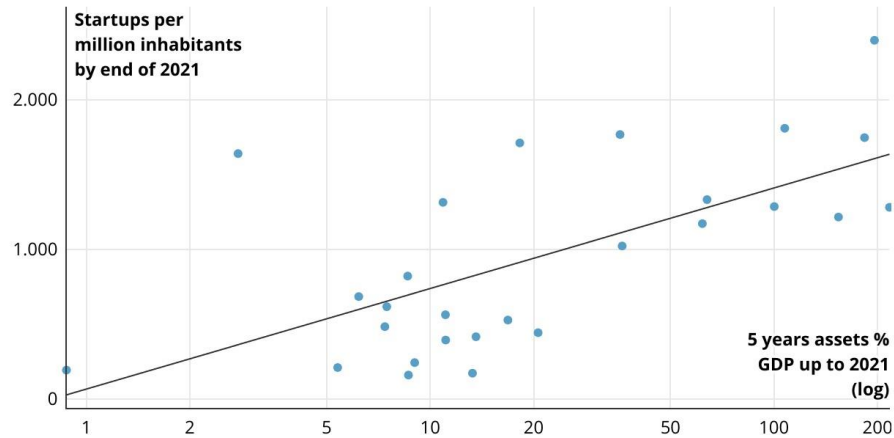
Figure 109: Assets in funded and private pension schemes invested in own country (2017-2021) and country scores from the European Innovation Scoreboard (2018-2022)



Quelle: OECD and European Commission • Erstellt mit Datawrapper

Figure 110: Assets in funded and private pension schemes as percentage of GDP (2017-2021) and number of startups per million inhabitants per end of 2021

Assets in funded and private pensions as a percentage of GDP versus startups per million inhabitants

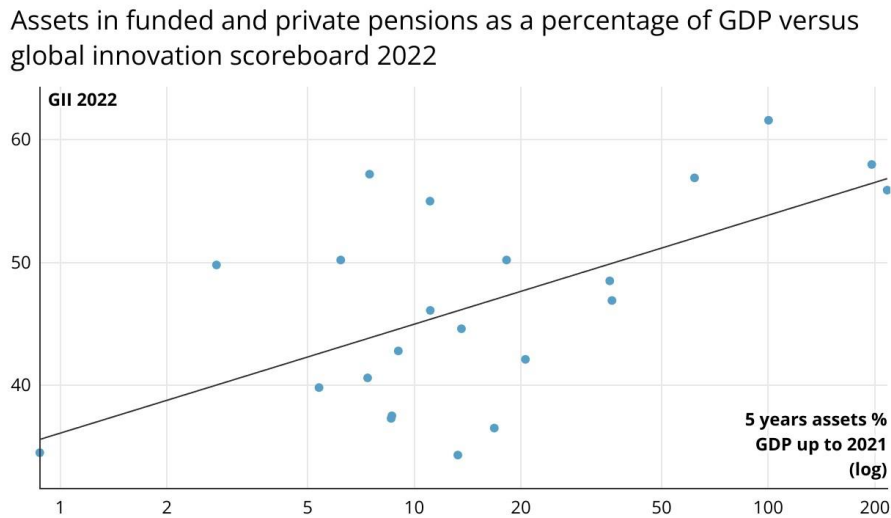


Quelle: OECD and Dealroom • Erstellt mit Datawrapper

Countries with higher assets in funded and private pension schemes also show a higher startup dynamic. With 2,400 startups per million inhabitants (Figure 110) the Netherlands is the country with the highest number of startups at the end of 2021. At the same time, the Netherlands, following Denmark, has the second highest volume of assets in funded and private pension funds as a percentage of GDP.

The innovation hypothesis is confirmed when country scores from the Global Innovation Index, published by the international patent organisation WIPO, are taken into consideration (Figure 111). The countries with the highest volume of assets in private and funded schemes within the last five years (2017 to 2021) are Denmark and the Netherlands. They are ranking 2nd and 5th according to the Global Innovation Index (WIPO, 2022). Sweden is the leading country in WIPO's GII ranking, while also ranked 3rd in terms of assets in private and funded pensions.

Figure 111: Assets in funded and private pension schemes as percentage of GDP (2017-2021) and country scores in the WIPO Global Innovation Index 2022



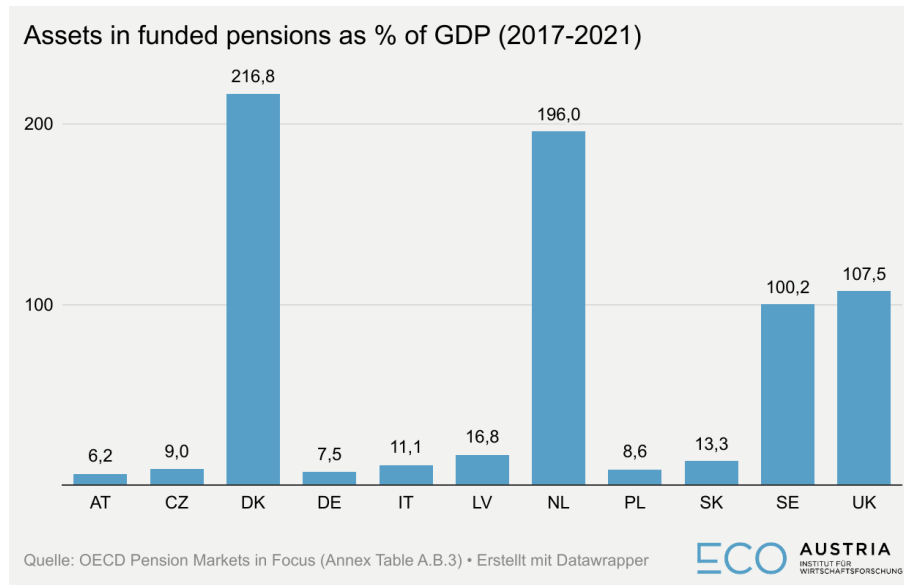
Quelle: OECD and WIPO • Erstellt mit Datawrapper

Assets in funded and private pensions

The first indicator used for the assessment of market capitalization is the volume of assets in funded pensions in percent of GDP. The values correspond to the five-year average over the years 2017 to 2021, based on data from the OECD's Pension Markets in Focus (OECD, 2023, Annex Table A.B.3).

In principle, the countries reviewed show very large differences in terms of funded pension assets (Figure 112). Four countries stand out. These are Denmark with an asset volume of 217% of GDP, the Netherlands with 196%, the UK with 107.5% and Sweden with 100%. All four countries have a strong focus on private and occupational funded pension schemes as part of their overall pension system. The other countries in our compilation have significantly lower pension assets, ranging from 6.2% in Austria up to 16.8% in Latvia (Figure 112).

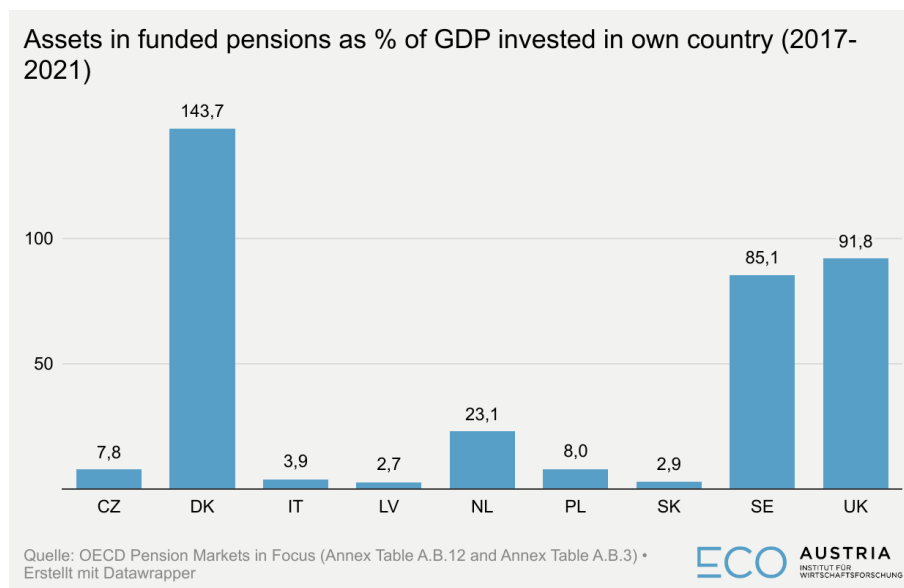
Figure 112: Assets in funded pensions as percentage of GDP



Assets in funded and private pension invested at home

The results of the above statistical analysis indicate that the volume of assets invested domestically, i.e. in a country's own economy, could be relevant for economy-wide innovation (Figure 109). The results apply to the 5-years average of assets invested domestically as percentage of GDP. Data is again taken from OECD's Pension Markets in Focus (2023, Annex Tables A.B.3 and A.B.12 respectively).

Figure 113: Assets in funded pensions invested in own country (2017-2021) as percentage of GDP



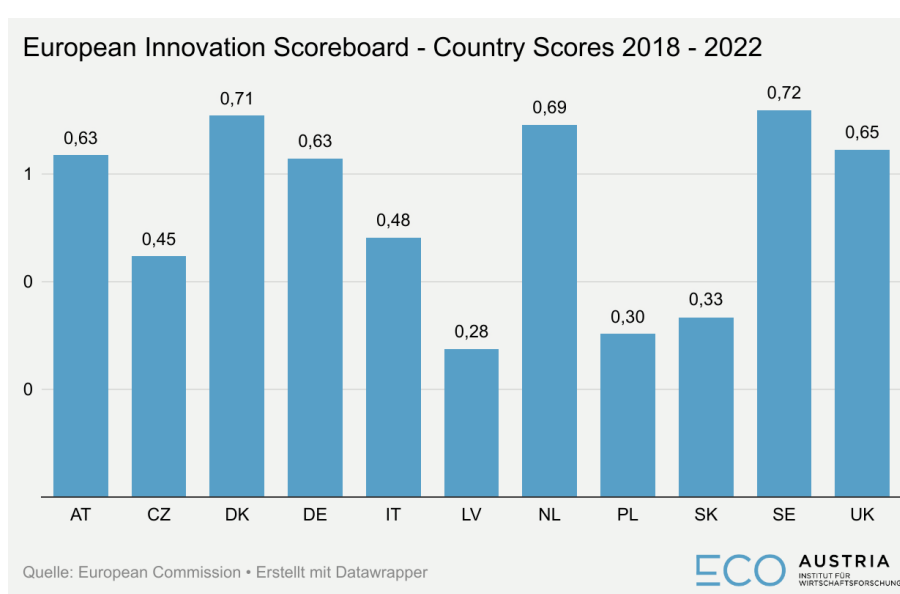
As regards the amount of assets invested domestically, three countries stand out. Namely these are Denmark (144%), the United Kingdom (91.8%) and Sweden (85.1%). All three countries are ranking high and above average regarding the EIS ranking over the 5-year period from 2018 to 2022. Of the 39 countries included in the EIS ranking Denmark was ranked 3rd, the UK 8th and

Sweden 2nd. While the Netherlands has a high overall asset volume, more than 88% of assets are invested in foreign markets and only 11.8% domestically.

Country scores in European Innovation Scoreboard

According to our innovation hypothesis, assets in funded pensions can be a driver for innovation and business dynamics in an economy. The results of the statistical analyses presented above (Figure 108 to Figure 111) confirm this hypothesis. As shown in the next section, assets in funded pension funds also encourage venture capital investment (Figure 115). Hereinafter, the results of the European Innovation Scoreboard are considered (Figure 114).

Figure 114: European Innovation Scoreboard 2018 - 2022



The leading countries in the EIS ranking are Sweden with an index score of 0.72, Denmark with 0.71 and the Netherlands with 0.69. Latvia with 0.28, Poland with 0.3 and the Slovak Republic with 0.33 have greater catching up potential. The other countries observed show medium scores, ranging from 0.45 for the Czech Republic to 0.63 for Austria.

Venture Capital Investment

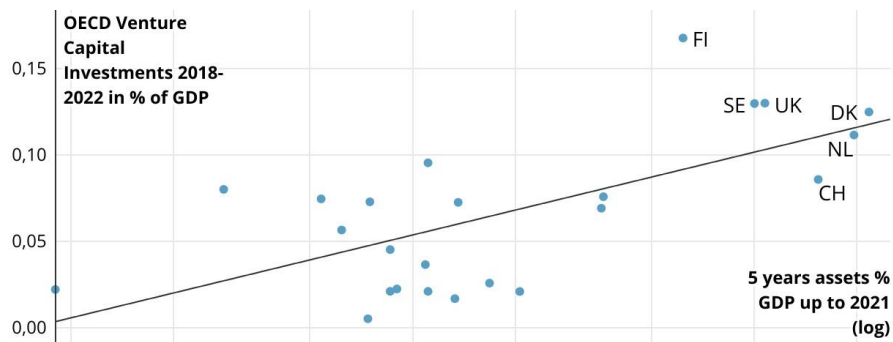
The comparison among European countries shows a statistical relationship between assets in private and funded pensions and venture capital investment. However, there is one exemption that is excluded from the scatterplot in Figure 115. Estonia has a well-established venture capital market and a highly developed start-up scene. However, funded pension assets are rather low. When Estonia is excluded from the country-set in Figure 115 the R^2 (based on a logarithmic scale) increases to 0.43. For all other countries, EU-Member States (except for Estonia) plus Switzerland, UK, and Norway, the statistical correlation is evident. Countries with high assets in funded pension schemes tend to have higher venture capital investment. Illustrative examples are Denmark and the Netherlands. As mentioned before, they rank 1st and 2nd in terms of assets relative to GDP. At the same time, their venture capital investments in 2021 was significantly

higher than the average: The two countries rank 4th and 5th out of 24 countries considered in terms of venture capital investments as a percentage of GDP (Figure 115).

Figure 115: Funded pension assets and venture capital investment, excluding Estonia

Assets in funded and private pensions as a percentage of GDP versus venture capital investment

Assets as percentage of GDP 2017-2021 versus venture capital investments as percentage of GDP 2018-2022



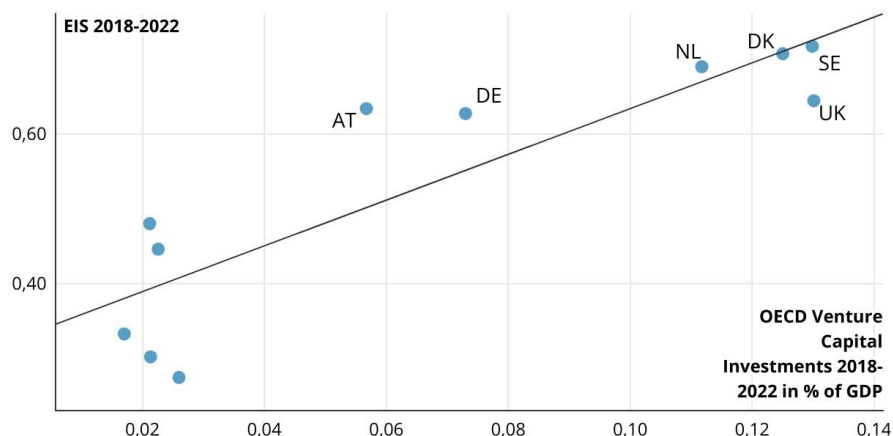
Quelle: OECD • Erstellt mit Datawrapper

Venture capital investments are an important lever for innovation. For the 11 countries considered, the statistical relationship between venture capital investment and innovation performance is evident from Figure 116. The statistical correlation between venture capital investments as a percentage of GDP and country scores in the European Innovation Scoreboard for 2018 to 2022 yields an R^2 of 0.76.

Figure 116: Venture capital and innovation – Statistical correlation between VCI and EIS country score

Venture capital and innovation

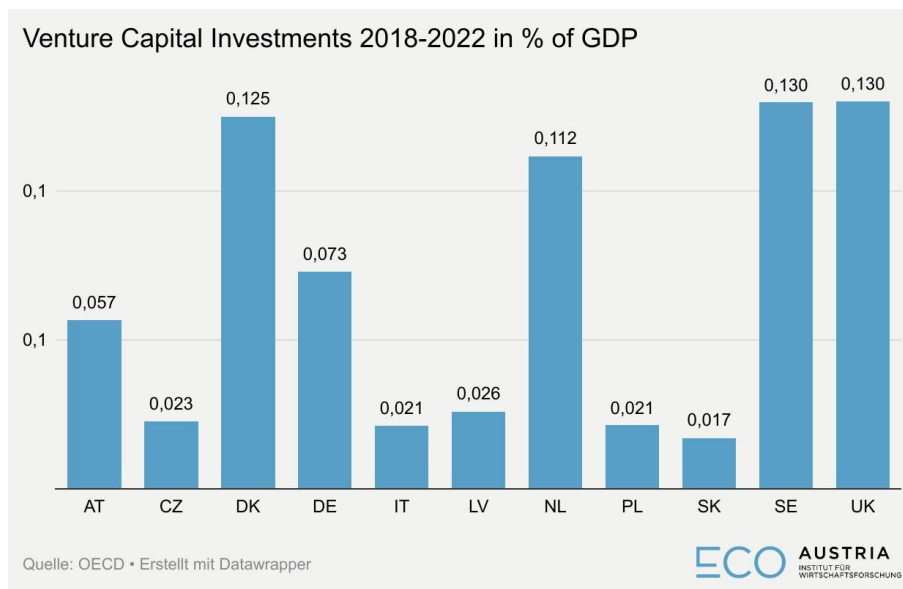
Statistical correlation between VCI in % of GDP (2018-2022) and EIS country score (2018-2022)



Quelle: OECD and European Commission • Erstellt mit Datawrapper

The countries observed show variation regarding venture capital investment and start-up financing (Figure 117). Again, Sweden, on par with the UK, reaches the highest value with 0.13% of GDP, followed by Denmark with 0.125% and the Netherlands with 0.11%. Among our comparison of 11 countries, these four also have the highest values regarding assets in funded and private pensions (Figure 115). Given the statistical correlation outlined above, it is no surprise that they are also leading in terms of venture capital financing. Except for Italy, almost all the countries with lower venture capital investments belong to the group of newer EU Member States. These are Czech Republic, Latvia, Poland and Slovak Republic. For Austria and Germany medium levels are indicated.

Figure 117: Venture Capital Investment as percentage of GDP



Synthesis Market Capitalization

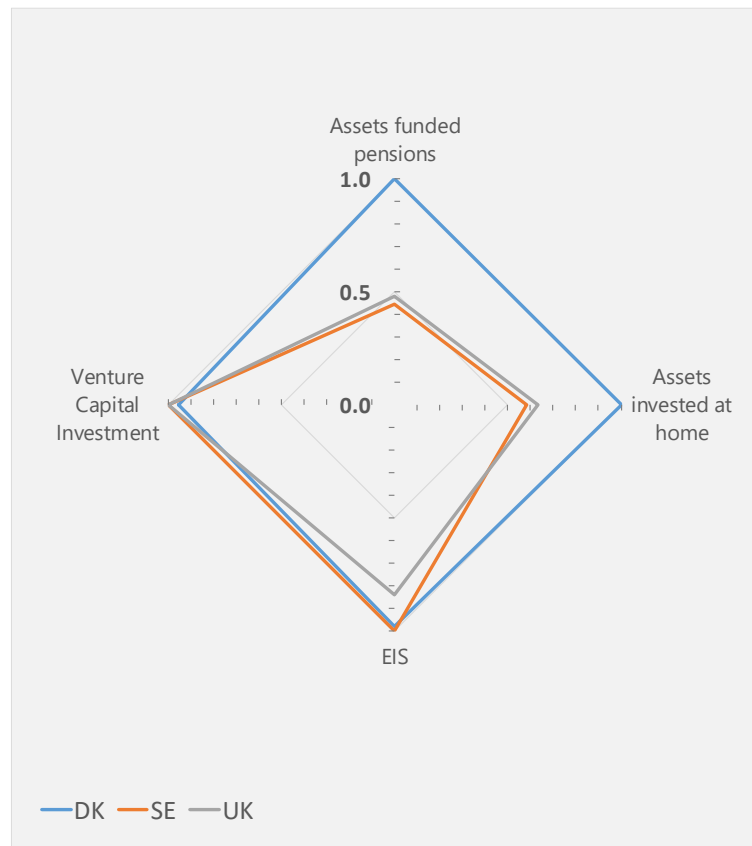
Hereinafter (Figure 118), the results for the subindex for the criterion of market capitalization are presented. The subindex is composed by 4 indicators. These are 1) assets in funded pensions over the 5 years period from 2017 to 2021 as a percentage of GDP, 2) the amount of assets invested in the own economy again from 2017 to 2021 as a percentage of GDP, 3) the country results from the European Innovation Scoreboard and 4) the share of venture capital investment relative to GDP from 2018 to 2022.

Figure 118: Synthesis Subindex Market Capitalization



The country with the best overall results is Denmark. At a subindex score of 0.98, Denmark almost achieves the maximum possible score. From a Danish perspective, the best values are achieved with regard to assets in funded pensions overall and assets in funded pensions invested at home. But also for venture capital investments (0.955) and innovation performance according to EIS scores (0.977) Denmark achieves top scores of almost 1 for (Figure 119).

Figure 119: Country comparison for the market capitalization criterion – Leading countries Denmark, Sweden and UK



2.15. Scoreboard-Assessment

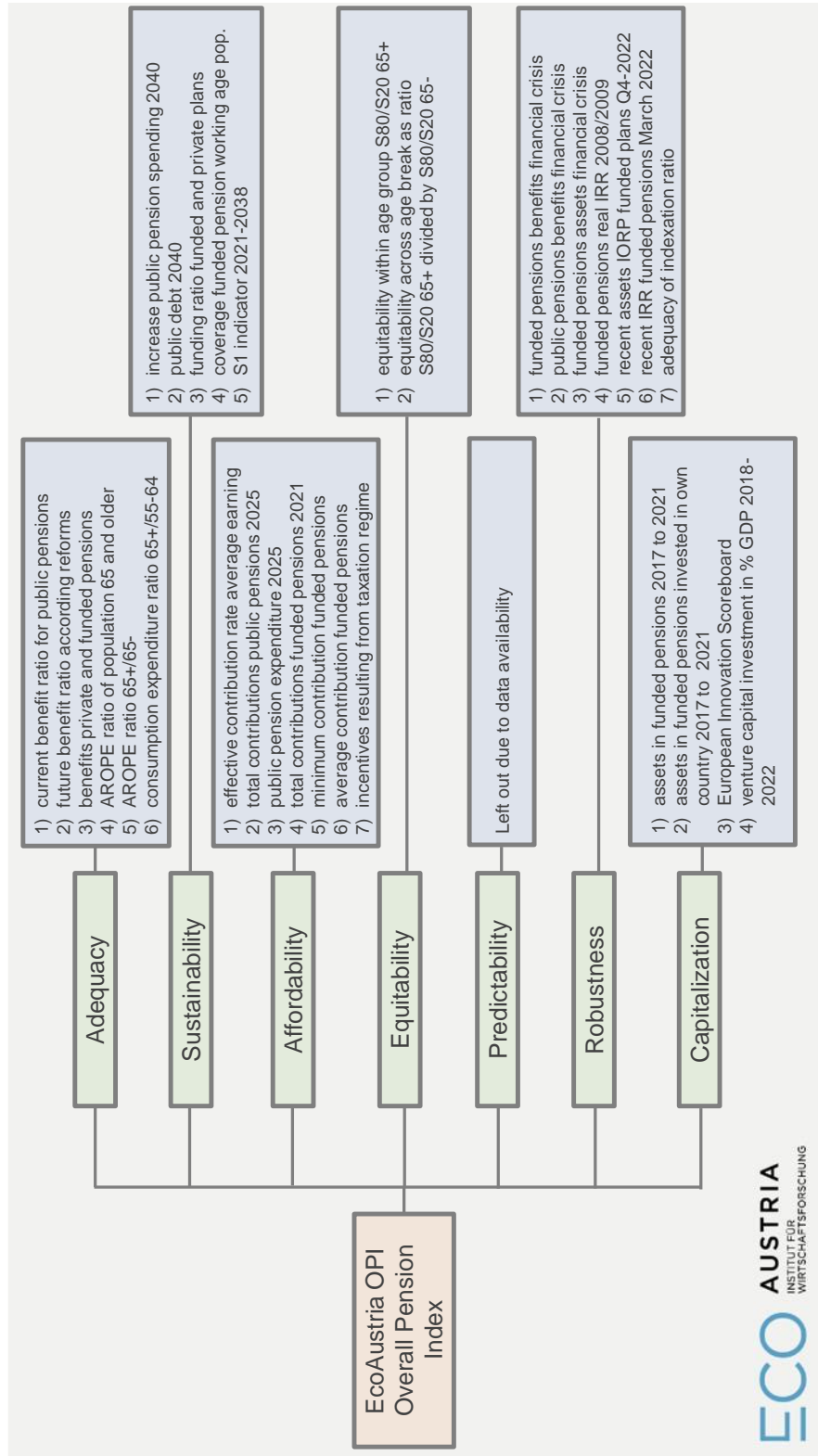
Hereinafter, an overall pension index over all criteria is presented. According to the definition of the criteria, derived from the literature, the overall quality of pension systems refers to the following criteria. These are adequacy, sustainability, affordability, equitability, predictability, robustness and market capitalization.

As shown above, the scores for the subindices were calculated from the average of the indicators included in each subdimension of the criterion (Figure 120). Accordingly, the overall pension index OPI is calculated from the average of all subindex scores. However, the results presented at this stage cover 6 out of 7 dimensions. The 5th criterion for predictability is omitted due to lack of data availability.

The results of the Overall Pension Index OPI are presented in Figure 121. Sweden and Denmark score best on the 6 criteria considered. They achieve scores of 0.695 and 0.688 respectively. The weakest results are presented for Italy (0.36) and for Latvia (0.41). The other countries out of 11 are reaching medium levels, ranging from 0.46 in Slovakia to 0.55 for the Netherlands.

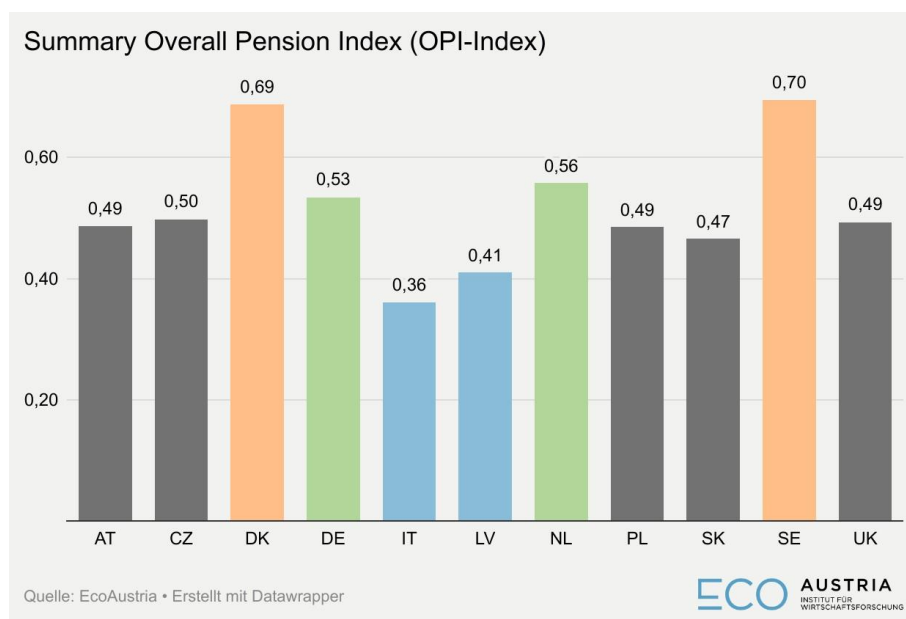
A second pair of countries, namely Germany and the Netherlands, rank below the leading countries and achieve values between 0.53 and 0.56. Together with the Czech Republic, Poland, the Slovak Republic and with the UK, Austria belongs to group of countries in the midfield that reach medium OPI scores between 0.47 to 0.50 (Figure 121).

Figure 120: Composition of the EcoAustria Overall Pension Index OPI and 31 key indicators



As shown in the profile for Sweden – as overall leading country –, the Swedish pension system achieves its best scores in terms of sustainability, robustness and market capitalization, ranking 2nd among 11 countries for each of these three criteria (Figure 122). But also, regarding other criteria, Sweden reaches good or at least medium results. For instance, Sweden ranks 4th regarding equitability or 5th in terms of affordability and adequacy. In other words: Sweden is a top performer in terms of sustainability, adequacy, and capitalization, but shows no weaknesses in any of the observed criteria.

Figure 121: Summary Overall Pension Index



Denmark is reaching the 2nd best result overall, de facto on par with Sweden at an overall index score of 0.68. Denmark scored best on the robustness criterion, ranking 1st among 11 countries, as well as on capitalization, also ranking 1st, and on adequacy, ranking 2nd among 11 countries. A more differentiated picture emerges for the Netherlands, which ranks 3rd overall. The Netherlands achieved the best scores in affordability and adequacy, ranking 3rd in both. The Netherlands achieves the 4th best result regarding capitalization. However, weaknesses are indicated for the robustness criterion with only an index score of 0.2, corresponding to the lowest index score among the 11 countries considered. Catching-up potential is also indicated for the equitability criterion, with the Netherlands ranking only 7th.

In Figure 123 the strengths/weaknesses profiles are shown for the countries with the overall weakest results, namely Italy and Latvia. It is shown that both countries also have their strengths. For instance, Latvia is ranking 1st regarding the sustainability criterion. For Latvia a high level of sustainability comes at the price of a low level of adequacy. However, as regards Latvia one must keep in mind, that the pension system is in a transition phase from a PAYG NDC system to an FDC system. In this sense, the adequacy of the Estonian pension system is probably underestimated by the indicators considered in the OPI assessment. Nonetheless, from the current perspective there is potential for improvement particularly regarding adequacy and

equitability. On the other hand, the country with the lowest OPI score, Italy, achieves a top score regarding adequacy, ranking 1st among 11. However, there is space for improvement, especially regarding sustainability and affordability. Figure 123 also shows the results for Austria. Austria reaches its the best results within the scope of the equitability criterion, ranked 1st among the 11 countries observed, and regarding the adequacy criterion, ranked 4th. However, the overall results indicate that Austria might improve affordability and sustainability.

Figure 122: Leading countries criteria profiles – Sweden, Denmark, Netherlands

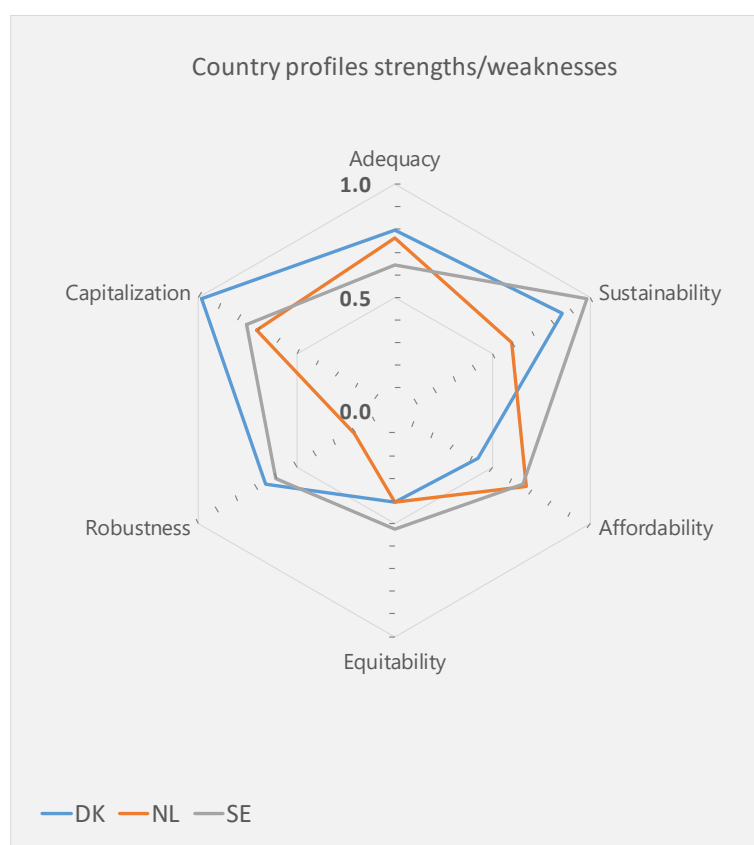
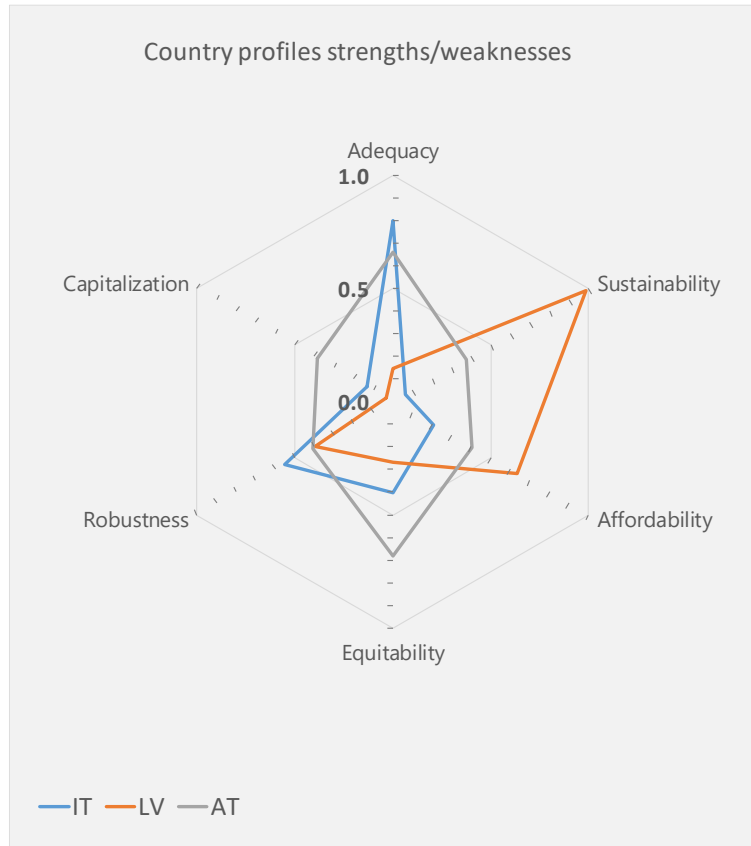


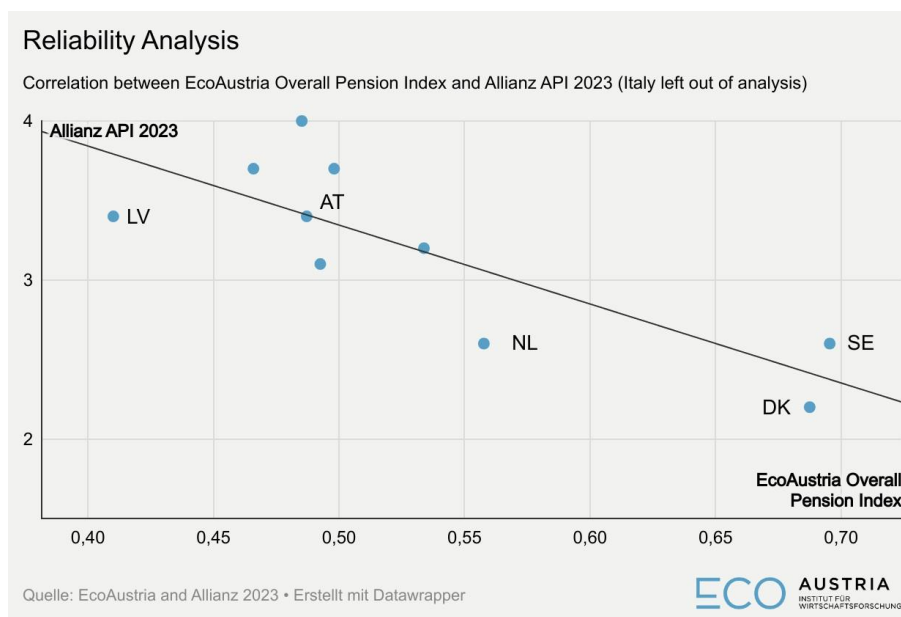
Figure 123: Catching up countries criteria profiles – Italy, Latvia, Austria



Reliability and plausibility

The plausibility of the total pension index developed can be tested by comparing results to an alternative index, published by Allianz (Allianz, 2023 or 2020). Like our approach, Allianz presented an assessment index for pension systems. The aim of the so-called Allianz Pension Index (API) is to assess two of the criteria, namely sustainability and adequacy. In this analysis, countries with smaller values score better. Similarly to a school grading system, smaller values stand for a better assessment. Thus, a negative coefficient is expected from the correlation analysis. The correlation analysis for the two indices gives an R^2 of 0.53. As expected, the coefficient is negative. A major deviation was found for Italy. Here, the results of the EcoAustria OPI are less favourable, considering weaknesses in long-term sustainability and in market capitalization. When Italy is left out of the statistical analysis the R^2 increases from 0.53 to 0.65 (Figure 124).

Figure 124: Reliability of overall pension index compared to Allianz Pension Index API

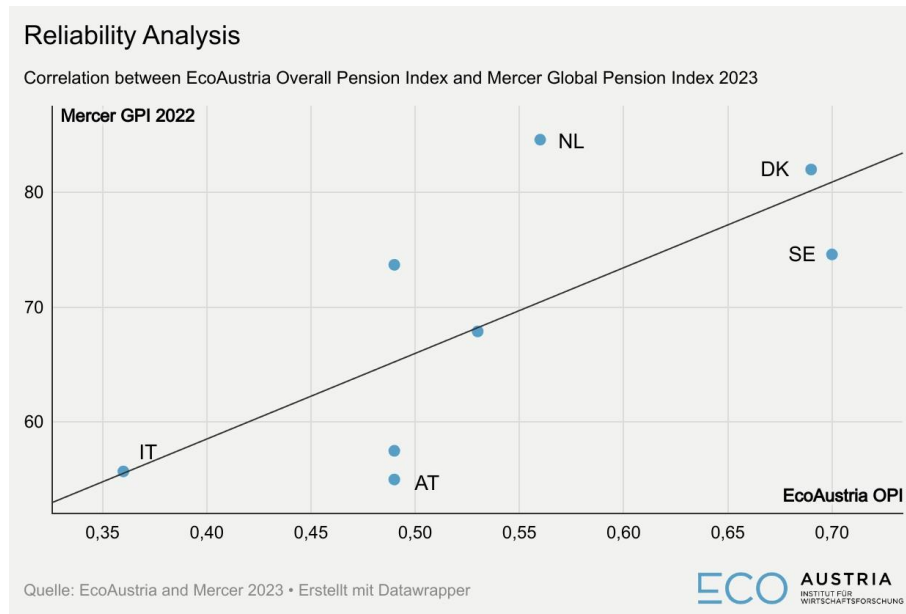


A second plausibility check is based on Mercer's Global Pension Index 2023. The Mercer CFA Institute Global Pension Index benchmarks 44 retirement income systems around the world.⁸⁵ The index is made up of three sub-indices – namely adequacy, sustainability, and integrity. The index measures each retirement income system by more than 50 indicators. A relevant drawback is that Mercer's Global Pension Index and EcoAustria's Overall Pension Index overlap for only 8 countries. These are Austria, Denmark, Germany, Italy, the Netherlands, Poland, Sweden, and the UK. Slovak Republic, Czech Republic and Latvia are not covered by the Mercer index. Apart from this shortfall, the results seem consistent with the EcoAustria index. The statistical analysis gives an overall R^2 of 0.52 (Figure 125).

Figure 125 shows the consistency between Mercer index and the EcoAustria index. However, a relevant deviation can be observed for Austria compared to Italy. Within the scope of the Mercer Index, Austria and Italy are almost equally tied for last place among the countries observed. From the perspective of the EcoAustria index, the equal ranking of these two countries seems somehow "surprising", especially regarding the sustainability criterion. The composition of the sustainability criterion in the EcoAustria index included the general government debt of the public sector and the sustainability gap based on the European Commission's S1 indicator. The rationale behind is that the general budget situation and the public debt ratio are essential financing conditions, especially for the funding of the public PAYG systems. The latter are of great importance for both countries. In terms of general government debt, however, but also regarding the sustainability gap, Italy has significantly worse conditions than Austria. Against this background, the equal assessment of Italy and Austria in the Mercer index does not seem fully comprehensible.

⁸⁵ Information on Mercer's Global Pension indexed is published on the website from Mercer under the [Weblink](#). Information in german language is published under the [Weblink](#).

Figure 125: Reliability of overall pension index compared to Mercer GPI 2023



Classification of pension systems

Based on typologies of welfare states originally introduced by Esping-Andersen (1990), typologies for classifying pension systems in Europe had been established. A useful classification typology is provided by Soede & Vrooman (2008) within the context of the EU-ENEPRI research framework. They differentiate four main types of pension systems: 1) the corporatist pension regime, 2) the liberal pension regime, 3) the modest pension regime and 4) the mandatory private pension regime.

Corporatist pension systems

Key elements of the first corporatist regime are that the systems are mainly provided and organised by public social security organisations and by the state. However, the historical genesis corresponds often to a form of institutional communisation and legalization of originally subsidiary, self-governing and initially non-governmental pension systems. The historical archetypes were organized at the level of companies, or they were managed by professional organizations and trade unions. The corporatist and self-governing origins are partially reflected in the governmental structures today. Notwithstanding these historical notes, public pension systems in corporatist pension regimes are ruled and organized by the state and public administration. Examples for corporatist regimes are Germany and Austria. From the 11 countries observed we would also assign Italy to the corporatist regimes.

For corporatist pension schemes there is a relatively high pension promise which is either fully or to a large part provided by the state within a PAYG-system. Funded pension savings are less important for corporatist regimes. The target replacement rate in the corporate schemes is relatively high compared to the countries from other clusters. Most of the schemes are earnings-related, despite a high relevance of redistributive elements limiting the difference or equivalency in pension wealth between low-earners and high-earners. As a result, the expenditure on pensions is relatively high in terms of GDP. Due to the financing mechanism these systems face

a high level of fiscal pressures from ageing societies. Furthermore, these countries often have special institutional arrangements, based on the length and steadiness of employment records, to provide pathways for early retirement. As a result, the labour market participation rates of the elderly and average exit ages from the labour market are both rather low. Older persons without any employment history rely on means-tested, social assistance and welfare related supplements (Soede & Vrooman 2008, p. 25).

Liberal pension systems

The second type comprises liberal regimes. Of our 11 countries considered, the UK belongs to this cluster. Soede & Vrooman assign the UK and Ireland, Canada and the USA to the liberal cluster. An essential feature compared to the corporatist regime is that liberal regime pension schemes are providing rather meagre pension benefits. Therefore, the functionality of pension systems in these countries has a strong emphasis on private, funded, and voluntary pensions.

As in the corporatist countries, the mandatory pension provision is fully carried out by the government, but at a more basic, universal, and minimum level. The pension provision is generally flat-rate and targeted to the provision of minimum income levels. As a result, low earners attain higher replacement rates than high earners within the scope of the statutory public pensions. In contrast to corporatist regimes, the pension age in the liberal systems is relatively high and early retirement arrangements are not the norm. This often results in rather high effective pension ages and labour participation rates.

Modest pension systems

A third type of pension regimes is classified as modest pension types. Often these systems have the characteristics of transitional welfare states and transitional economies that transformed into market economies after the end of the communist regimes. In this sense, "modest" systems can also be described as transitional pension systems. Among the 11 countries considered in this report, mainly the Czech Republic and the Slovak Republic are assigned to this cluster. Latvia is not considered by Soede and Vrooman but is most likely to belong to this cluster. By now, after recent pension reforms, also Poland can be assigned into the group of modest pension schemes. Soede and Vrooman grouped Poland into the group of mandatory funded pension systems, together with Sweden, Denmark, or the Netherlands. However, total assets in funded pensions relative to GDP are still low for Poland and the 2nd tier FDC-scheme is currently fading out.

For countries from this cluster the average pension benefit in the public mandatory scheme is modest, and the systems are run, organised and ruled by the government on a PAYG-basis, regardless of whether entitlements are calculated on the basis of defined benefits or notionally defined contributions like in Poland. The cluster is rather hybrid combining elements from the other types. Some characteristics are like those of the corporatist group, but pension levels are lower and retirement ages are higher, similar to the liberal regime types.

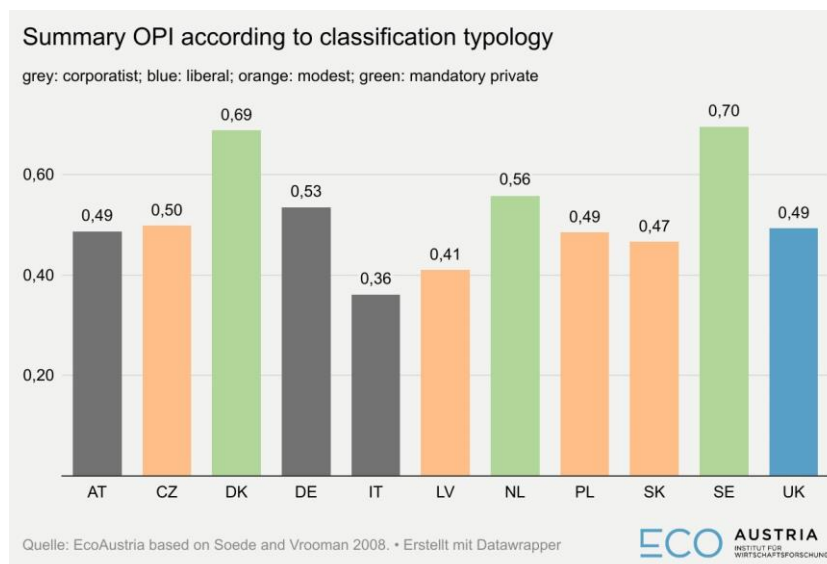
Mandatory funded pension systems

A fourth pension type comprises mandatory-private regimes. Denmark, Sweden, Netherlands, the latter at least partially, and initially also Poland, within the scope of the 1999 pension reform, had

been assigned to this cluster. For Poland a more “Scandinavian” type with elements of funded DC-schemes within the second tier had been introduced by 1999. However, with recent reforms the FDC-schemes had been abolished from the 2nd tier, with an option to transfer either transfer assets to voluntary plans in the 3rd tier or to the public NDC-based scheme, which is the main 2nd tier component. Beyond the 11 countries considered here, also Australia had been grouped as a mandatory funded regime. All countries with mandatory funded regimes have one or more private schemes in which employees are obliged to participate. Such schemes are generally funded and based on defined contributions. For the Netherlands two deviations are to be mentioned. First, occupational funded pensions in the Netherlands are regarded as quasi-mandatory. Neither are employers required by law to organize occupational pension plans, nor are employees obliged to organize funded plans for themselves. But the obligation to organise funded occupational plans for the employees is anchored in most of the industrial agreements. Consequently, most of the persons employed in the Netherlands, though not all of them, are covered by a funded occupational scheme. Second, despite the recent shift to more defined contribution schemes, defined benefit schemes are still far more important than defined contribution schemes.

The importance of the private and funded schemes differs within this cluster. In a similar way the total pension promise varies within this group. On average, the pension age and participation rates are rather high in these countries. The scope of the earnings-related pension system is often limited to the employees, whereas self-employed often need to organize their own pension insurance based on voluntary private plans.

Figure 126: Summary OPI in context of classification typology



Based on the literature on types of pension systems, the following typology emerges for the 11 countries.

- Corporatist regime: Germany, Austria, Italy.
- Liberal regime: United Kingdom.
- Modest regime: Czech Republic, Slovak Republic, Poland, Latvia.

- Funded mandatory: Denmark, Sweden, Netherlands.

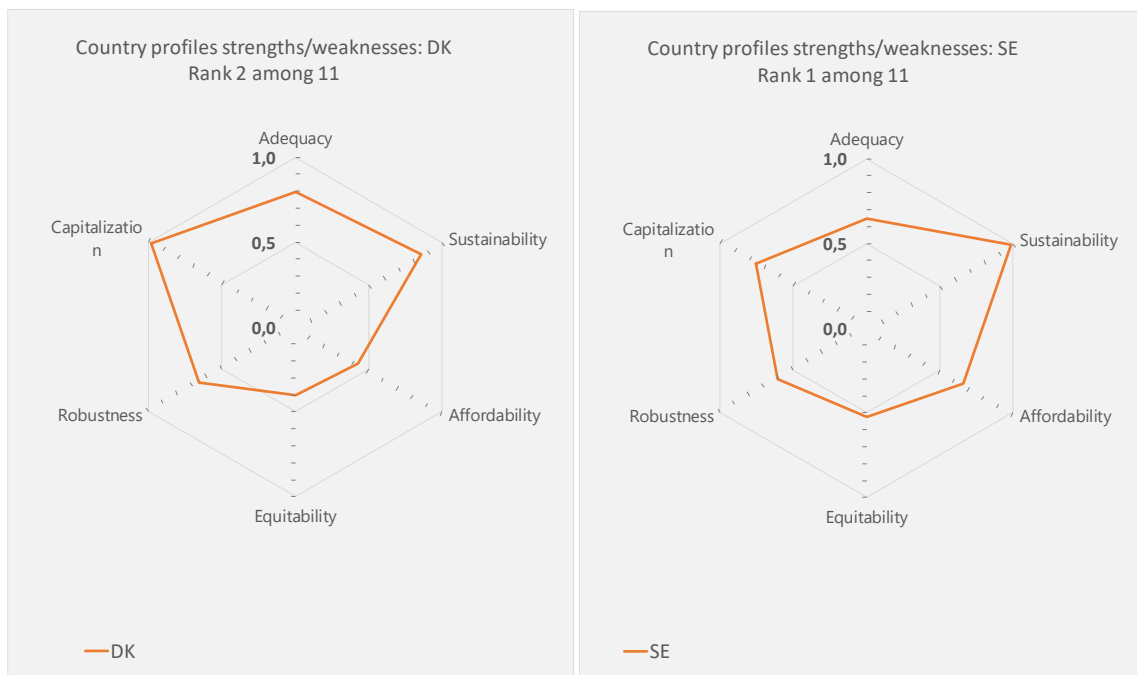
As shown in Figure 126, the best results from the Overall Pension Index OPI are calculated for the mandatory funded schemes Sweden, Denmark, and the Netherlands. UK as the only liberal regime is achieving a medium score. For the remaining types, no clear pattern is obvious at this stage. With “corporatist” Italy and “modest” Latvia two countries of different clusters show the weakest results. Their counterparts, Austria and Germany for the corporatist regimes, and Czechia, Slovakia, and Poland for the modest regimes, achieve medium scores like UK.

2.16. Lessons learned from the OPI Scoreboard Assessment

Lesson 1: The top ranked countries reach favourable results both in terms of “Adequacy” and “Sustainability”

The countries with the best results in the OPI Index, primarily Denmark, Sweden and the Netherlands, achieve good to very good results in the two important OPI criteria “Adequacy” and “Sustainability”. This is the first lesson from quantitative index analysis. The “best” pension systems guarantee both an adequate retirement income and sustainable financing. Denmark ranks 2nd regarding “Sustainability” and 3rd with regard to “Adequacy”. Sweden ranks 2nd regarding “Sustainability” and 5th with regard to “Adequacy” (Figure 127). The Netherlands ranks 3rd in “Adequacy” but lags slightly behind in sustainability. However, the Netherlands still has a medium score in “Adequacy”, ranking 7th.

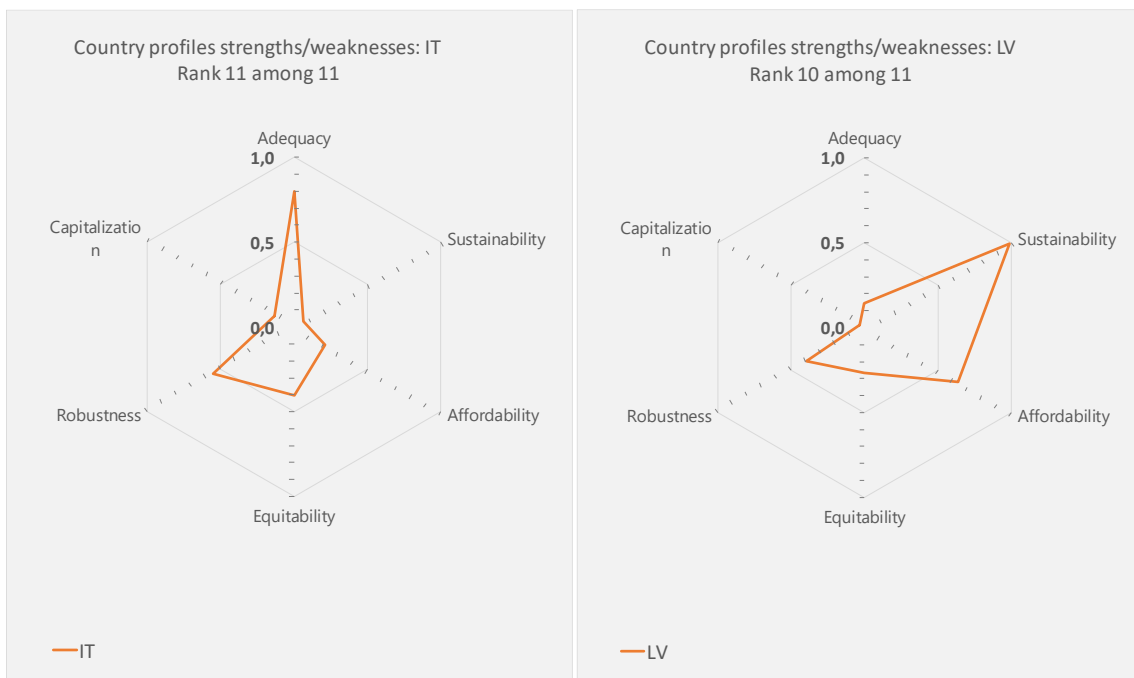
Figure 127: OPI Results for Denmark and Sweden



Lesson 2: The best-ranked countries resolve a trade-off between "Sustainability" and "Adequacy". This trade-off conflict is evident for all other countries observed.

The OPI basically show a negative correlation between "Adequacy" and "Sustainability". The results indicate a conflict of objectives between these two criteria dimensions. Two countries exemplify this conflict. Italy with top results for "Adequacy", but poor results for "Sustainability" and Latvia, conversely, with top results for "Sustainability", but poor results for "Adequacy" (Figure 128).

Figure 128: OPI Results for Italy and Latvia



The trade-off conflict is evident for all countries, "except" for the leading countries Sweden, Denmark and Netherlands. First, the scatterplot between the two criteria dimensions above all 11 countries yields a R^2 value 0.26 (Figure 129). The hypothesis of a negative correlation between "Sustainability" and "Adequacy" seems not "convincing", when all countries are taken into account. The main reason for this is, that the leading countries "offset" the trade-off relationship. After the tree leading countries are excluded from the analysis, the R^2 value increases to 0.8.

Figure 129: "Adequacy" and "Sustainability" – Statistical relationship with all countries observed

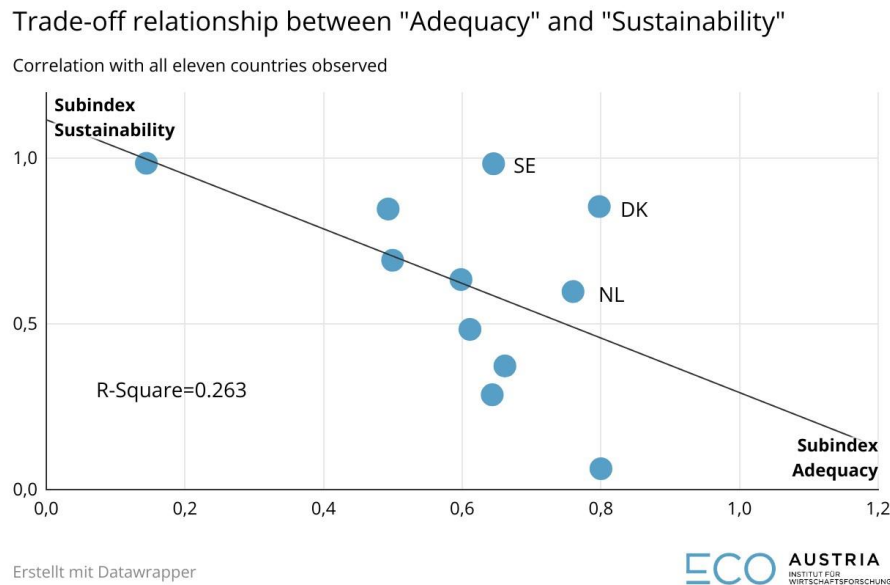
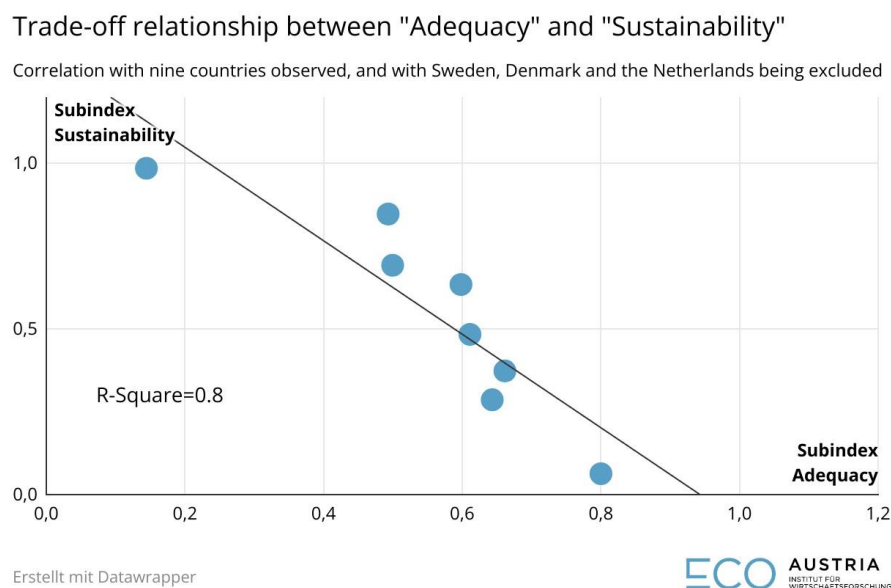


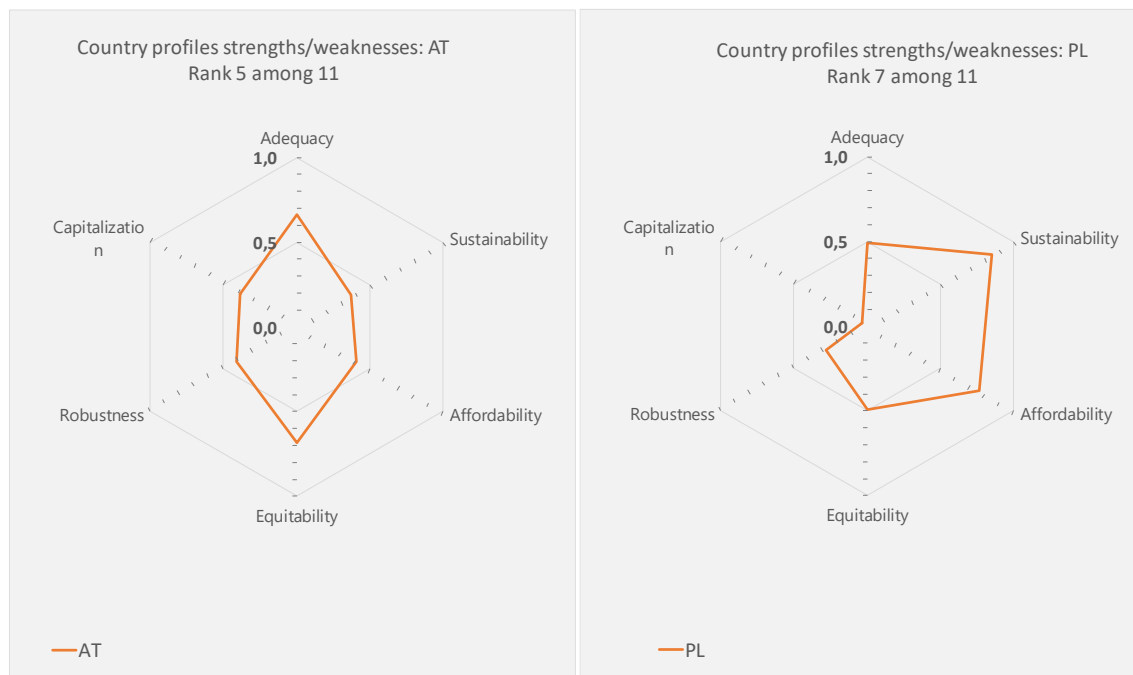
Figure 130: "Adequacy" and "Sustainability" – Statistical relationship with all countries observed



Lesson 3: Austria and Poland are identified as the "closest" or "nearest" counterparts to the extreme points of Italy and Latvia, respectively.

Despite better results overall, Austria appears to be comparable to Italy and Poland to Latvia in terms of the negative relationship between "Adequacy" and "Sustainability" (Figure 131). Similar to Italy, Austria ranks above the median value as regards "Sustainability" but achieves only weak results in terms of "Sustainability". Conversely and similar to Latvia, Poland reaches a good result in terms of "Sustainability" but ranks only in the middle of the countries observed with regard to "Adequacy" (Figure 131).

Figure 131: OPI Results for Austria and Poland



Lesson 4: Even the top-ranked countries are “not perfect”.

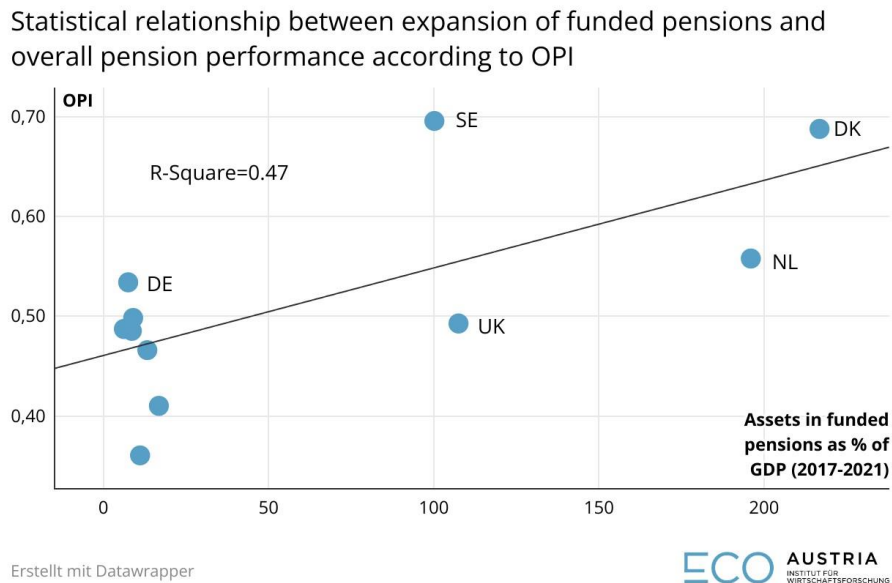
Despite their overall positive results, even the best performing countries face difficulties and challenges. No system is completely perfect. Sweden could do better in terms of adequacy. The Netherlands shows difficulties regarding the still prevailing DB systems and the financing of benefit promises. As mentioned in Section 2.9, the system of funded occupational pensions is currently shifting from DB to DC contracts. The Danish system appears expensive and has room for improvement in terms of robustness.

Lesson 5: However, well-developed funded components seem as one main driver for overall good results.

The three best-performing countries – Sweden, Denmark and the Netherlands – each have highly developed funded elements and components. The regression analysis – hereby, assets in funded pension plans as percentage of GDP (from 2017 to 2021) are statistically "explained" by OPI results for sustainability and adequacy – indicates a positive statistical relationship between the degree of expansion of funded elements and the results in terms of "sustainability" and "adequacy". However, the sample of 11 countries is rather small. The variation of countries in funded pension assets explains almost 50% of the variation in the OPI results (Figure 132). It suggests a positive relationship between the degree of expansion of funded pensions and the overall quality of the pension system.

The results indicate a statistical relationship between funded pension assets and the overall performance of pension systems. Conversely, the results do not appear to be due exclusively to funded pensions. This can be illustrated by the outliers Germany and the UK. As indicated in Figure 132, Germany achieves good results despite a low level of expansion, whereas the UK has highly developed funded pension components and continues to show only medium results.

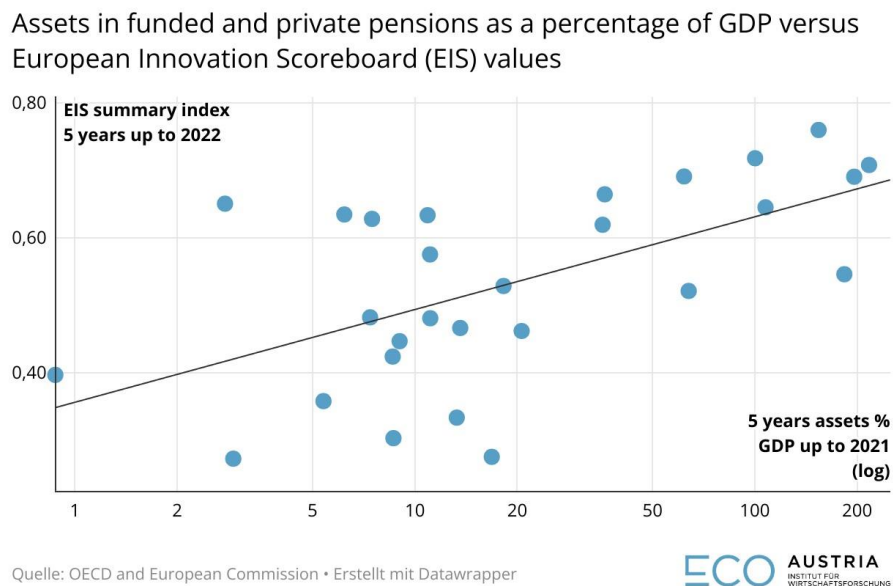
Figure 132: Statistical relationship between funded pension assets and overall OPI results



Lesson 6: The size of funded pension elements is a key driver for innovation.

The expansion of the funded component is in turn a driver for innovation and technological competitiveness. Countries with more developed funded components achieve better results in terms of the innovative capacity of their society and economy. The statistical relationship becomes evident, when we compare assets in funded pensions as percentage of GDP and the results in the European Innovation Scoreboard. This result has been already shown in Figure 108.

Figure 133: Assets in funded and private pension schemes as percentage of GDP (2017-2021) and country scores from the European Innovation Scoreboard (2018-2022)



3. Reforming pension systems: economic effects

3.1. Introduction and literature overview

The ageing of the population ('demographic ageing') has major consequences for economic development and social security systems in the different countries. Ageing is of special importance in countries which rely heavily on pay-as-you-go (PAYG) pension systems. Ageing implies less contributors to PAYG systems and more receivers of benefits leading to a gradually increasing gap in the financing of public pensions and weakening of sustainability of public finances. In many countries, reforms of the pension systems were implemented to dampen the impact of ageing. Reforms in the public PAYG systems reduce generosity, either by a lower pension replacement rate, a higher statutory and actual retirement rate or (more pronounced) deductions in case of early retirement. In addition, a funded second pillar was implemented in some countries to ensure enough resources during retirement.

Aside from income replacement a funded second pillar may also exert economic effects via several channels. Following Thomas and Spataro (2016), the implementation of pensions funds can influence job mobility between different employers, can have an impact on the retirement age, may increase the savings rate in the economy and foster capital market integration. Therefore, economic growth may also be influenced by the existence of a broad implementation of a second pension pillar based on pensions funds. The literature according to the potential effects is discussed in the following.

3.1.1. Pension funds and Labour Mobility

Pension funds provided by employers may restrict labour mobility of workers among different firms. This is caused by the design of pensions funds restricting pension claims in case of quitting the job. Such portability losses are mostly entailed in defined benefit (DB) schemes. Forteza (2010) summarizes several sources of restricted mobility. Vesting losses occur if a worker leaves a job before the end of the vesting period. Final wage losses occur, if the pension benefit depends on the wage at the time leaving the job and backloading losses if accrual rates of pension rights are low in the first years and rise with job maturity within a firm. Like for final wage losses quitting a job leads to lower pension rights. Penalty losses are associated with losses in case of transferring pension funds claims in a new scheme.

Earlier papers dealing with the question of job mobility restrictions find, that traditional pension funds with a defined benefit scheme restrict mobility of workers. Ippolito (1987) concludes that large capital losses in DB funds decrease turnover rates. Lazear and Moore (1988) argue that a DB scheme can lead to postponement of retirement to increase pension accrual. Allen et al. (1988) find that capital losses are associated with lower turnover rates, vesting losses and compensation premium have only limited impact on labour mobility. Ippolito (1991) shows that the potential loss due to DB schemes in the United States of quitting a job may amount to one year of earnings and rises tenure of workers aged 55 years by 20 percent.

Gustman and Steinmeier (1989) on the other hand find no difference between the impact of DB and defined contributions (DC) pension schemes. Both reduce mobility. The authors conclude, that decreased mobility is rather a result of efficiency wages than of pension backloading losses. Workers receive a compensation premium for reduced mobility. High monitoring and training costs induce firms to pay compensation premia to reduce monitoring or to claim benefits of higher productivity as a result of training.

Another argument that may influence the relationship between pension schemes and labour mobility is self-selection of employees. This means that workers may select jobs which fit best with their own preferences. Workers making long-term decisions may accept pension schemes with portability losses as they plan to stay within a firm for a longer time horizon. In this case workers self-select to certain jobs, leading to a positive relation between job maturity and portability losses of pension schemes. Allen et al. (1993) and Ippolito (2002) for the US and Disney and Emmerson (2002) and Andrietti (2004) for the UK show that self-selection can explain why workers with occupational plans have a more stable working career and a higher maturity within a firm.

Another reason for lower job mobility of workers with pension schemes can be the lack of good outside options. According to Thomas and Spataro, Fonte-Sante and Gouveia (2011) show that the lower mobility of pension-covered workers in Portugal is the result of low potential gains of job changes and not caused by portability losses of pension schemes. For Norway, Hernaes et al. (2011) also conclude that the consequence of portability loss in pension claims for job mobility is weak.

Differences in DB and DC pension schemes are also analysed in several papers. DC schemes tend to reduce mobility by (far) less than DB schemes. Lluberas (2008), Haverstick et al. (2010), Goda et al. (2013), Decressin et al. (2009) and Fang and Messacar (2019) find evidence for higher mobility if firms provide DC instead of DB pension schemes. There is also a shift from DB to DC plans in economies with firms providing pension schemes at a large scale. By 2015, more than 70 percent of pension members in the United States were in DC plans compared to about 30 percent in the late 1970s. In Canada, the relative importance of DB plans decreases as well (see Fang and Messacar, 2019). Lewis and Stoycheva (2016) analyse the effect of a change from DB plans to hybrid or DC plans for federal employees. They show, that the switch increased exit rates for federal employees in the late 30s to early 50s by one-third.

The literature implies that second-tier pension schemes and especially the design of schemes can reduce labour mobility of employees. The results are not consistent across the literature and self-selection may play an important role for the results. However, the literature implies that DB schemes may reduce job mobility, DC schemes seem to have a minor impact. In addition, it is not clear whether higher or lower job mobility should be preferred. In general, from an economic point of view labour mobility leads to more efficient matches between workers and high productive jobs. Non-portable pension claims can therefore be an obstacle for an efficient labour market. However, there may also be an inefficiently high number of quits in an economy. Investment in productivity-enhancing activities, such as training of workers and development of firm-specific skills, may be

too low if quits occur too often. In this case restrictions in portability can increase incentives to invest in such activities (see Thomas and Spataro, 2016).

With respect to the simulation within the framework of the study we abstract from influences of pension schemes on job mobility. We assume full portable DC pension schemes such that the impact, according to the literature, on mobility is rather modest.

3.1.2. Pension funds and retirement decision

Pension systems influence labour market decision especially with respect to the choice of the retirement age of workers. Public PAYG pension systems typically do not consider the life expectancy but only the contributions to the system and commonly include incentives for earlier retirement for distributional reasons. Often there exist rules for persons working in low-skilled jobs, being unemployed or disabled, or with longer insurance periods allowing them to retire earlier without actuarially fair deductions from pension benefits. This incentivises earlier retirement. Public pension systems regularly imply low participation rates for older workers. This follows from insufficient actuarial adjustment for later retirement, combined with generous replacement rates in the pension system and high taxation of labour income of older workers, see Gruber and Wise (1998). The authors also point to a high correlation between the implicit tax rate and early retirement.

Coile and Gruber (2000) argue that also pension fund schemes can exert influence on the choice about the retirement age. Whereas DC schemes based on actuarial adjustments of benefits provide incentives to postpone retirement compared to a public pension system, a DB pension often provides strong incentives to work to a particular age and disincentives to work beyond this age, like vesting, retirement windows and early and normal retirement bonuses. The retirement decision depends on the entire stream of future wealth accruals rather the level of wealth over the next year. Forward looking indicators, like the option or peak value, have a significant impact on the retirement decision. Keuschnigg (2005) shows that a funded pension system being a perfect substitute to private savings does not distort labour market decisions like the decision about the retirement age.

James and Edwards (2005) find that the pension reform in Chile to a fully funded DC system had a positive and significant effect on labour force participation of older workers. The authors attribute the increased labour supply of older workers to postponed pension age because of tighter early withdrawal pre-conditions, actuarial fair linkages between contributions and benefits, and increased incentives to continue working even if pensioned. Ni et al. (2009), based on data about Missouri teachers, show that in contrast to other systems DC benefit schemes delay retirement and smooth out the retirement pattern (peaks at certain ages).

Munnell et al. (2004) use HRS data, a sample of total population in the United States, to analyse the impact of the change from DB to DC pension fund schemes on the expected retirement age. They find that the incentive effects included in DB schemes compared to rather neutral DC schemes lead to an earlier expected retirement age of about 1.1 years. Manchester (2010) use a restricted dataset about college and university faculty and shows that self-selection in the different

schemes is important and distorts results if it is not controlled for. The author concludes that the incentive effect of a switch from a DB to a DC scheme amounts to 1.4 to 1.6 years of later retirement if not controlled for self-selection. After controlling, the effect reduces to 0.5 to 0.7 years of later retirement.

A move from a public PAYG pension scheme or even a DB funded pension scheme towards a DC scheme in the pure form removes labour market incentive distortions. Topping up an existing pension system by a DC scheme will therefore not add additional distortions to the labour market. According to Holzmann et al. (2019)⁸⁶ first it provides the strongest contribution-benefit link, reducing most or all implicit taxes and subsidies distortions. This should foster labour market participation and formal employment. Second, it implies a linear intertemporal budget constraint making the retirement decision smooth and eliminates clustering of retirement decisions. Retirement will be more in line with personal preferences. Third, a lower mandatory contribution rate should boost labour force participation and lead to a higher retirement age.

3.1.3. Funded systems and savings

The most important argument for a funded pension scheme is the rise in the national savings rate in the economy. Against the background of higher future deficits due to ageing of the population and/or lower replacement rates in the public pension systems, higher savings can absorb the problems of the predicted development to some extent. However, this only holds if saving in the economy rises. If the implementation of a funded system is only a substitute for other private savings, the saving rate might not change.

In addition, higher savings may stimulate economic development if funds are invested in the home country. The impact will therefore depend on a possible home bias of invested funds (see chapter 3.2.1). In this section we discuss only whether funded systems can boost the saving rate in the economy.

In the 1980s, two important programs were implemented in the United States. In the early 1980s, Individual Retirement Accounts (IRAs) were introduced and became available to all employees in 1982. Employees could contribute USD 2,000 per year, contributions were tax-deductible. The other program was the introduction of the 401(k) plan. The plan is EET, meaning that only withdrawals are taxed, and only available if firms offer such a plan. Venti and Wise (1995) use an ANOVA specification with individuals as their own controls to show that IRAs do not crowd out private savings and that saving is mostly additional savings. Gale and Scholz (1994) on the other hand conclude, that most of additional fund saving is crowded out by lower private and public savings. Neglecting persons with IRA savings older than 59 they find that, if all (half) of the tax cut were saved, 35 percent (20 percent) of the increase in IRA contributions represent new saving.

As the 401(k) program became more and more important, the effectiveness of the program with respect to savings was analysed. Poterba et al. (1995) find positive effects of 401(k) plans on private savings with only little evidence of crowding out other forms of personal savings. The

⁸⁶ Holzmann et al. relate their conclusions to nonfinancial defined contribution (NDC) schemes. Their arguments clearly are also valid for DC systems.

authors compare savings of families eligible for 401(k) with families not eligible (as employers do not provide the possibility of contributions) and the change of assets of contributors over time. Engen et al. (1994) on the other hand find a large effect of crowding out by modelling savings behaviour and comparing wealth effects of savers with non-savers in 401(k) plans. However, the model implies that the contributions of low-income households are predominantly new savings. The different conclusions of the two papers may be the result of unobserved heterogeneity in household saving and a high correlation with measurement errors of self-reported eligibility for 401(k) plans and savings (Engelhardt, 2000). Engelhardt uses self-reported and firm data and concludes that the plan leads to economically large and sometimes statistically significant household saving effects of 70 cents to one dollar for each contributed dollar for lower-to-middle income households. Benjamin (2003) and Engelhardt and Kumar (2011) finds a qualitatively similar result of higher additional savings for households with lower income.

Based on the literature one can conclude, that both pension fund schemes in the United States increased savings of low- and middle-income households while there may be significant crowding out for high-skilled (high-income) households. However, both schemes were voluntary such that substitutional effects may be pronounced.

Schmidt-Hebbel (1998), Morande (1998), and Coronado (2002) analyse the pension reform in Chile with mandatory contributions to a funded pension scheme. They conclude that national savings increased due to the reform. Schmidt-Hebbel distinguishes several scenarios to estimate crowding out and finds crowding out of 67 percent in the scenario with small effects, no-crowding out in the moderate effect scenario to crowding-in of about 50 percent in the large effect scenario. Morande uses a vector error correction model and concludes that compulsory savings due to the pension reform towards a funded system led to a crowding out of private savings of 50 percent. According to Coronado, the switch from a PAYG to a funded system increased household saving rates by 5 to 10 percentage points.

Chetty et al. (2014) use Danish data to show that tax subsidies which rely upon individuals to take action to raise savings have small impacts on wealth. Each dollar tax expenditure increases total savings by 1 cent. In contrast, policies that raise retirement contributions by no actions (automatic employer contributions for example) raise pension wealth substantially. According to the authors, 85 percent of individuals are passive savers and automatic contributions are more effective than tax subsidies. Yang (2016) analysis a reform in Taiwan that has mandated that all private sector employers contribute to employee's individual pension accounts. The author estimates a crowding-out of other private saving of about 50 to 60 percent. Lachowska and Myck (2018) study Poland's 1999 pension reform based on the Household Budget Survey. They show that one PLN less of pension wealth increases household saving by 0.3 PLN. Among highly educated, pension wealth and private saving appear to be close substitutes.

Another strand of the literature uses panel data. Bailliu and Reisen (1998) use a sample of 10 countries for the years 1982 to 1993. They find that the impact of pension funds on national savings differs between OECD and non-OECD countries. They find a statistically positive impact for non-OECD countries but not for the OECD countries. Reasons are borrowing constraints for most pension savers and the mandatory status of the funded pension schemes in the non-OECD

countries. Bosworth and Burtless (2004) use data about 11 OECD countries, Murphy and Musalem (2004) from 43 countries and Rezk et al. (2009) from six Latin-American countries. The authors argue that the voluntary decision to participate in a funded system leads to crowding-out of other private savings.

From the results of literature about pension fund contributions and private savings one can conclude, that crowding-out of private savings can play an important role. It is of special importance in case of voluntary contributions and for persons with higher income or wealth. On the other hand, for mandatory contributions to pension funds and for lower- and medium income households there seems to be nearly no crowding-out. Overall, crowding-out for mandatory contributions may amount to about half of assets invested in private pension funds.

3.1.4. Funded systems and growth

Several studies analyse the link between funded pensions and economic growth. The evidence is mixed, as also Thomas and Spataro (2016) point out in their literature review. In the early literature, several studies analysed the pension reform in Chile in 1981 (a shift from an unfunded to a funded scheme) and from them it can be concluded that the reform had a positive effect on economic growth. For instance, Holzmann (1997) estimated, using OLS, the Solow residual specification of total factor productivity (TFP) and found a contribution of the reform to GDP between 1 percent and 2.9 percent. Similarly, a positive but slightly lower effect was estimated by Schmidt-Hebbel (1998), placing the contribution of Chile's pension reform to economic growth in the range of 0.4 percent to 1.4 percent.

Some broader literature, covering several countries, also found positive effects on growth. For example, Morina and Grima (2021) analysed OECD country data through regression analysis and found that a 1 percent increase in public pension funds led to a 0.004 percent increase of GDP. Hu (2005) found evidence for a significant positive link between pension assets and GDP growth in both developing and developed countries using contemporaneous regression and Granger-causality tests across data from 38 countries. Yilmaz and Ozturk (2016) found a bilateral causality between the value of pension funds and GDP for 26 OECD countries, hence suggesting that a higher value of pension funds leads to GDP growth, and the other way around. Davis and Hu (2008) found by studying data of 38 countries that an increasing ratio of pension assets to GDP significantly affects output per capita, with larger effects in liquidity-constrained developing economies. Hence, in general, several studies empirically confirm the theoretical prediction that a funded pension system would increase economic growth.

Nevertheless, some studies didn't find clear significant evidence. Zandberg and Spierdijk (2013) state that Davis and Hu (2008) use the wrong proxy for pension assets. They argue that the ratio of pension assets to GDP should be controlled by the rate of return from the capital market, as an increase in pension assets by capital market gains would not reflect the change in the degree of funding. By doing so, and using data of 54 countries from 2001 to 2010, Zandberg and Spierdijk found mixed results regarding the direct relationship between funded pensions and economic growth. They found no significant short-term effect in a cross-country regression. In the long run, they found significant results only when using a model with overlapping observations and not

excluding outliers. In that case, a 10 percentage point increase in the funding ratio would increase the average economic growth rate by 0.18 percentage points in the four years following the change. The study of Davis and Hu (2008) also got criticized by Carmeci et al. (2020), who argue that the specification is not econometrically robust, as the regression residuals across countries are correlated. By re-estimating the model, with a broader definition of pension assets and correcting for the misspecification, Carmeci et al. do not find significant effects. However, it's worth noting that Carmeci et al. use different data and a smaller sample of countries than Davis and Hu due to data availability issues. Davis (2004) did not find a significant effect while studying the linkage between institutional investors' size and economic growth across 17 OECD countries.⁸⁷ Altiparmakov and Nedeljkovic (2018) applied several econometric specifications to data from Latin America and Europe and also do not observe any significant effects of pension privatization on higher economic growth. They argued that the design of the scheme (mandatory or voluntary) and portfolio allocation of the funding play important roles, with significantly lower impacts on growth in countries where the share of government bonds exceeded 50 percent.

Bijlsma et al. (2018) argue that direct estimations of the impact of pension funds on economic growth typically lag due to endogeneity and causality issues, as well as the limited number of observations (e.g. the number of countries). Hence, they analyse the differential impact of pension savings on firms that rely more or less on external financing. While it is just a differential estimation, and hence aggregating the effect on the whole economy is problematic, it serves as an indication of the potential effects of pension funds. They argue that a deeper and more efficient capital market should be especially beneficial for firms with higher external market dependency. Using data from 69 sectors across 34 countries from 2001 to 2010, they found a significant positive effect of pension assets on the growth of sectors which are more reliant on external financing. They conclude that a 40 percentage point increase in pension assets relative to GDP would increase the growth rate of sectors with an average external financing ratio by 0.24 percentage points.

In conclusion, evidence regarding the direct link between funded pension systems and growth is mixed due to different model specifications and estimation methods. Nevertheless, several studies find a significant positive relationship.

3.1.5. Key lessons from the literature analysis

- Ageing of the population leads to a decline in future public pension benefits to maintain sustainability of public finances.
- A strong expansion of funded pension systems can reduce the gap in future PAYG pension benefits and leads to a higher saving rate in the economy.
- Pension funds crowd out private savings to some extent. However, empirical results show that about half of second pillar savings are additional savings. Especially for low- and medium-income households there seems to be no crowding-out, increasing funds of

⁸⁷ In the study the institutional investor size is measured by the institutional assets in relation to GDP. Institutional investors also include insurance companies and mutual funds and hence not solely test for the effects of pension funds.

these households during retirement. This is of special relevance if the replacement rate of public pension system decreases.

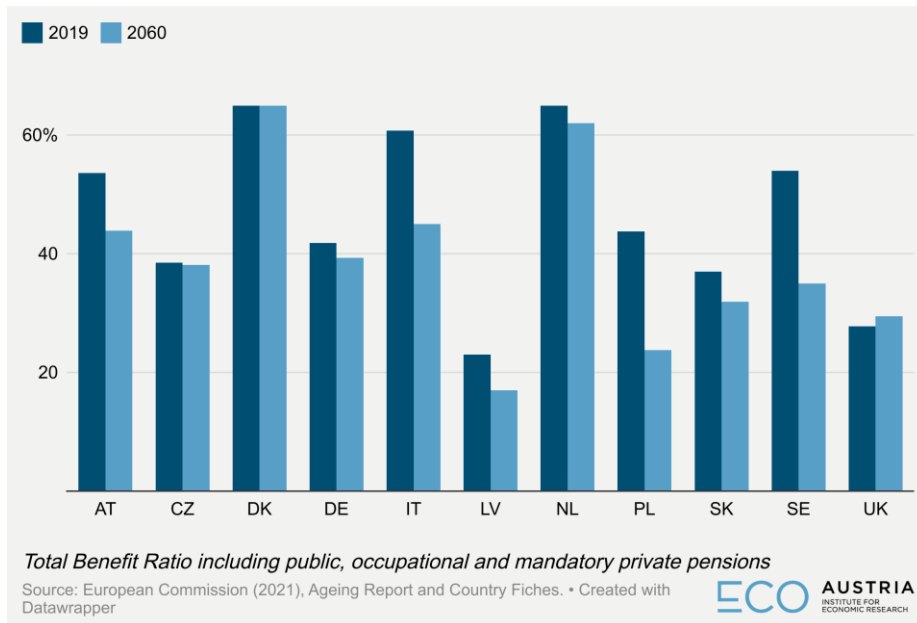
- Optimally, pension funds do not distort labour market decisions. Neither do they restrict labour mobility nor influence the decision about the retirement age. Therefore, pension fund assets should be perfectly mobile with no losses of pension claims in case of changing jobs and deductions in case of early retirement should be actuarially fair. Both can be best achieved, if pension funds are implemented by a DC scheme. An actuarially fair DC scheme reduces early retirement incentives inherent in public pension systems.
- In addition, an extension of pension funds can boost economic growth. It increases capital supply especially for firms relying on external financing. Although there are incentives for the government to implement regulations in favour of providing capital supply especially in the domestic capital market, pension funds and insured persons should be responsible for how assets are invested. This increases the return on investment taking into account the risk aversion of the insured.

3.2. Background, Scenario and Simulation results of funded pension systems in selected countries

When confronted with demographic ageing, many European societies have reformed their (public) pension systems in order to increase fiscal sustainability. Accordingly, benefit ratios (i.e. the ratio of the average pension benefit relative to the average wage) will decline in the future. Figure 134 depicts the total benefit ratio, i.e. including public, occupational and mandatory private pensions, in the eleven investigated countries in 2019 and 2060 according to European Commission 2021 Ageing Report (EU – EU Commission 2021). The reduction is particularly strong in Poland, Sweden and Italy and pronounced in Austria, Latvia and Slovakia. While the decline is moderate in the Netherlands and Germany, only few countries (the Czech Republic, Denmark and the United Kingdom) feature relatively constant benefit ratios.⁸⁸

⁸⁸ In Latvia and the United Kingdom, poverty rates of people aged 65 years and above are i) significantly higher than the OECD average and ii) significantly higher than that of the working age population in the respective countries. Thus, provision of higher pension benefits would help reducing poverty rates of elderly people.

Figure 134: Total Benefit Ratio, 2019 and 2060

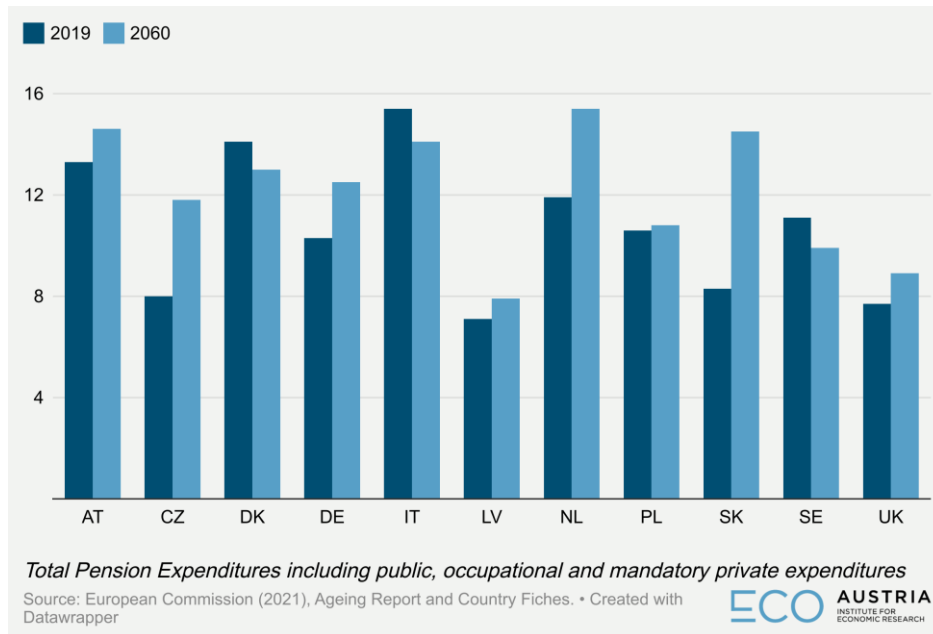


Apart from demographic changes that increase the old-age dependency ratio (i.e. the relation of elderly people to the working age population) and changes of pension benefits, pension expenditures are determined by the effective retirement age. Among the countries analysed in this report, the exit age from the labour market is projected to increase pronouncedly in Denmark (by 4.2 years from 64.5 years in 2019 to 68.7 in 2060), Italy (by 2.8 years from 65.5 to 68.3) and in the Netherlands (by 2.4 years from 64.9 to 67.3).⁸⁹ Ceteris paribus, this reduces pension expenditures as the number of pensioners declines.

Despite lower pension benefits and a higher projected effective retirement age, total pension expenditures (i.e. including public, occupational and private mandatory pensions) are projected to rise in many European countries. According to the Ageing Report, the expenditure increase is particularly strong in Slovakia, the Czech Republic and the Netherlands, see Figure 135. Additional reforms might be necessary to improve fiscal sustainability in these countries.

⁸⁹ In Denmark, for instance, the increase of the exit age from the labour market is related to the 2006 and the 2011 reform of the Danish pension system that introduced an indexation mechanism such that the retirement age increases with life expectancy for a 60-year old. This is intended to ensure that 'every generation can expect approximately the same number of years in retirement' (see Ministry of Finance, 2020).

Figure 135: Total Pension Expenditures, 2019 and 2060, in percent of GDP



To sum up, at least one and in most countries several of the following statements are true for the investigated countries:

- i. elderly people will face less generous pension benefits than previous generations;
- ii. elderly people are already confronted with above-average poverty rates;
- iii. the statutory retirement age is increasing;
- iv. European societies will face a pronounced increase of pension expenditures which might require further pension reforms.

Higher contributions to funded pension systems could i) cushion less generous future pension benefits, ii) reduce old-age poverty rates, iii) ease the transition phase from employment to retirement and iv) cushion possible future pension cuts. Accordingly, we investigate economic effects of more pronounced funded pension systems in the different countries. This is a way to overcome problems of pension systems for example with respect to generosity in the countries to some extent.

Starting point for the simulation is the observation of high diversity of the stock of total assets in funded and private pension plans. Across the OECD countries, the share of total assets in percent of GDP amounts to about 105 percent of GDP in 2021. On the one hand, in Denmark and the Netherlands total assets already amount to 233 and 213 percent of GDP as pension funds play a significant role in financing pension replacement income. In the UK, pension funds amount to about 120 percent and are therefore higher than the OECD-average but considerably lower than in Denmark and the Netherlands. On the other hand, pensions funds play a minor role in financing pensions in the other eight selected countries. In Austria, for instance the share amounts to 6.7 percent in 2021, in Germany to 8 percent.

3.2.1. Description of the reform scenario

For the simulation of the impact of an extension of the funded pension system, we assume that a share of 3 percent of gross income is invested in pension funds for countries different from Denmark and the Netherlands. For this reason, in the analysis only employed persons contribute to funds. Initially only persons younger than 55 years start contributing. Persons aged 55 or older in the year 2024 (i.e. those born before 1970) do not participate in the new system. However, future older workers contribute as younger workers will grow older. The additional stock of pension funds, as presented in the simulation results below, would significantly decrease the deviation of these countries towards the OECD-average over time. For the UK, the scenario would imply that the deviation towards Denmark and the Netherlands would decline significantly in a longer perspective. Moreover, the simulation abstracts from obstacles to labour mobility. According to the results in the empirical literature, see section 3.1.1, this implies that the pension fund is organised as a DC pension scheme.

Taxation of contributions, investment returns and benefits

Taxation of contributions, investment returns and withdrawals to and of funded pension systems differs between countries. In some countries, like in Denmark, contributions are taxed by the income tax, in other countries they are exempted. As discussed above, an EET system is implemented in many European countries. In this case, contributions and returns are exempted from taxation, withdrawals in case of retirement are taxed. In such a system taxation is deferred from working age towards retirement. A complete exemption from taxation can be found in the Slovak Republic and in Estonia.

For the simulation we assume that contributions to the funded systems are tax exempt with respect to the income tax. In addition, also returns on investment are exempted and pension payments are fully taxed. This implies that we implement an EET system, which is already established in many countries. For the different countries the same taxation regime is applied to increase comparability of the results between them.

Investment share in domestic markets – Home Bias

An essential part of the economic effects of a more pronounced role of funded pension systems in the following model simulations is the larger amount of assets, which provides additional investment funding to the economy. There is a large amount of empirical evidence for the 'home bias', i.e. the fact that private and institutional investors usually hold a disproportionately high share of domestic assets in their portfolio, see for instance Lewis (1999), Karolyi and Stulz (2003) and Cooper et al. (2012) for a literature survey. This is in line with OECD data on pension funds. Among the European countries listed there, the share of assets in funded and private pension plans invested at home ranges widely (the share is 10 to 20 percent in Latvia, the Netherlands, Lithuania, Slovakia, Portugal and Estonia and 80 to 90 percent in Hungary, Sweden, the United Kingdom, the Czech Republic and Poland). These numbers imply a pronounced home bias for each of the countries.

Chan et al. (2005) investigate the (determinants of) home bias for 26 countries. They find that there is a home bias in all investigated countries and that, among six categories of possible

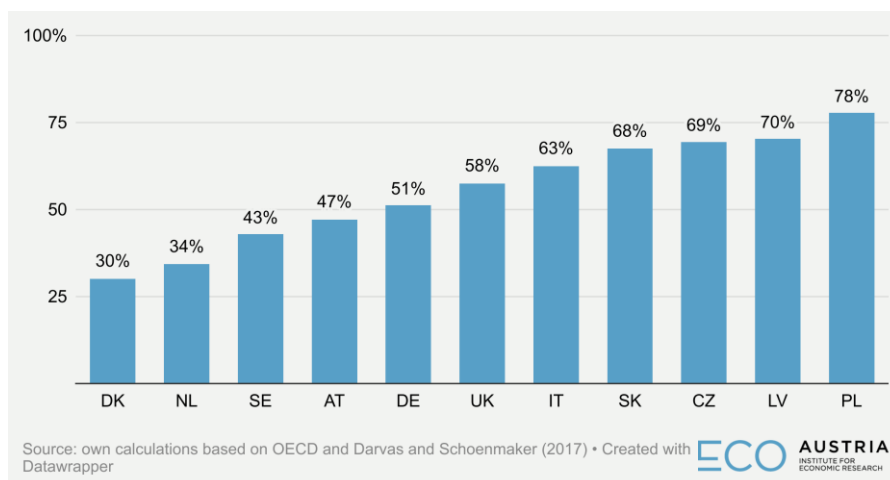
determinants of the bias, the 'stock market development' (measured e.g. by stock market capitalisation and the turnover ratio) has the highest explanatory power for the home bias. More recently, Darvas and Schoenmaker (2017), applying panel regression estimates for 25 countries, find that the home bias is smaller the larger the assets managed by institutional investors. In addition, higher GDP per capita (indicating a countries' level of development), the size of the home market (measured by market capitalisation) and stronger pension funds' investment restrictions are positively associated with home bias, while greater trade openness is negatively associated with home bias. In addition, euro zone membership increases investment in other euro area countries and, thus, is found to reduce the home bias. Molestina Vivar et al. (2020) find that traditional estimates of the home bias, that are based on the investment fund's domicile rather than the investors' country of origin, may be biased upwards because of the existence of large financial centres in the European Union such as Ireland and Luxembourg. In addition, the home bias has declined in recent decades due to stronger capital market integration.

For our simulation analysis, the share of pension funds' assets that is invested domestically, is derived from a combination of OECD data and the Darvas and Schoenmaker (2017) estimates. More precisely, we first calculate an average share of domestic investments (weighted by the amount of assets in pension plans) based on OECD data. As a second step, we derive deviations from this average for the 11 modelled countries by applying the Darvas and Schoenmaker estimates. This means that we are taking into account total assets in pension plans, GDP per capita, exports of goods and services, home and foreign market capitalisation⁹⁰ and euro area membership of each of the countries to calculate the share of assets invested in the domestic market.

Based on this method, we find that the share of assets that is invested domestically (for those assets that are additionally 'created') ranges from 30 and 34 percent in Denmark and the Netherlands to 78 percent in Poland. To a large extent, these numbers are in line with the dispersion of OECD's share of assets invested domestically and they are also consistent with European Commission (2021b) who find that the bias is higher in larger CEE Member States and countries that are not members of the euro-area.

⁹⁰ This calculation is based on OECD's total assets in funded and private pension plans and the share of these assets invested abroad, the AMECO database and World Bank's market capitalization of listed domestic companies.

Figure 136: Share of assets invested domestically (for additional pension funds' assets)



In addition to estimates on the home bias, Darvas and Schoenmaker (2017) provide estimates on the euro area bias in their Table 3 for four groups of countries⁹¹ and Figure 9 and Figure 10 for individual countries. In order to derive a number for assets invested within the EU for our EU-27-scenario, we i) use these euro area bias estimates for the individual countries, ii) increase these numbers for the home bias of Non-Euro countries and iii) top up these numbers by the share of EU-but-non-Euro-countries according to World Bank's market capitalization. For each individual country, this method results in a share of assets invested within the EU. As we take a weighted average of these shares⁹², we derive a number that can provide us with a proxy for the EU-wide share of assets (for the assets that are newly 'created') that are invested within the EU. According to this approach, this share might amount to 72 %.

Pension funds and Provision of Private Equity Capital

According to the empirical literature, the provision of private equity leads to real effects on the economy in addition to its impact on financial markets. Private equity reduces restrictions concerning the access to capital, which are a consequence of higher business risks and information asymmetries between a company and the investor. In addition, investors provide Know-How and has an interest to monitor the investment more efficiently than other types of investors. According to the literature, research and development expenditures as well as innovative patents are higher in case of a private equity participation.

Funded pension systems are a possible source for private equity financing. Given the financial backing it can invest in firms with riskier prospects to some extent. Relating total assets in funded and private pension plans to investment in private equity capital provides a positive relationship between them, as shown in Figure 137. A higher amount of funded and private pension plans seems to boost the supply of private equity capital. However, the additional amount of supply diminishes with the size of available pension funds, which is reflected in the logarithm of the size of pension funds. An OLS-estimation shows that an increase of the share of funded pension

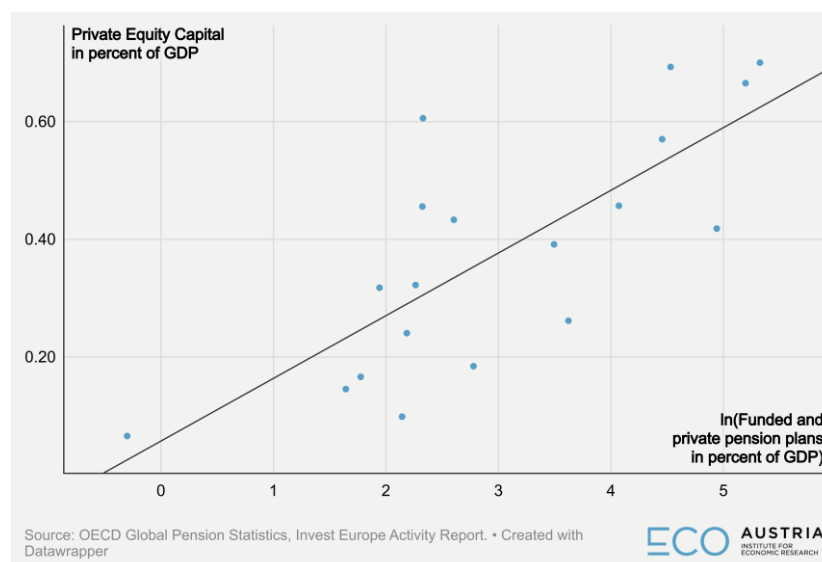
⁹¹ Euro-area countries, Old EU 3 (DK, SE and UK), New EU 5 (BG, CZ, HU, PL and RO) and Advanced 4 (CA, IL, JP and US).

⁹² We take GDP of these countries as a proxy for the contributions amounting to 3 percent of income.

assets on GDP by 100 percentage points is associated with higher private equity capital by about 0.3 percent of GDP for countries with an initially low share of funded pension assets. For countries with an initially higher share the impact is considerably lower.

For the implementation of the impact of private equity funds on the economy we rely on Chemmanur et al. (2011) and Amess, Stiebale, and Wright (2015). Chemmanur et al. investigate the impact of Venture Capital on the total factor productivity of backed firms. Amess, Stiebale, and Wright provide results for the impact of Buyout-Investments on the innovation of backed firms.⁹³ The larger share of private equity capital is provided as Buyout-Investments with about 85 percent of investments. The share of Venture Capital on the other hand is about 15 percent of total private equity investments. Data show only a small negative relation between the total Private Equity Capital and the share of Venture Capital. For this reason, we assume a constant share in the simulation.

Figure 137: Relation between Private Equity and Funded and Private Pension Plans



3.2.2. Key lessons from the reform scenario

- According to the estimates, either the future benefit ratio will decline or total public pension expenditures will increase significantly in the medium- and long-run in most of the considered countries. An extension of a funded pension system can counteract declining pensions in the future.
- An important aspect of the attractiveness of a funded system is the design of taxation. Taxation of contributions, investment returns and/or benefits decrease the return and decrease future pension benefits.
- An EEE system would lead to the highest pension benefits but would decrease public revenues as contributions are tax exempt

⁹³ The transformation of innovation in total factor productivity follows Yildiran (2020).

- An EET system is like the taxation of the public pension system in Austria and many other countries, in which contributions paid are tax deductible and benefits taxed by the income tax. In general, such a system is preferable as the marginal tax rate is typically higher during the working age compared to retirement.
- An important channel for additional economic growth and capital supply in a country is the home bias of investment of pension funds. According to data, the home bias can be considerably. It increases with the size of the country but declines with the amount invested by pension funds. In countries with an already high share of pension funds assets the home bias decreases significantly. This can be motivated by decreasing returns to investment as pension funds assets rise.
- Furthermore, the large stock of managed capital allows pension funds to invest in riskier assets. Data show a correlation between capital invested in pension funds and capital invested in private equity. Therefore, pension funds also provide capital supply for enterprises with high risk but also the chance for high returns.

3.2.3. EU27 and single country simulation results

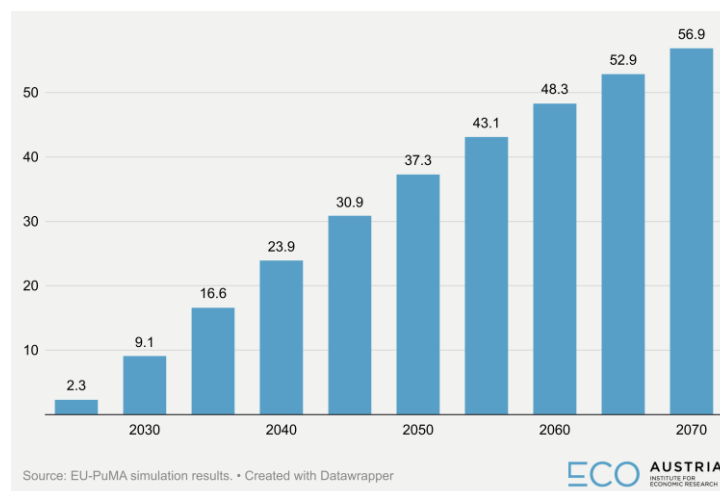
Macroeconomic impact of an EU-27-wide reform

We start the discussion of the economic impact of a more pronounced role of funded pension systems in Europe for the aggregate EU-27-model, and then proceed with individual country results. As discussed above, we assume that the additional contribution rate to funded pension systems amounts to 3 percent of gross income in each of the 27 EU Member States.

The stock of additional assets in funded pension plans gradually builds up. In addition to the contributions paid, the return on investment of the accumulated assets add to the stock of assets, whereas benefits are deducted during the pay-out-phase. According to the EU-27-model results, the stock of additional assets in funded pension plans, which is illustrated in Figure 138, amounts to 9 percent of EU-27-GDP in 2030, 24 percent in 2040 and reaches 57 percent of GDP in 2070.⁹⁴ In 2022 prices, these numbers amount to 3,800 bn. euro in 2040 and 9,100 bn. euro in 2070.

⁹⁴ The reform scenario simulation deviates from the base scenario simulation only with respect to the implementation of the reform scenario. Thus, the difference between these two simulation results can be interpreted as causal effects of the policy reform. The results illustrated in the following figures and tables are to be interpreted as level effects. For instance, in 2040, assets in funded pension systems in the reform scenario are 24 percent of GDP higher than in the base scenario.

Figure 138: Increase of assets in funded pension plans in the EU-27-model, in percent of GDP, 2025-2070



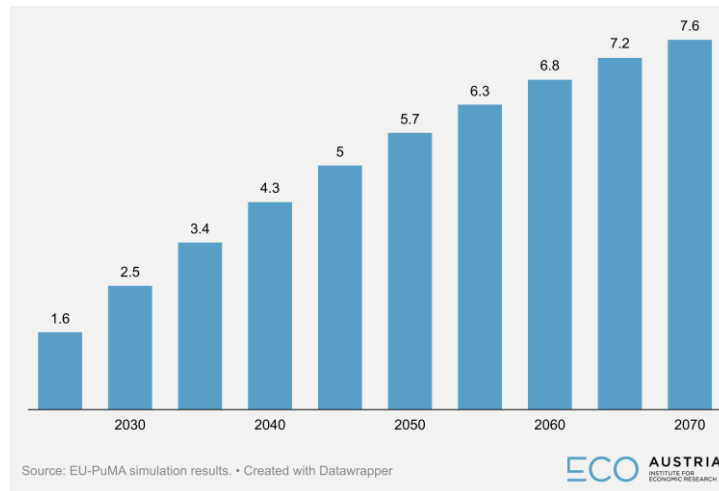
As already discussed in chapter 3.1.3, theoretical and empirical evidence suggests that an implementation of funded pension systems crowds out private savings to some extent. Thus, the increase of country-wide savings is less pronounced than the increase of assets in funded pension plans. In addition to that, the model analysis considers the home bias of pension plan investment as discussed in chapter 3.2.1. Still, a significant share of funded pension assets is invested in the home country. This provides companies with funding for their investment and implies that the capital stock raises significantly as a result of the implementation of funded assets.

Note that, according to chapter 3.2.1, the share of assets invested 'domestically' is 72 percent and thus significantly higher for the EU-27-model as for the average of the individual countries analysed. This results from the fact, that a cross-country investment within the EU is, by definition, a 'domestic' investment in the EU-27-model, while it is an investment in a foreign country in the individual country simulations.⁹⁵ Thus, the implementation of a funded pension system analysed has more pronounced effects in the EU-27-model than on average of the individual country models.

The impact of the implementation of funded pensions on private investment in the EU-27-model is illustrated in Figure 139. According to the model simulation, it amounts to 2.5 percent in 2030, 4.3 percent in 2040 and 7.6 percent in 2070. The rising impact of the policy scenario on investment is, inter alia, caused by the fact that not solely contributions paid lead to higher investment. In addition to that, the return on the investments are re-invested.

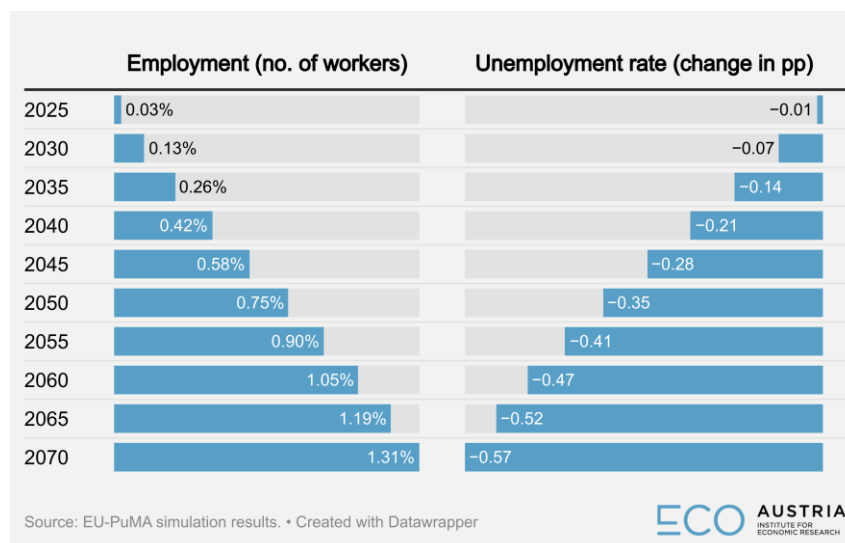
⁹⁵ For instance, if assets of a German pension plan are invested in Denmark, they are a 'domestic' investment in the EU-27-model, but not in the Germany-model.

Figure 139: Change of investment in the EU-27-model, in percent, 2025-2070



From an economic point of view, the increase of physical investment results in a higher capital stock, which in turn boosts the capital-labour-ratio and capital endowment of the employed. Thus, labour productivity rises so that firms increase labour demand. According to the simulation scenario, the implementation of funded pension plans boosts employment by 0.13 percent in 2030, more than 0.4 percent in 2040 and 1.3 percent in 2070. This corresponds to 0.8 mio additional jobs in 2040 and more than 2.6 mio additional jobs in 2070. This implies that the implementation of funded pension plans reduces unemployment. According to simulation results in the EU-27-model, the policy reform reduces the unemployment rate by about 0.1 percentage points in 2030, 0.2 p.p. in 2040 and 0.6 p.p. in 2070.

Figure 140: Change of employment (in percent) and the unemployment rate (in p.p.) in the EU-27-model, 2025-2070

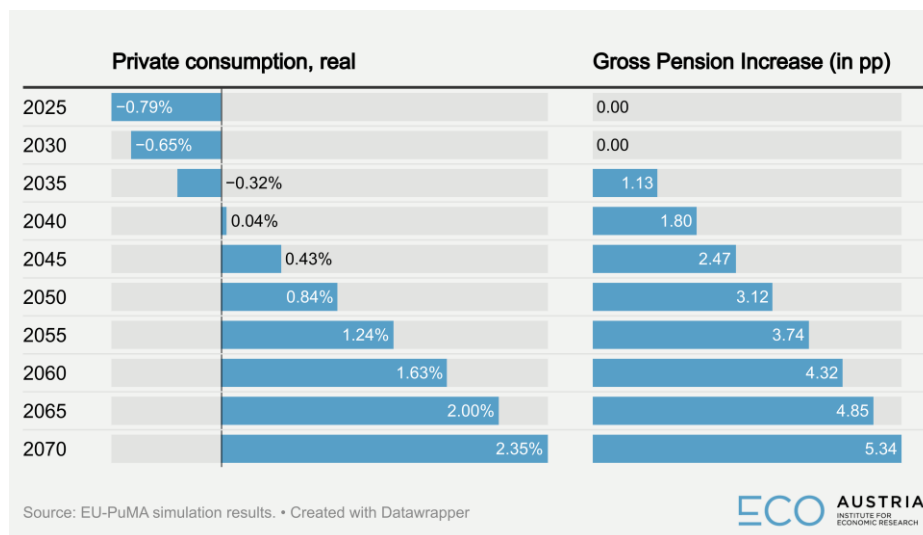


In the short- and medium-term, the additional pension premia reduce disposable income of private households. Therefore, the implementation of pension plans causes a reduction of private consumption in the short- and medium-term. According to Figure 141, the reduction amounts to 0.65 percent in 2030. As time goes by, private households' disposable income is positively

affected by the payment of benefits in the new pension plan. This can be seen in the right part of Figure 141, which indicates the increase of the gross pension benefit of a 66-year-old individual in percent of average gross labour income.⁹⁶ According to the simulation results, the pension benefit of a 66-year-old increases by 1 percent of average gross earnings in 2035, and this number rises to more than 5 percent of average gross earnings in 2070.

In addition to higher pension benefits paid, disposable income increases because labour productivity and employment rise, which boosts households' labour income. Therefore, the short- and medium-term consumption decline is offset by a pronounced long-run increase of real private consumption, which amounts to 0.8 percent in 2050 and 2.35 percent in 2070.

Figure 141: Change of real private consumption (in percent) and pension benefit increase (in p.p.) in the EU-27-model, 2025-2070

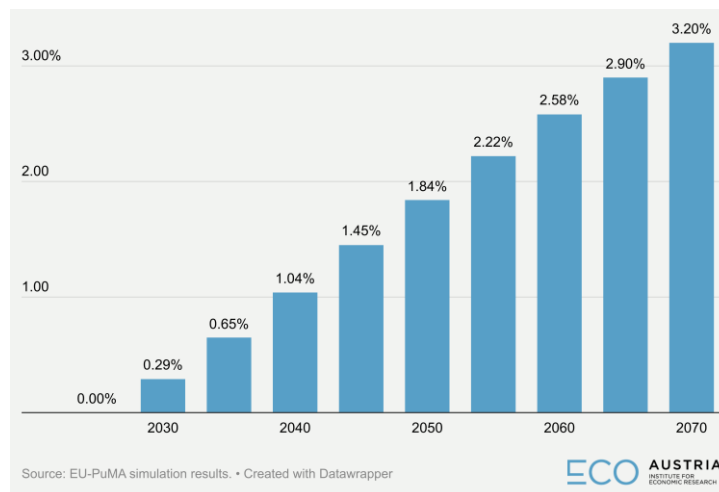


In a production function approach, the higher capital stock and the additional employment result in an increase of value added. In addition to that, the impact of private equity expansion on productivity (see chapter 3.2.1) is captured via an increase of total factor productivity. Accordingly, the implementation of pension plans boosts real GDP by 0.3 percent in 2030, 1 percent in 2040 and about 3.2 percent in 2070 in the EU-27-model.⁹⁷ In 2022 prices, this increase of real EU-27 GDP amounts to about 50 bn. euro in 2030, 170 bn. euro in 2040 and 510 bn. euro in 2070.

⁹⁶ This indicator can be compared with the benefit ratio discussed in the analysis in the previous chapter of the report as the denominator is average gross earnings (instead of the earnings of a 65-year-old individual in the replacement rate indicator).

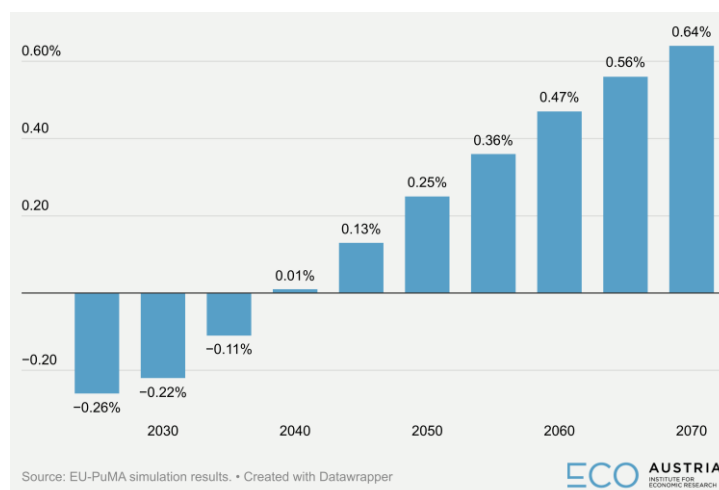
⁹⁷ In the expenditure approach, the moderate increase of real GDP in the short-run is reflected via the discussed increase of investment and decrease of private consumption as well as a moderate improvement of the current account.

Figure 142: Change of real GDP (in percent) in the EU-27-model, 2025-2070



As discussed above, the current simulation scenario merely analyses the implementation of additional contributions to pension plans. We do not analyse whether, for instance, politics uses the additional funded pension benefits to top-up pension benefits (as illustrated in Figure 141, benefit ratios are decreasing in some countries due to already implemented pension reforms) or to use the generated benefits as a substitute for reducing public pension benefits and thus improving sustainability of public finances. Thus, the impact of the policy scenario on public budgets represents ‘indirect effects’ only (on, e.g., consumption and income taxes). Figure 143 illustrates the impact of the policy scenario on the primary balance. In the short-run, the impact on the primary balance is slightly negative (-0.3 percent of GDP in 2025 and -0.2 percent of GDP in 2030). This results from the fact that the negative short-run impact on private consumption reduces revenues from consumption taxes and that this negative impact is more pronounced than the increase of public revenues from taxes and contributions on income. In the medium- and long-run, however, both consumption taxes and taxes and contributions on income increase due to the policy reform. Therefore, the simulation analysis indicates a rather pronounced improvement of the primary balance by 0.5 to more than 0.6 percent of GDP in the long-run.

Figure 143: Change of primary balance (in percent of GDP) in the EU-27-model, 2025-2070



Single country simulation results

In this section, we provide the results of the same reform for the selected European countries in the report. For all considered countries a contribution to a funded pension system of 3 percent of gross wages is supposed. The effect of higher pension fund savings is shown in Table 40 to Table 42. An important difference to the EU-wide simulation is that cross-border effects of additional pension funds are not considered – in the EU-wide simulation the more pronounced effect is a result of the higher share of funded assets invested ‘domestically’ compared to most of the single countries.

Comparing the stock of additional assets in pension funds in the considered countries, the range goes from about 46 percent of GDP in Sweden and Slovakia to 71 percent in the UK in the year 2070⁹⁸. In Austria, the additional stock of pension assets in the simulation would amount to about 56 percent of GDP in 2070. The difference across the countries is mainly the result of two reasons. First, as the basis for the contributions are gross wages, countries with a higher employers’ contributions rate *ceteris paribus* show a lower boost of the asset stock. Higher employer contributions reduce gross wages and therefore reduce contributions into the additional pension scheme in relation to the labour share on GDP. Second, the labour share itself determines the level of contributions. In countries with a higher labour share, remuneration of workers in relation to GDP is higher. *Ceteris paribus*, this implies higher gross wages and as a consequence higher total contributions in relation to GDP.

The additional stock of pension assets boosts real investment in the considered countries. In the year 2070, the extent ranges from 3.3 percent in Sweden to 8.8 percent in UK. In Austria, the investment impact would be 4.5 percent. The difference is largely influenced by the level of asset funds discussed above and the capital stock in the economy. The higher the asset share the larger is the supply of additional financial capital and therefore investment. The lower the capital stock as share of GDP the higher is the impact of additional funding as the additional funds increase the capital stock to a relatively larger extent. The level of investment increases by about 50 bn. Euro (in terms of 2022) in Germany in the long-term, in UK only slightly less. In Italy, more than 25 bn. euro would be additionally invested in 2070. In Austria, real investment rises by about 5 bn. Euro, according to the country size a lower but significant value. The EU-wide implementation implies a more pronounced impact than in most single-country simulations. However, cross-border effects are not taken into account in these single-country results.

The expansion of investment and capital in the economy raises the capital-labour ratio, implying a higher labour productivity of employment. This channels in additional labour demand of firms for workers such that the number of vacancies rises. On the opposite side, higher productivity raises wages and therefore by better labour market perspectives also labour supply inducing more workers to participate on the labour market and unemployed workers to search for a new job more intensively. Furthermore, additional pension fund assets increase capital supply for Private Equity investment. As a consequence, productivity rises by even more. The latter channel is more

⁹⁸ In the following we focus very much on the effect in the year 2070. The reason for the focus is that in the long-term a large part of the funded asset stock has been realized.

pronounced in countries with a low share of pension fund assets on GDP. According to investment, the impact on employment is especially pronounced in the UK, Poland, and Italy. In Germany, employment rises by 1.15 percent. The smallest impact can be found in Sweden with additional employment of about 0.65 percent. In Austria employment rises by 0.8 percent. This implies, that additionally 34.000 persons would be employed in Austria in 2070 following the reform.

Table 40: Simulation results of funded pensions in selected countries (AT, CZ, DE)

Austria	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	2.3%	8.9%	16.3%	23.5%	30.3%	36.6%	42.4%	47.5%	51.9%	55.9%
Real GDP	-0.01%	0.24%	0.51%	0.79%	1.06%	1.32%	1.57%	1.80%	2.00%	2.19%
in mio. euro	-47	1,052	2,274	3,513	4,734	5,908	7,011	8,030	8,956	9,788
Investment, real	0.89%	1.52%	2.07%	2.57%	3.02%	3.41%	3.75%	4.05%	4.30%	4.52%
in mio. euro	987	1,683	2,296	2,850	3,346	3,783	4,164	4,492	4,774	5,012
Private consumption, real	-0.91%	-0.83%	-0.61%	-0.36%	-0.09%	0.19%	0.47%	0.74%	1.01%	1.25%
Employment (no. of workers)	0.01%	0.07%	0.15%	0.25%	0.34%	0.44%	0.53%	0.62%	0.70%	0.76%
in persons	612	3,174	6,702	10,904	15,300	19,616	23,703	27,478	30,900	33,954
Unemployment rate (change in pp)	-0.01	-0.06	-0.10	-0.15	-0.20	-0.25	-0.29	-0.33	-0.36	-0.39
Gross Pension Increase (in pp)	0.00	0.00	1.11	1.78	2.45	3.10	3.73	4.31	4.85	5.34
Primary Balance	-0.29%	-0.25%	-0.15%	-0.05%	0.06%	0.16%	0.26%	0.35%	0.43%	0.50%

Source: EU-PuMA simulation results. • Created with Datawrapper

Czech Republic	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	2.1%	8.2%	14.9%	21.4%	27.6%	33.4%	38.7%	43.4%	47.6%	51.2%
Real GDP	0.00%	0.30%	0.64%	0.99%	1.35%	1.70%	2.03%	2.33%	2.61%	2.86%
in mio. euro	13	822	1,758	2,744	3,735	4,697	5,605	6,445	7,208	7,891
Investment, real	1.27%	2.03%	2.75%	3.42%	4.03%	4.57%	5.04%	5.45%	5.81%	6.11%
in mio. euro	949	1,516	2,055	2,556	3,009	3,412	3,766	4,073	4,337	4,562
Private consumption, real	-1.04%	-0.86%	-0.52%	-0.15%	0.24%	0.64%	1.04%	1.41%	1.76%	2.09%
Employment (no. of workers)	0.02%	0.10%	0.20%	0.32%	0.45%	0.57%	0.69%	0.80%	0.90%	0.98%
in persons	1,150	5,298	10,570	16,766	23,268	29,665	35,724	41,317	46,378	50,888
Unemployment rate (change in pp)	-0.01	-0.06	-0.12	-0.18	-0.23	-0.29	-0.34	-0.39	-0.43	-0.47
Gross Pension Increase (in pp)	0.00	0.00	1.14	1.84	2.57	3.29	3.99	4.64	5.26	5.81
Primary Balance	-0.15%	-0.09%	0.00%	0.09%	0.18%	0.27%	0.35%	0.42%	0.49%	0.54%

Source: EU-PuMA simulation results. • Created with Datawrapper

Germany	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	2.6%	10.1%	18.4%	26.5%	34.2%	41.4%	47.8%	53.6%	58.8%	63.3%
Real GDP	0.05%	0.37%	0.72%	1.08%	1.44%	1.78%	2.10%	2.40%	2.66%	2.91%
in mio. euro	1,999	14,450	28,102	42,004	55,761	68,988	81,421	92,892	103,316	112,667
Investment, real	1.32%	2.17%	2.90%	3.57%	4.16%	4.68%	5.12%	5.51%	5.84%	6.12%
in mio. euro	10,750	17,616	23,567	28,956	33,753	37,957	41,599	44,728	47,395	49,654
Private consumption, real	-0.84%	-0.69%	-0.36%	0.00%	0.37%	0.74%	1.11%	1.47%	1.81%	2.13%
Employment (no. of workers)	0.06%	0.16%	0.27%	0.41%	0.55%	0.69%	0.82%	0.94%	1.05%	1.15%
in persons	24,880	66,565	116,826	174,875	235,320	294,302	349,837	400,932	447,142	488,358
Unemployment rate (change in pp)	-0.03	-0.09	-0.17	-0.24	-0.31	-0.37	-0.43	-0.49	-0.54	-0.58
Gross Pension Increase (in pp)	0.00	0.00	1.18	1.88	2.58	3.27	3.93	4.56	5.13	5.65
Primary Balance	-0.29%	-0.26%	-0.17%	-0.07%	0.02%	0.12%	0.21%	0.30%	0.37%	0.44%

Source: EU-PuMA simulation results. • Created with Datawrapper

Employment would rise by about 490,000 persons in Germany and UK, in Italy by 280,000, and Poland by 220,000. Accordingly, the unemployment rate decreases between 0.3 and 0.7

percentage points. The comparably low impact on the unemployment rate in Italy given the strong employment effect is due to high labour supply elasticities in Italy. The reform induces more people to join the labour market than in other countries leading to a smaller impact on the unemployment rate. The employment effect of additional assets in pension funds is therefore considerably. As for investment, compared to the results of the EU-wide simulation, the single-country employment effect is generally lower than the EU-wide impact of such a reform.

Table 41: Simulation results of funded pensions in selected countries (IT, LV, PL)

Italy	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	2.1%	8.5%	15.9%	23.5%	30.9%	38.0%	44.7%	51.0%	56.6%	61.8%
Real GDP	0.00%	0.28%	0.62%	0.98%	1.35%	1.72%	2.09%	2.44%	2.77%	3.08%
in mio. euro	26	5,458	12,078	19,101	26,318	33,541	40,616	47,422	53,873	59,907
Investment, real	1.23%	2.21%	3.08%	3.89%	4.63%	5.31%	5.92%	6.47%	6.95%	7.38%
in mio. euro	4,290	7,703	10,738	13,556	16,147	18,505	20,629	22,528	24,212	25,696
Private consumption, real	-0.69%	-0.61%	-0.38%	-0.12%	0.16%	0.46%	0.77%	1.07%	1.37%	1.65%
Employment (no. of workers)	0.00%	0.10%	0.22%	0.37%	0.52%	0.67%	0.82%	0.96%	1.09%	1.22%
in persons	410	22,503	51,761	84,778	119,457	154,395	188,622	221,450	252,405	281,184
Unemployment rate (change in pp)	0.00	-0.04	-0.08	-0.13	-0.17	-0.22	-0.26	-0.30	-0.34	-0.38
Gross Pension Increase (in pp)	0.00	0.00	1.18	1.89	2.63	3.37	4.10	4.80	5.47	6.10
Primary Balance	-0.28%	-0.28%	-0.19%	-0.11%	-0.02%	0.07%	0.16%	0.24%	0.32%	0.39%

Source: EU-PuMA simulation results. • Created with Datawrapper

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Latvia	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	2.4%	9.3%	16.7%	23.9%	30.7%	37.0%	42.6%	47.7%	52.2%	56.0%
Real GDP	0.00%	0.28%	0.60%	0.93%	1.27%	1.59%	1.90%	2.18%	2.44%	2.67%
in mio. euro	2	109	233	363	493	619	738	848	948	1,038
Investment, real	1.63%	2.44%	3.17%	3.82%	4.38%	4.86%	5.27%	5.61%	5.90%	6.13%
in mio. euro	144	215	279	337	387	429	465	495	520	541
Private consumption, real	-0.71%	-0.54%	-0.25%	0.06%	0.38%	0.71%	1.03%	1.33%	1.62%	1.89%
Employment (no. of workers)	0.03%	0.13%	0.24%	0.37%	0.50%	0.64%	0.76%	0.87%	0.97%	1.07%
in persons	247	1,116	2,149	3,301	4,494	5,661	6,760	7,770	8,682	9,494
Unemployment rate (change in pp)	-0.01	-0.07	-0.14	-0.21	-0.27	-0.34	-0.39	-0.45	-0.50	-0.54
Gross Pension Increase (in pp)	0.00	0.00	1.18	1.91	2.65	3.38	4.08	4.74	5.35	5.91
Primary Balance	-0.22%	-0.16%	-0.06%	0.04%	0.14%	0.23%	0.31%	0.39%	0.45%	0.51%

Source: EU-PuMA simulation results. • Created with Datawrapper

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Poland	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	2.3%	8.7%	15.7%	22.6%	29.1%	35.1%	40.6%	45.5%	49.8%	53.6%
Real GDP	0.01%	0.37%	0.79%	1.23%	1.67%	2.10%	2.51%	2.89%	3.23%	3.54%
in mio. euro	97	2,463	5,203	8,084	10,987	13,811	16,487	18,969	21,234	23,272
Investment, real	1.67%	2.72%	3.66%	4.51%	5.25%	5.90%	6.46%	6.94%	7.35%	7.69%
in mio. euro	2,208	3,597	4,845	5,963	6,950	7,809	8,550	9,183	9,721	10,175
Private consumption, real	-0.86%	-0.65%	-0.30%	0.07%	0.46%	0.85%	1.23%	1.59%	1.92%	2.23%
Employment (no. of workers)	0.03%	0.14%	0.29%	0.44%	0.61%	0.77%	0.93%	1.07%	1.20%	1.32%
in persons	4,595	24,183	47,762	74,271	102,003	129,384	155,396	179,467	201,322	220,874
Unemployment rate (change in pp)	-0.02	-0.08	-0.16	-0.25	-0.33	-0.41	-0.48	-0.55	-0.61	-0.67
Gross Pension Increase (in pp)	0.00	0.00	1.09	1.76	2.44	3.11	3.75	4.35	4.91	5.41
Primary Balance	-0.28%	-0.21%	-0.08%	0.05%	0.18%	0.30%	0.42%	0.52%	0.61%	0.69%

Source: EU-PuMA simulation results. • Created with Datawrapper

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The rise in gross pensions related to average gross labour income is very similar across the countries, although the share of assets in pension funds varies considerably across the countries. The reason for the alignment is again employers' contributions. Ceteris paribus, on the one hand

this reduces the additional amount of contributions and assets in percent of GDP. On the other hand, they dampen average gross labour income to which the rise in gross pensions is related to.

Table 42: Simulation results of funded pensions in selected countries (SK, SE, UK)

Slovakia	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	2.0%	7.6%	13.7%	19.7%	25.4%	30.7%	35.5%	39.7%	43.5%	46.8%
Real GDP	-0.01%	0.21%	0.47%	0.75%	1.03%	1.30%	1.56%	1.80%	2.01%	2.20%
in mio. euro	-15	227	515	821	1,129	1,428	1,710	1,970	2,205	2,416
Investment, real	1.17%	1.84%	2.44%	2.97%	3.44%	3.83%	4.16%	4.43%	4.66%	4.85%
in mio. euro	301	471	625	762	880	980	1,064	1,135	1,193	1,241
Private consumption, real	-0.84%	-0.76%	-0.57%	-0.36%	-0.14%	0.08%	0.30%	0.52%	0.72%	0.90%
Employment (no. of workers)	0.01%	0.07%	0.15%	0.25%	0.35%	0.45%	0.55%	0.64%	0.72%	0.79%
in persons	271	1,800	3,944	6,497	9,171	11,799	14,285	16,576	18,644	20,483
Unemployment rate (change in pp)	-0.01	-0.04	-0.08	-0.13	-0.17	-0.21	-0.24	-0.28	-0.31	-0.34
Gross Pension Increase (in pp)	0.00	0.00	1.10	1.79	2.50	3.21	3.89	4.54	5.15	5.69
Primary Balance	-0.18%	-0.14%	-0.06%	0.01%	0.08%	0.15%	0.22%	0.27%	0.32%	0.37%

Source: EU-PuMA simulation results. • Created with Datawrapper

Sweden	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	1.9%	7.4%	13.7%	19.8%	25.5%	30.7%	35.4%	39.6%	43.3%	46.4%
Real GDP	-0.05%	0.07%	0.23%	0.41%	0.59%	0.78%	0.95%	1.11%	1.26%	1.39%
in mio. euro	-275	368	1,286	2,297	3,337	4,363	5,342	6,255	7,090	7,842
Investment, real	0.66%	1.10%	1.50%	1.87%	2.21%	2.50%	2.76%	2.99%	3.18%	3.34%
in mio. euro	934	1,557	2,124	2,652	3,128	3,549	3,916	4,233	4,504	4,734
Private consumption, real	-0.81%	-0.85%	-0.71%	-0.55%	-0.37%	-0.18%	0.01%	0.20%	0.38%	0.56%
Employment (no. of workers)	0.00%	0.04%	0.11%	0.19%	0.28%	0.36%	0.44%	0.52%	0.59%	0.65%
in persons	130	1,972	5,540	9,907	14,506	19,036	23,326	27,283	30,862	34,048
Unemployment rate (change in pp)	-0.01	-0.04	-0.09	-0.14	-0.18	-0.23	-0.27	-0.31	-0.35	-0.38
Gross Pension Increase (in pp)	0.00	0.00	1.22	1.92	2.61	3.27	3.90	4.49	5.02	5.50
Primary Balance	-0.28%	-0.28%	-0.20%	-0.11%	-0.01%	0.10%	0.19%	0.29%	0.37%	0.45%

Source: EU-PuMA simulation results. • Created with Datawrapper

UK	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Assets in pension funds (in % of GDP)	2.8%	11.1%	20.2%	29.1%	37.7%	45.7%	53.1%	59.6%	65.5%	70.7%
Real GDP	0.00%	0.29%	0.66%	1.07%	1.50%	1.92%	2.33%	2.71%	3.06%	3.38%
in mio. euro	-74	8,530	19,491	31,553	44,051	56,457	68,397	79,626	89,996	99,432
Investment, real	1.88%	2.99%	4.01%	4.96%	5.83%	6.61%	7.29%	7.88%	8.40%	8.84%
in mio. euro	9,938	15,787	21,171	26,213	30,806	34,909	38,521	41,669	44,389	46,723
Private consumption, real	-0.87%	-0.68%	-0.31%	0.12%	0.57%	1.03%	1.49%	1.94%	2.36%	2.75%
Employment (no. of workers)	0.02%	0.14%	0.30%	0.48%	0.67%	0.85%	1.03%	1.20%	1.36%	1.50%
in persons	6,988	46,724	97,522	156,014	217,815	279,348	338,385	393,615	444,320	490,184
Unemployment rate (change in pp)	-0.01	-0.08	-0.15	-0.23	-0.31	-0.39	-0.47	-0.54	-0.60	-0.66
Gross Pension Increase (in pp)	0.00	0.00	1.10	1.77	2.46	3.13	3.78	4.40	4.96	5.48
Primary Balance	-0.31%	-0.29%	-0.21%	-0.12%	-0.03%	0.05%	0.14%	0.21%	0.28%	0.35%

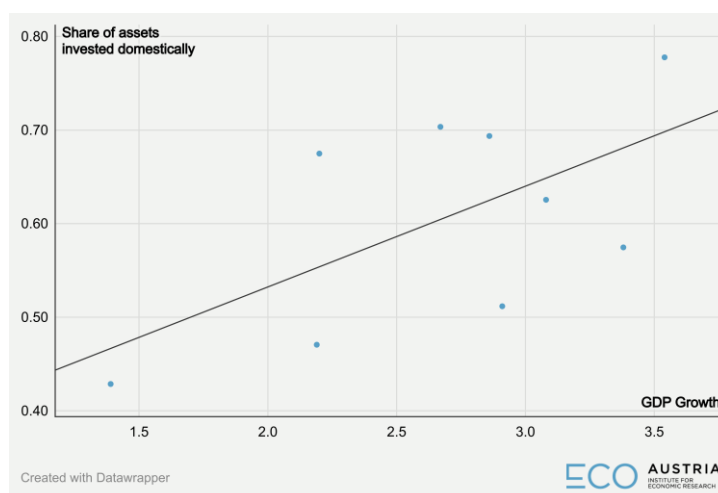
Source: EU-PuMA simulation results. • Created with Datawrapper

The impact on private consumption again differs between the selected countries between 0.6 percent in Sweden und 2,7 percent in UK in 2070. There are several channels which lead to the result. First, the additional amount of assets in pension funds has an important impact on additional consumption. The additional assets in pension funds in Sweden are about two thirds of those in UK. Second, the higher the impact on GDP, the higher is the rise of income of private households and private consumption due to economic expansion. Third, a higher tax and social

contribution ratio leads to a weaker boost of private income and therefore private consumption. For example, although Swedish GDP rises less pronouncedly than in the UK, the positive impact on the primary balance is higher in Sweden. The rise in private consumption is also high in Poland and Germany. For Austria, real private consumption would rise by 1.3 percent.

The policy reform increases economic activity in all the single countries considered. The extent is very much determined by the impact on investment and employment. GDP boosts because of higher savings by between 1.4 percent in Sweden to 3.5 percent in Poland. For Austria GDP would be 2.2 percent higher, in Germany 2.9 percent and in Italy by 3.1 percent. As shown in Figure 144, the extent of the home bias has a significant impact on the GDP effect. The importance of capital in the production function, the tax system and the labour market (labour supply and demand elasticities) also play an important role for the overall impact of the reform. Across the countries and related to the value of GDP in the year 2022 GDP would increase by more than 110 bn. euro in Germany (in 2070), in Italy by 60 bn. euro and Poland by 23 bn. euro. For Austria, the economy would expand by nearly 10 bn. euro.

Figure 144: Relation impact on GDP and Share of Assets Invested Domestically



As a result of the economic expansion public budgetary balance improves significantly in the countries. The primary balance (government deficit before interest payments for debt) improves by about 0.4 percent to 0.5 percent of GDP in most countries. In Latvia und Poland the improvement is even higher with 0.5 and 0.7 percent of GDP. In Austria the impact is higher than in Germany, despite the lower impact on growth, which can be attributed to the higher level of taxation in Austria.

Summing up the results of the simulation, the expansion of pension funds in Europe would boost the economy in all the considered countries. The results are very much in line with the empirical results about the impact of pension funds on growth. Very much alike the impact of demographic changes, the time horizon until the reform is fully effective is very long. However, the primary goal of funded pension contributions is to increase income during retirement. As the replacement rate in the public pension system will be cut in the future in many countries, higher saving rates via pension funds are one way to absorb this development.

3.2.4. Key lessons from the scenario analysis

- A contribution of 3 percent of gross wages to pension funds is assumed in the simulation.
- The contributions to the pension fund will increase gross pension benefit by 5.5 to 6 percent of average gross labour income at the end of the forecast horizon.
- The simulation with EU-PuMA shows that the additional capital supply (ranging from 3.3 to 8.8 percent) boosts GDP by 1.4 to 3.5 percent at the end of the forecast horizon.
- The impact on GDP rises with the home bias of investment.
- The reform increases employment and leads to a decline of unemployment. Across the overall EU 2.6 Mio. additional jobs could be created at the end of the forecast horizon.
- Public revenues decline in the short- and medium-term due to the tax exemption of pension funds contributions and lower private consumption but increase in the long-term due to taxation of benefits and higher private consumption.

4. Conclusions

The subject of the study is a presentation and evaluation of the pension systems in Europe. The first result from the analysis is the diversity of the systems with regard to the design and integration of their tiers and components. While the functions and aims of pension systems are rather similar across Europe – e.g. preventing old-age poverty, smoothing consumption over the life cycle and maintaining living standards in old age – the form and extent to which these functions are fulfilled vary considerably across Europe. For these differences, it is necessary to understand pension systems in their historical genesis and in the context of employment systems and the institutionalisation of welfare systems. The respective historical and institutional context provides the framework for the design of pension systems in Europe.

Despite all the differences, types and clusters can still be identified – for example, “market-oriented” funded mandatory systems or “corporatist” social security systems based on PAYG financing. However, even within these clusters and types, the systems differ in the way they promote and integrate different tiers and elements. Differences concern the design and integration of the components and the extent to which certain functions are ensured by PAYG or funded elements. These differences arise in particular in the design of such elements and components, that provide for an equalisation of living standards and income over the lifespan. This function is generally located in the 2nd tier of earnings-related pension income. Differences concern the degree to which the objective of securing the standard of living is to be guaranteed by the public statutory pension scheme. In parts of the countries considered, for instance the Netherlands, the UK or Sweden, this objective is to a large extent shifted to funded occupational schemes. In other countries, such as Germany, Austria and Italy, the function of maintaining the standard of living is ensured by equivalence-oriented elements of pension entitlements under the state PAYG-based pension system. The “benefit principle” of individual equivalency between contributions and benefits is implemented in the institutional form of calculating benefit entitlements from contribution payments, periods of contribution payments and supplementary episodes respectively. These institutional forms are anchored in public statutory NDC or pension-point systems, which form the basis for the calculation of pension benefits. In countries where earnings-related pension provision is more intensely based on PAYG systems, pension entitlements from occupational or individually financed pension plans tend to have a supplementary character.

For all the given differences in the pension systems of European countries, we identify similarities and commonalities: Voluntary individual pension provision in the 3rd tier is consistently based on funded pension plans. In most of the countries considered the individual participation in funded pension plans is supported by the state, either in the form of indirect tax incentives or by direct subsidies. The guarantee of a minimum income in old age within the 1st tier is mostly based on elements of state or public financing via general taxes and payments from general state budgets. In part, the basic old-age income security is integrated into the general public pension system, in part it is guaranteed outside the system by general social assistance benefits. None of the pension schemes considered is based exclusively on funded or exclusively on PAYG elements across all relevant tiers.

The results of the country studies show that the greatest differences are in the form of earnings-related security of living standards. The countries considered show great diversity regarding the provision of earnings-related retirement income. 2nd tier pensions can be classified into four types: defined benefit (DB), point system, notional defined contribution (NDC), and mandatory (private or public) funded defined contribution (FDC). However, our analyses show, that the results regarding sustainability, market capitalization and promotion of innovation, affordability or equitability are not neutral or independent from the form of institutionalisation. The political debate is sometimes reduced by opponents of pension reforms to a promotion of funded elements at the expense of a reduction or even abolition of PAYG elements. A systematic analysis, which was carried out within the framework of the "Overall Pension Index" (OPI) on the basis of a multidimensional set of "quality criteria", shows that the increased integration of funded components into the pension system can, on the contrary, even promote stability and sustainability of the pension systems. Due to the diversified risk structure of integrated systems, which include both PAYG-based and funded components, funded pension elements also strengthen the risk robustness of pension systems. The best results from the OPI-index are calculated for Sweden, Denmark, and the Netherlands and for their overall pension systems, which can be labelled as "mandatory funded" and "funded" schemes. The UK with its more pronounced liberal and market-oriented system (apart from a statutory basic provision) achieves a medium score, on par with countries with more PAYG-financed systems such as Austria, Germany or Poland. For the remaining types, no clear pattern is obvious at this stage. With "corporatist" Italy and "modest" and "transitional" Latvia two countries of different clusters show the weakest results.

It turns out that pension systems with a stronger focus on funded pensions, such as in Sweden, Denmark or the Netherlands, show the expected positive results in terms of sustainability and market capitalisation. Sweden ranks 2nd with regard to sustainability and Denmark ranks 3rd. At the same time, these systems also have other areas of strength. Among the 11 countries considered, the Netherlands is 3rd in terms of affordability and adequacy. Sweden achieves the 2nd best result among the 11 countries considered in terms of robustness against exogenous risks and Denmark ranks 2nd in terms of adequacy and 1st in terms of robustness.

Denmark has a highly developed funded pension tier. Retirement income security is largely based on funded pensions, but Denmark also has the second lowest risk of poverty and social exclusion for older people. The relative risk of poverty and social exclusion for older people compared to those under 65 years shows only small differences between Sweden and Denmark and Italy, Germany or Austria. Furthermore, pension systems that more intensely rely on funded pensions, especially Denmark and Sweden, achieve favourable results as regards risk robustness against exogenous macroeconomic shocks. Among the eleven countries examined, the Dutch pension system showed the highest level of robustness in terms of the development of benefit expenditure by private pension providers over the years of the financial crisis in the years 2005 to 2009.

The quality of the Dutch pension system, for example, is also reflected in the third lowest S80/S20 indicator for people aged 65 and over among the 11 countries examined. This result underlines the "redistributive capacity" of the Dutch pension system, which is mainly based on funded forms

of pension provision, especially in the 2nd tier. A common “prejudice” according to which funded systems would tend to reproduce and maintain inequalities in income distribution more than PAYG systems is refuted by this result. Specifically, the Dutch system integrates strongly funded pension components with a more redistributive basic pension provision. By this integration the overall system performs well in terms of adequacy, affordability and equitability. In contrast, Italy, with its PAYG systems has the highest level of income inequality for persons aged 65 and above according to the S80/S20 indicator. As shown, for the more pronounced PAYG-systems there is not only catch-up potential for more sustainability. Italy ranks 11th in terms of sustainability, but also shows weak results in terms of affordability or equitability. Austria ranks 9th with regard to sustainability, 10th with regard to affordability and only 6th in terms of market capitalization. According to the S80/S20 indicator, Austria has the third highest income inequality for older people, following Italy and the UK.

A comprehensive assessment of the quality of pension systems was carried out in the criteria scheme of the Overall Pension Index (OPI). The relevant criteria for the OPI assessment are adequacy, sustainability, affordability, equitability, robustness and the promotion of innovation and development by market capitalisation. Here, it first becomes evident that systems that more intensely rely on funded elements have advantages with regard to sustainability. Systems with more pronounced PAYG elements tend to guarantee greater generosity or adequacy in terms of benefit ratios within their public pension systems, but at the same time these systems are also more affected by the mid-term and long-term financing problems of ageing societies and rising old-age dependencies. These countries either aim to ensure total pension sustainability through the implementation of policy reforms or postpone the financing problem into the future when there are no or only insufficient reforms to ensure sustainability. The majority of PAYG-based systems provide for certain elements of ensuring the sustainability and moderation of expenditure, mostly at the price of decreasing generosity of public pension systems. Pension policies aim to promote and encourage the participation in funded pension schemes to compensate for the loss of adequacy of their public statutory systems. At this point in time, so to speak, on the “late eve” of the upcoming demographic transition, funded pension systems are “better prepared”, since the provision of benefits is based less on the future financing conditions of pension entitlements and more on the capital stock that has already been built up and accumulated at the time of retirement. The overall assessment shows that the strengths of the more strongly funded systems are by no means only in the area of sustainability. Conversely, the greater importance of funded pensions in Sweden, Denmark or the Netherlands is not synonymous with less robustness, equitability or adequacy.

Another important quality aspect of funded pension systems is the provision of investment capital to promote innovation, business dynamism and growth. The evaluation as part of the Overall Pension Index (OPI) shows that countries with higher pension assets tend to achieve better results in terms of innovation performance according to the European Innovation Scoreboard or the Global Innovation Scoreboard. They also perform better as regards the provision of risk and venture capital and achieve a high start-up density.

The supply of financial assets boosts national investment and as consequence labour demand, labour income and GDP. In addition, higher pension fund assets expand supply of financial funds for private equity investments leading to a higher productivity in the economy. GDP and real investment in the considered economies rise in line with the stock of pension funds and are significantly higher than without pension fund investments. For the EU-27 GDP per capita rises by 1.130 Euro in 2070. Moreover, the higher economic activity improves public finances in these countries by about 0.4 to 0.5 percent of GDP, if implemented on the EU-level by 0.6.

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