RZECZPOSPOLITA POLSKA

Economic Policy Committee - Ageing Working Group

2024 Ageing Report

Poland - Country Fiche

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Table of contents

List of tables

List of figures

Introduction

The present country fiche for Poland is part of the 2024 Ageing Report, which provides long-term projections of the economic and budgetary impact of population ageing at unchanged policy. The 2024 edition is the eighth update and covers the period up to 2070.

This fiche was prepared by The Ministry of Finance of Poland and National Bank of Poland. The pension projections presented in this fiche incorporate the macroeconomic assumptions and methodologies agreed within the *Ageing Working Group* of the *Economic Policy Committee*. The projections have been peer reviewed by the other Member States and the European Commission within the *Ageing Working Group*. The projections were finalised in the autumn of 2023 and represent the situation of the pension system on 30/06/2023.

Section 1 provides a general overview of the pension system in Poland. Section 2 describes the demographic and labour market assumptions underlying the pension expenditure projections presented in Section 3, which also discusses the sensitivity scenarios around the baseline. Finally, Section 4 gives an overview of the model used to produce the pension projections, with complementary data provided in the methodological annex.

1. Overview of the pension system[1]

1.1. Description of the pension system

The Polish pension system consists of three major social insurance systems. The projection of the Polish pension system includes all the following:

- the general pension system for the majority of employees and self-employed,
- the farmers' pension system,
- pension schemes for security provision systems (for Police officers and officers other security services, professional soldiers, judges and prosecutors), which function separately without contributions and are financed from the State Budget.

Each of these systems operates under separate rules and concerns different group of persons. In 2022, the general pension system (administrated by the Social Insurance Institution - ZUS) covered 87% of the pension expenditures and 86% of the pensioners (Figure A[2]). In 2022, the farmers' scheme (Agricultural Social Insurance Fund - KRUS) covered 10% of pensioners but only 7% of the total pension expenditures. Due to a gradual restructuring of farm production, there is a constant shift from KRUS to ZUS regarding the number of pensioners and expenditures. A steady decline in the number of pensioners in KRUS and an increase in ZUS and a continuation of this trend is assumed in the future. This trend is due to economic changes, as the share of people employed in agriculture decreases with the development of the economy, but also due to changes in the labour market, as discussed further in the document. Other pensioners receive their benefits from various security provision systems. The characteristic feature of these systems is a lack of contributions and the same benefit indexation rules as in the general system (with a minor exception, see below). However, these systems have different regulations regarding eligibility and formulas for the calculation of the benefits, as described in the following chapters.

ADDITIONAL FIGURE A – THE STRUCTURE OF THE POLISH PENSION SYSTEM
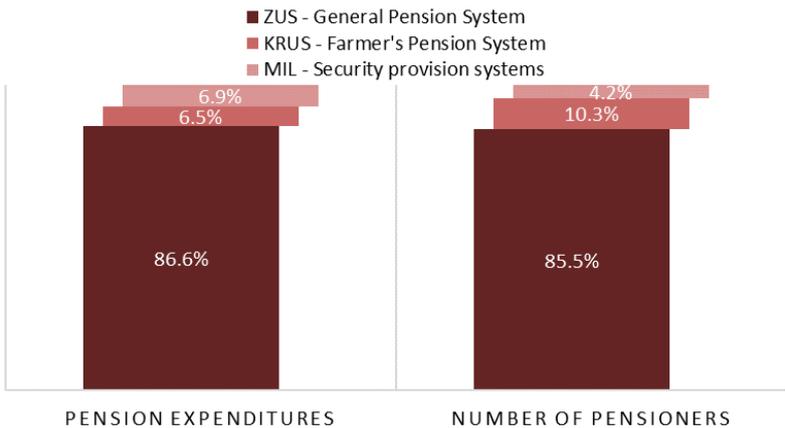
Source: Polish Ministry of Finance

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[1] For an exhaustive description of pension schemes, please consult the PENSREF database.

[2] To keep the same table numbers as in the documents provided by other member states, the tables supplementary to the obligatory description tables of the pension systems are labelled with letters.

This country fiche aims to present the new long-term pension projections and discuss factors that influence the total public pension expenditure. However, since the three subsystems have different rules, they have been modelled separately. Detailed results for each system are only a supplement to the total. Results of particular subsystems are presented in selected tables in this document.

1.1.1 Detailed description of the general pension system

Social insurance in Poland includes insurance against old age, inability to work, loss of the person who supported the family, accidents at work and, occupational diseases, illness, and maternity. In 2022, the general social insurance system covered about 16.3 million contributors (90% of all employees according to LFS data assumed in the projection and 97.1% of non-farm employees). The system paid benefits to 8.3 million beneficiaries in 2022.

The structure of the general pension system

There are three pillars of the general pension system. Two are mandatory and the third one is voluntary.

The mandatory part of the system is divided into two pillars: non-financial (NDC - national defined contributions) and financial (FDC - funded defined contributions). The former is managed by a public institution – Social Insurance Institution (ZUS) – the latter by private institutions.

Following the reform of 2014, the participation in the individual, capital pillar of the system (OFE) is no longer obligatory but if a person decides not to participate in the funded pillar, the whole contribution goes to the first, NDC pillar. It means that participation or not in the FDC pillar does not affect the level of a contribution rate and should not significantly determine the level of future benefits (additional table A).

Currently, the general pension system covers different groups of insured as follows:

- People who have one account in NDC system.
- People who have an account and subaccount in NDC system.
- People who have an account and subaccount in NDC system and FDC in the mandatory funded pillar.

The account and subaccount differ in the method of indexation and inheritance rules.

The statutory retirement age in the Polish system is 60 years for women and 65 years for men (Table 1). It is possible to retire up to five years earlier in the case of work in specific conditions (limited list of occupations) which is called bridging pensions, but only if additional conditions are fulfilled (minimum contributory period is 20 years for women and 25 years for men). In 2022, the bridging pension was paid to about 39 thousand persons. It should be noted that bridging pensions are paid from a different fund than old-age pensions, it is an additional insurance system for people below retirement age. There is no possibility to receive old-age benefit below 60/65 years old.

In principle there is no requirement regarding **minimum contributory period** in the general system. However, guaranteed access to the minimum pension requires a minimum number of years of paying contributions. That is why the minimum contributory period has been mentioned in the Table 1 but it

is possible to retire without any contributory period conditions after reaching statutory retirement age.

TABLE 1 – QUALIFYING CONDITIONS FOR RETIREMENT IN THE GENERAL SYSTEM*

			2022	2030	2040	2050	2060	2070
Qualifying condition for retiring with a full pension		Statutory retirement age - men	65	65	65	65	65	65
		Statutory retirement age - women	60	60	60	60	60	60
	Minimum requirements	Contributory period – men**	(25)	(25)	(25)	(25)	(25)	(25)
		Retirement age – men	65	65	65	65	65	65
		Contributory period – women**	(20)	(20)	(20)	(20)	(20)	(20)
		Retirement age – women	60	60	60	60	60	60
Qualifying condition for retirement *without* a full pension		Early retirement age – men***	60	60	60	60	60	60
		Early retirement age – women***	55	55	55	55	55	55
		Penalty in case of earliest retirement age	-	-	-	-	-	-
		Bonus in case of late retirement****	PIT 0	PIT 0	PIT 0	PIT 0	PIT 0	PIT 0
		Minimum contributory period – men**	25	25	25	25	25	25
		Minimum contributory period – women**	20	20	20	20	20	20
		Minimum residence period – men	-	-	-	-	-	-
		Minimum residence period – women	-	-	-	-	-	-

Source: Polish Ministry of Finance, *information on the general system, detailed requirements for special systems described in specific chapters, **in principle for persons born after 31.12.1948 the minimum contributory period is not specified, in the table we report the minimum contributory period for persons who were born before 31.12.1948 and for minimum pension eligibility for persons born after 31.12.1948, ***the possibility of the 5 years lower retirement age is limited only to persons who can prove 15 years of work in special conditions and teachers. This is called "bridging pensions" and in strictly limited. ****PIT 0 is a recently introduced income tax exemption for persons who reach retirement age and continue to work instead of retiring (see more information in chapter 1.2)

Contributions paid in the general system

The contribution rate[3] in the general system is equal for all insured no matter in which pillar they are. However, there are three patterns of splitting old-age pension contributions (Additional table A):

ADDITIONAL TABLE A – THE SPLIT OF THE OLD-AGE PENSION CONTRIBUTIONS IN THE GENERAL PENSION SYSTEM

	National scheme (NDC 1st account)	Sub-account (NDC 2nd account)	Pension fund (FDC)	Total pension contribution
Insured with funded pillar	12.22%	4.38%	2.92%	19.52%
Insured without funded pillar	12.22%	7.30%	-	19.52%
Insured without funded pillar who never chose funded tier	19.52%	-	-	19.52%

Source: Polish Ministry of Finance

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[3] The contributions are calculated in relation to so called "contribution basis" which is with small exceptions equal to gross wage in case of the employees.

Social contributions in Poland are paid to four different funds (Additional table B): old-age contribution (19.52%), disability and survival (8%), sickness (2.45%), work accident (from 0.67% to 3.33%). Regarding the old-age pensions the payment of the contribution is split into two halves between employee and employer.

ADDITIONAL TABLE B – THE CONTRIBUTION RATES TO VARIOUS SOCIAL SECURITY FUNDS BY CONTRIBUTION PAYERS

	Employee	Employer
Old-age	9.76%	9.76%
Disability	1.5%	6.5%
Sickness	2.45%	-
Work accident	-	0.67-3.33%

Source: Polish Ministry of Finance

In the case of a member of an open pension fund, part of the contribution – 2.92% of the wage – is transferred by ZUS to the fund of the member's choice. The remaining part is left in ZUS. Due to the reform of May 2011 the new, additional NDC subaccount in ZUS has been established (it is subject to inheritance), however the total amount of old-age pension contribution is still equal to 19.52 per cent. The ceiling to contributions and pensionable earnings is set at 2.5 times the average monthly earnings. The general pension system also covers the self-employed. These persons pay in principle the same contribution rates but some detailed regulations and the base are different from those governing the employees. The base is equal for all self-employed and amounts to 60% of the average wage. However, there are some exceptions which aim to support small entrepreneurs at the initial stage of business development.

Valorisation

NDC accounts are maintained by ZUS. The first one is indexed to the growth of the covered wage bill and equals no less than price inflation. The sub-account is indexed annually by the average annual GDP growth rate in current prices from the last 5 years.

Payments from funded pillar

Pension payments under the funded pillar to persons having reached the retirement age are made integrally by ZUS (with the same pension formula as in the first pillar). For this purpose, a so-called "safety slider" was introduced: the funds accumulated in the open pension fund are gradually transferred to ZUS, over 10 years preceding the retirement age of the insured person. This should enhance stability and security of accumulated funds and reduce costs associated with their collection.

The old-age pension benefits

The old-age pension benefits in the general pension system after the 1999 reform are calculated according to the following **formula**:

$$Old-age\ pension = \frac{valorised\ funds\ from\ pension\ accounts + initial\ capital}{life\ expectancy\ (unisex\ tables)\ at\ the\ age\ of\ retirement}$$

(Eq. 1)

Indexation

Pensions are indexed annually to the Consumer Price Index in the preceding calendar year and are increased by 20% of real growth of average monthly earnings in the preceding calendar year.

Minimum pension

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 - 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. In the projections, the minimum pension is calculated according to the agreed methodology – in line with the current law for the first 10 years and then indexed to wage growth.

There is **no minimum contributory period** in the general pension system. It means that even extremely low benefits are paid out. On the other hand, all people who receive pensions are covered by health insurance. As a result, even very low pensions give right to this insurance. The possibility of introducing a minimum contributory period is being discussed. Such period existed in the old DB system. From an analytical point of view, it results in lower average pensions under the new system, i.e. due to the inclusion of low-level benefits.

Third pillar – current situation

To increase future level of benefits, the mandatory system is supplemented with voluntary savings in the framework of Employee Capital Plans (PPK). This pillar is voluntary but there is auto-enrolment implemented. Additionally, financial incentives have been introduced to increase participation in this pillar. Payments for PPK accounts come from three sources: employer, employee and state. Employer: basic payment - 1.5% gross wage; voluntary additional payment – maximum 2.5% gross wage. Employee: basic payment - 2% gross wage; voluntary additional payment – maximum 2% gross wage. There are also additional incentive payments from the State: the singular welcome payment of PLN 250 and annual payment of PLN 240.

There are also other kinds of programmes under the third pillar: Occupational Pension Schemes (PPE), Individual Pension Account (IKE) and Individual Pension Security Account (IKZE). The current coverage of these systems is presented below (Additional table C).

ADDITIONAL TABLE C - BASIC DATA ON PENSION PRODUCTS (AS OF DECEMBER 31, 2022)

Product	Number of fund management institutions	Value of accumulated assets (in billion PLN)	Number of participants (in thousands)
PPE	27	19.1	652
IKE	63	14.1	800
IKZE	48	6.6	476
PPK	18	12.0	3 000

Source: Polish Ministry of Finance, Polish Financial Supervision Authority data

There is a possibility to combine pension benefits with earnings after having reached the retirement age. Additional contributions are recalculated and increase the benefit. Prior to reaching the retirement age there are some restrictions regarding work/earnings.

1.1.2 Detailed description of the farmers' pension system

Farmers and their families are subject to compulsory social insurance which is managed by the Agricultural Social Insurance Fund (KRUS). In 2022, there were 1.1 million people who contributed to KRUS, while 1 million beneficiaries received pension benefits. The farmers' pension system is a DB system.

The statutory **retirement age** is the same as in the general system but the **minimum contributory period** is also obligatory to receive benefit (Table 1a).

TABLE 1A – QUALIFYING CONDITIONS FOR RETIREMENT IN THE FARMER'S PENSION SYSTEM

			2022	2030	2040	2050	2060	2070
Qualifying condition for retiring with a full pension	Statutory retirement age - men		65	65	65	65	65	65
	Statutory retirement age - women		60	60	60	60	60	60
	Minimum requirements	Contributory period – men	25	25	25	25	25	25
		Retirement age – men						
		Contributory period – women	25	25	25	25	25	25
		Retirement age – women						

Source: Polish Ministry of Finance

Pension insurance for farmers is financed from the Farmers Pension Fund. **The contribution** for old-age, disability and survivor pension insurance is payable quarterly and amounts to 30% of the minimum old-age pension. The proceeds from old-age and disability pension insurance contributions cover approximately 10% of the expenses for the old-age and disability pension insurance. An insured farmer is entitled to a farmer's old-age pension upon meeting the following conditions:

- He/she attained the retirement age: 60 years for women, 65 years for men
- He/she paid contribution to the old-age and disability pension insurance for at least 25 years.

A farmer's old-age pension is calculated in relation to the amount of minimum old-age pension and consists of a contribution part and a supplementary part. The contribution part depends on how long the farmer was subject to insurance. It is determined as 1% of the minimum old-age pension for each year of being subject to old-age and disability pension insurance. This part of the farmer's old-age pension is paid out regardless of cessation of agricultural activities, i.e., farm transfer. The supplementary part amounts to between 95% and 85% of the minimum old-age pension and decreases with the period of insurance. The supplementary part of the benefit is payable after the transfer of the farm.

It should be considered that Polish farms tend to be small. Most of the insured, about 89.6%, work on farms of up to 20 ha, and 57.1% in farms smaller than 5 ha. It is consistent with the results of the National Agriculture Census 2020 where the share of farms up to 5 ha amounted to 52.3% and share of farms up to 20 ha amounted to 89.2%. As a result, farmers' incomes are also relatively low and, in case of the smallest farms, not reported in detail. Owners of farms larger than 50 ha pay contributions two to almost six times higher than the base contribution but this group includes only about 2.2% of all contributors.

Pensions are indexed under the same rules as benefits in the general system.

1.1.3 Detailed description of the pension systems for security provision forces

The state budget entirely finances security provision systems without any contributions from the persons employed. This category is not one coherent system but comprises several different DB systems. These systems cover the police, army, fire-fighters, officers of the Government Protection Bureau, Internal Security Agency, Foreign Intelligence Agency, Polish Border Guard, prison guards, judges, and prosecutors. In total the benefits from these systems have been paid to 410 thousand persons in 2022 including 305 thousand of old-age pensions. Moreover, the reform introduced in 2012 divided the employed into two groups – those who were in service before 2013 and new professionals coming into service starting from January 1, 2013.

Under the old system, the amount of benefit is determined based on the amount of final salary or wage. One can retire after as little as 15 years of service and receive 40% of the last wage. The maximum benefit is 75% of the last wage. There is no minimum retirement age. After the 2012 reform of the system, the acquisition of retirement entitlements is possible only after 25 years of service.

The benefit amount is determined by the average salary or wage in ten calendar years selected by the employee. The pension cannot exceed 75% of the average wage from the ten chosen years.

TABLE 1B – QUALIFYING CONDITIONS FOR RETIREMENT IN SPECIAL PENSION SYSTEMS FOR SECURITY PROVISION FORCES

			2022	2030	2040	2050	2060	2070
Qualifying condition for retiring with a full pension		Statutory retirement age – men*	65	65	65	65	65	65
		Statutory retirement age – women*	60	60	60	60	60	60
	Minimum requirements	Contributory period – men	25	25	25	25	25	25
		Retirement age – men**	-	-	-	-	-	-
		Contributory period – women	25	25	25	25	25	25
		Retirement age – women**	-	-	-	-	-	-

*Source: Polish Ministry of Finance, *statutory retirement age in the justice system is the same as in general system, **the minimum required age for military services is not defined but a minimum contributory period of 25 years is required.*

Female judges and prosecutors with a career of at least 25 years are allowed to retire at the age of 60 and the age of 65 in the case of men who served as judges or prosecutors for at least 30 years. This retirement age limit aligns with the retirement age in the General Pension System. It should be added that the indexation rule of old benefits in this system is in general, the same as in the general system with one exception: the system for judges and prosecutors. In this system, full wage indexation is used.

1.2. Recent reforms of the pension system included in the projections.

Since the previous projection, there have been no significant changes in the regulations regarding public pension systems. The changes in the regulations introduced before 30/06/2023 listed below aim to improve the adequacy of future benefits, though without a significant impact on the projection results. Below you can find the list of these reforms.

Tax reduction
Pensioners are taxed according to the general taxation rules, excluding tax deductible expenses.

As of January 1, 2022 tax-free amount of the base for the calculation of the PIT significantly increased from PLN 3,090 (with some exceptions PLN 8,000) to PLN 30,000.

Also, the tax threshold was increased from PLN 85,528 to PLN 120,000. The tax rate in the first bracket of the tax scale was reduced from 17% to 12%. Due to the reform, there is a monthly net increase in disposable benefits.

Introduction of PIT 0 for taxpayers who have reached the statutory retirement age and continue to work.

From January 1, 2022 the personal income tax reduced for people who reach the statutory retirement age and do not decide to retire but continue to work. The solution is to exempt income from full-time work, mandate contracts and business activities from personal income tax up to PLN 85,528 per year for people who are over 60 years of age (women) and 65 years of age (men) and remain on the labour market without receiving retirement and disability benefits. The new tax relief will contribute to increasing pension benefits by extending the effective retirement age (due to longer contribution periods).

Higher benefit in the farmers' pension system

From March 1, 2023, a new definition of the basic pension in the agricultural social insurance system applies. After the changes, this benefit was linked to the lowest pension from the general system and amounts to 90%. As a result, the level of benefits increased substantially.

The pension projections reflect the legislation on the date 30/06/2023. There were also a few reforms introduced in the middle of the process of preparing predictions (after 30/06/2023). It was too late to include them in the calculations, but they are listed in Annex A3.

1.3. Description of the actual 'constant policy' assumptions used in the projection

According to Polish law, the indexation of minimum pensions is in line with the indexation of other benefits.
– CPI plus 20% of the real growth of average monthly earnings. Assumptions used in these projections are in line with the commonly agreed methodology, namely in line with the law for the first 10 years and then indexed to wage growth.

2. Overview of the demographic and labour force projections[4]

This part contains a description of the main demographic changes implied by EUROPOP2023 and the changes in the labour force as projected by the Cohort Simulation Model.

2.1. Demographic projections

According to the EUROPOP2023 demographic projections prepared by EUROSTAT, the Polish population will decline by approximately 6 million persons by 2070 (Table 2). The main cause of this change is a decline in the fertility rate (TFR). It decreased from a level close to ensuring a stable population in 1990 (2.06 live births per woman) to 1.39 in 2022. According to the EUROSTAT projections, fertility will increase to 1.61 in 2070 but will remain well below the natural replacement rate. The old-age dependency ratio is projected to increase from about 32% in 2022 to 64% in 2070. The second important driver of the population ageing in Poland is an increasing life expectancy, which should result from changes in lifestyle and the application of new medical technologies. In this respect, changes in life expectancy in Poland follow developments observed in countries that currently have the highest life expectancy.

According to the assumptions of the EUROPOP2023 population projections life expectancy at birth in Poland should increase in the years 2022-2070 by about 11 years for men and 8 years for women. This increase will be also a challenge for the pension system as the life expectancy at the age of 65 will increase by 7 years for men and 6 years for women. One significant change in the EUROPOP2023 projection in comparison to previous projections is the path of the net migration. In the EUROPOP2019 projection used in the 2021 Ageing Report, the net migration was assumed to constantly increase from about 19 thousand per annum in 2022 to more than 70 thousand per annum in 2070.

The outbreak of a full-scale war in Ukraine has caused an unexpected additional inflow of refugees from this country that changed dramatically the net migration assumptions in the first decade of the projection. According to Eurostat in 2022 the net migration amounted to about 1 million and 180 thousand in 2023 but for the subsequent years (2024-2033) it is predicted to be negative due to return migration to Ukraine or further migration of refugees. However, after 2035 the net migration trend will be similar as in the EUROPOP2019 projection positive values with the target value of 70 thousand in 2070 (additional Figure B).

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[4] For more details, see European Commission and EPC (2023), *'2024 Ageing Report: Underlying assumptions and projection methodologies.'* European Economy, Institutional Paper 257.

ADDITIONAL FIGURE B – THE ASSUMPTIONS REGARDING NET MIGRATION IN POLAND
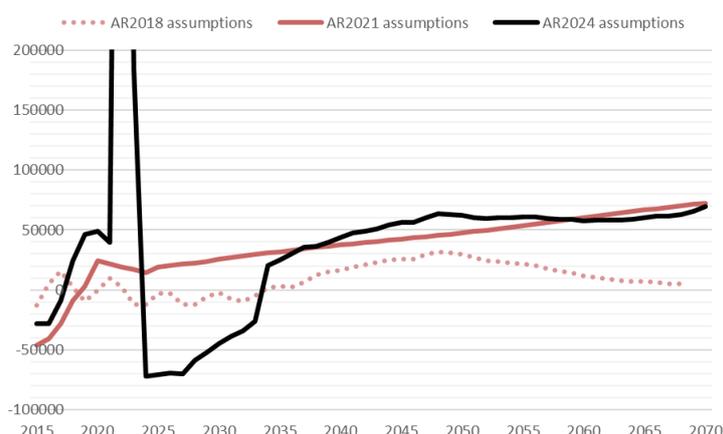
Source: EUROSTAT, EUROPOP 2023, EUROPOP 2021, For the clarity of the figure the value for the singe year 2022 is out of the scale as it reflects about 1 million war refugees.

TABLE 2 – MAIN DEMOGRAPHIC VARIABLES

	2022	2030	2040	2050	2060	2070	peak value	peak year	change 2022-2070
Population (thousand)	38 069	37 324	35 780	34 565	33 308	31 847	38 520	2023	-6 221
Population growth rate	0.9%	-0.5%	-0.4%	-0.3%	-0.4%	-0.5%	1.2%	2023	-1.3%
Old-age dependency ratio (pop 65+ / pop 20-64)	31.9	37.6	42.3	55.4	66.0	63.7	66.4	2062	31.9
Old-age dependency ratio (pop 75+ / pop 20-74)	10.1	14.9	19.2	21.4	29.8	34.5	34.5	2070	24.4
Ageing of the aged (pop 80+ / pop 65+)	22.4	24.7	35.3	30.9	36.0	46.7	46.7	2070	24.4
Men - Life expectancy at birth	73.2	75.7	78.1	80.3	82.3	84.1	84.1	2070	10.9
Women - Life expectancy at birth	81.3	83.2	85.0	86.6	88.1	89.5	89.5	2070	8.2
Men - Life expectancy at 65	15.4	17.1	18.5	19.9	21.2	22.4	22.4	2070	7.0
Women - Life expectancy at 65	19.8	21.3	22.7	23.9	25.0	26.1	26.1	2070	6.3
Men - Survivor rate at 65+	75.1	79.0	82.8	86.0	88.6	90.8	90.8	2070	15.7
Women - Survivor rate at 65+	89.5	91.1	92.6	93.9	94.9	95.7	95.7	2070	6.3
Men - Survivor rate at 80+	37.8	45.8	53.3	60.2	66.4	71.8	71.8	2070	34.1
Women - Survivor rate at 80+	63.5	69.6	74.5	78.8	82.4	85.4	85.4	2070	21.9
Net migration (thousand)	1000.9	-44.5	43.5	62.5	57.5	69.5	1000.9	2022	-931.4
Net migration (% population previous year)	2.7%	-0.1%	0.1%	0.2%	0.2%	0.2%	2.7%	2022	-2.4%

Source: Eurostat, European Commission.

The results of the pension projection for Poland (Figure 1) show that the current age structure of the Polish population is shaped by the two baby-boom generations: persons born after the WWII in the 1950s and its echo – persons born in the beginning of the 1980s. After about 50 years this kind of fluctuations in the age structure will disappear and persons in the age group 75+ will constitute a much higher population share than is currently the case.

FIGURE 1 – AGE STRUCTURE: 2022 VS 2070
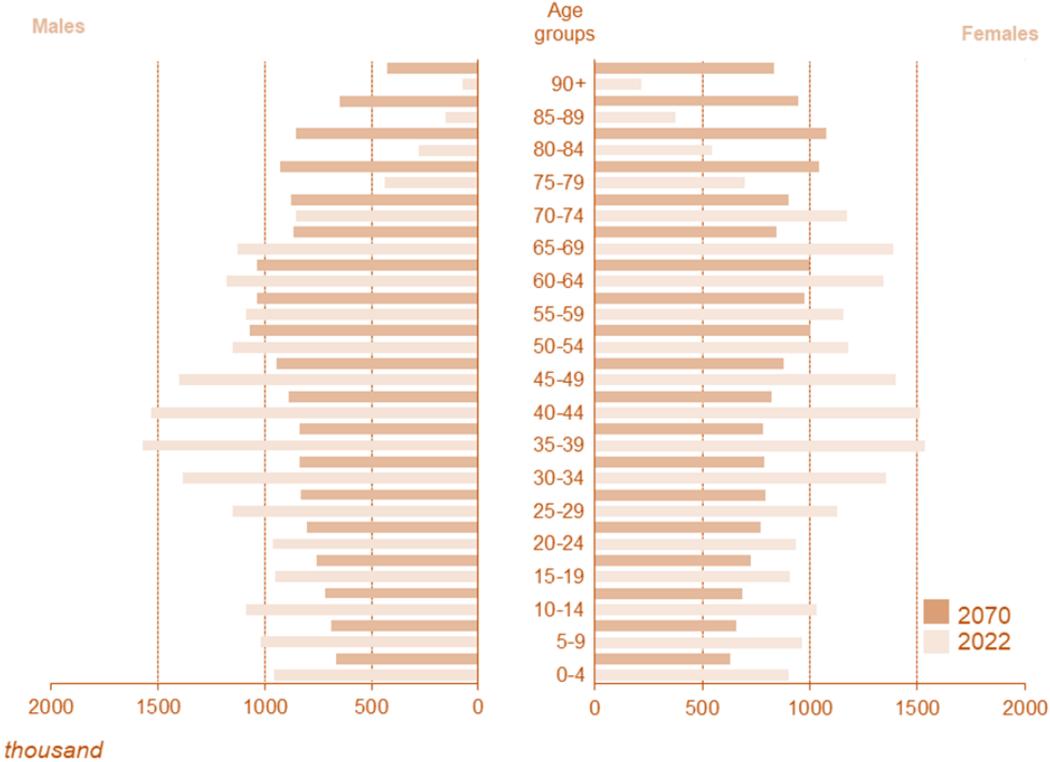
Source: Eurostat, European Commission

2.2. Labour force projections

Potential growth of the economies as well as number of contributors in the pension systems depend on labour supply. The labour supply projection for Poland is based on the population projection and the labour force participation rates for each age and sex group. Labour force participation rates (LFPRs) are predicted using the cohort simulation model (CSM) which considers the initial profiles of LFPRs, cohort effects and the potential impact of already introduced pension reforms on the exit age from the labour market of persons in pre-retirement age.

Due to a constant statutory retirement age (60/65), the changes of the LFPRs in the projection (Table 3) are driven by the population ageing (the increasing share of older persons both in the total population and inside the pre-retirement age group leads to lower LFPRs) and the convergence to higher labour force participation for pre-retirement ages which reflects trends observed in the past. In the next decades, further growth will be restrained as the baby-boom generation of the early 1980s will exit the labour market and statutory retirement ages remain constant.

TABLE 3 – PARTICIPATION RATE, EMPLOYMENT RATE AND SHARE OF WORKERS

	2022	2030	2040	2050	2060	2070	peak value	peak year	change 2022-2070
Labour force participation rate 20-64	79.1	80.0	78.5	78.7	80.0	79.3	80.2	2027	0.2
Employment rate of workers aged 20-64	76.9	78.0	76.1	76.3	77.6	76.9	78.6	2027	0.1
Share of workers aged 20-64 in the labour force 20-64	97.1	97.4	97.0	97.0	97.0	97.0	98.0	2027	-0.1
Labour force participation rate 20-74	67.6	68.4	67.5	63.7	64.7	67.0	68.9	2034	-0.6
Employment rate of workers aged 20-74	65.7	66.6	65.5	61.8	62.8	65.0	66.9	2034	-0.7
Share of workers aged 20-74 in the labour force 20-74	97.2	97.5	97.0	97.1	97.1	97.0	98.0	2027	-0.1
Labour force participation rate 55-64	57.8	61.2	61.6	60.1	61.0	61.9	63.3	2066	4.1
Employment rate of workers aged 55-64	56.8	60.2	60.4	58.9	59.8	60.7	62.1	2066	3.9
Share of workers aged 55-64 in the labour force 55-64	98.2	98.4	98.1	98.1	98.1	98.1	98.7	2027	0.0
Labour force participation rate 65-74	9.2	9.2	10.5	10.3	9.6	10.0	10.7	2042	0.8
Employment rate of workers aged 65-74	9.1	9.1	10.4	10.2	9.6	9.9	10.6	2042	0.8
Share of workers aged 65-74 in the labour force 65-74	99.1	99.2	99.0	99.0	99.0	99.1	99.3	2027	0.0
Median age of the labour force	40.0	43.0	44.0	42.0	42.0	43.0	44.0	2036	3.0

Source: European Commission

The raw projection using the cohort simulation method CSM assumes that the average labour market exit age will be constant both for men and for women as an effect of the constant retirement rate (Table 4). However, in addition this projection also assumes that despite constant retirement age there will be a decline in the early labour market exit in relation to exits at the retirement age or later.

Average contributory periods of the generations that reach the retirement age are going to fluctuate reflecting the fluctuations of the unemployment rates experienced by these cohorts during their life course and the changes in labour force participation rates of cohorts. The constant retirement age and increasing life expectancy assumed in the population projection led to the increasing relation between duration of retirement and duration of contributory period to the increase of the share of adult life spend at retirement.

TABLE 4 – LABOUR MARKET EXIT BEHAVIOUR

TOTAL	2022	2030	2040	2050	2060	2070	peak value	peak year	change 2022-2070
Average effective retirement age*	62.5	62.1	62.2	62.7	62.8	62.4	62.9	2056	-0.2
Average labour market exit age (CSM)**	63.0	63.0	63.0	63.0	63.0	63.0	63.0	2070	0.0
Contributory period	36.6	37.3	38.1	38.0	39.1	39.1	39.3	2062	2.5
Duration of retirement***	18.6	20.9	22.3	23.6	24.9	26.1	26.1	2070	7.6
Duration of retirement/contributory period	51%	56%	58%	62%	64%	67%	67%	2070	16%
Percentage of adult life spent in retirement****	30%	33%	34%	35%	37%	38%	38%	2070	8%
Early/late exit*****	54%	62%	70%	52%	46%	53%	74%	2036	-1%

MEN	2022	2030	2040	2050	2060	2070	peak value	peak year	change 2022-2070
Average effective retirement age*	64.2								
Average labour market exit age (CSM)**	64.5	64.5	64.5	64.5	64.5	64.5	64.5	2027	0.0
Contributory period	39.5	39.7	40.6	40.0	40.8	41.4	41.4	2068	1.9
Duration of retirement***	14.8	17.8	19.3	20.7	22.0	23.3	23.3	2070	8.5
Duration of retirement/contributory period	37%	45%	48%	52%	54%	56%	56%	2070	19%
Percentage of adult life spent in retirement****	24%	29%	30%	32%	33%	34%	34%	2070	10%
Early/late exit*****	92%	97%	115%	83%	73%	86%	122%	2037	-6%

WOMEN	2022	2030	2040	2050	2060	2070	peak value	peak year	change 2022-2070
Average effective retirement age*	61.1								
Average labour market exit age (CSM)**	61.6	61.6	61.6	61.6	61.6	61.6	61.6	2023	0.0
Contributory period	34.3	35.3	36.1	36.0	37.3	37.3	37.4	2062	3.0
Duration of retirement***	22.3	23.9	25.2	26.5	27.7	28.9	28.9	2070	6.6
Duration of retirement/contributory period	65%	68%	70%	74%	74%	77%	77%	2070	12%
Percentage of adult life spent in retirement****	35%	36%	38%	39%	40%	41%	41%	2070	6%
Early/late exit*****	16%	27%	26%	20%	19%	19%	28%	2033	4%

*Source: European Commission * The 'average effective retirement age' is the age at which people start receiving a pension benefit (old-age, early or disability). It is calculated on the basis of the administrative data on new pensioners for 2022, showing projected data for the other years for the total. ** 'Average labour market exit age (Cohort Simulation Model)' refers to 2023 instead of 2022. *** 'Duration of retirement' is the remaining life expectancy at the average labour market exit age. **** The 'percentage of adult life spent in retirement' is calculated as the ratio between the duration of retirement and the life expectancy minus 20 years. ***** 'Early/late exit' is the ratio between those who exit the labour market before reaching the statutory retirement age and those who exit at or beyond the statutory retirement age. For 2022, the value refers to 2023.*

3. Pension projection results

The aim of this chapter is the presentation of the results of the pension projections for Poland and the description of the main driving forces behind these results.

3.1 Coverage of the pension projections

The pension projections prepared for the purposes of the AWG cover all main pension systems in Poland: general pension system, farmers' pension system and security provision systems. The projection considers: public expenditures on old-age and other kind of old-age early pensions, disability, and survivor benefits in all schemes of the public pension system. The projection also includes the capital part of the general system (second pillar) with obligatory participation until 2014 and voluntary participation from 2014 until now.

The participation in OFE (second pillar) is voluntary because after 2014 contributors to general system had to choose between saving in OFE or direct transfer of the capital from the second pillar to the first pillar. However, even for persons who have chosen OFE, the capital collected in the individual accounts in this system is gradually transferred to ZUS before retirement age (safety slider) and pensions are paid by ZUS together with pensions from the first pillar. The third pillar (private and voluntary pension funds) has not been included.

The calculations made for the purposes of the AWG projections cover almost all pension expenditures included in the Eurostat ESSPROS database (Table 5). Since the AR 2021 projection, further efforts have been made to cover as many expenditures from the pension system as are covered in the ESSPROS database. However, some differences might remain due to the differences in the definitions and delays in data collection for farmers and military services. It should also be mentioned that the data for the last years are frequently revised.

TABLE 5 – ESSPROS AND AWG DEFINITION OF PENSION EXPENDITURE (%GDP)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	change 2013-2021
Eurostat total pension expenditure	12.1	11.9	11.6	11.5	11.0	11.0	10.9	11.4	10.9	-1.2
Eurostat public pension expenditure (A)	12.1	11.9	11.6	11.5	11.0	11.0	10.9	11.3	:	-0.8
Public pension expenditure (AWG: outcome) (B)	11.5	11.4	11.1	11.1	10.6	10.7	10.5	11.0	10.4	-1.1
Difference Eurostat/AWG: (A)-(B)	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.2	:	-0.3

Source: Eurostat, European Commission.

3.1. Overview of projection results

According to the new projections, the gross public pension expenditure-to-GDP ratio would remain broadly constant in the projection period (2022-2070) (Table 6). At 10.2% of GDP, pension expenditure was significantly lower in 2022 than in the previous exercise due to the discrepancy between projected and observed macro variables. The current projection shows first an increase in the expenditures in relation to GDP. The maximum value of 11.4% is reached in 2028. After that year the trend is declining and the value of expenditures to GDP in 2070 is only roughly like different from the value in 2022. The changes in the expenditures on pensions are closely related to the benefit ratios that are relatively immune to the population's age structure (due to NDC system). In the decade after

2022 the inflation rate is predicted to decline from the high level, so the benefit ratio will be supported by the indexation formula that base always on past year inflation and wage growth. In addition, benefit rate will be also influenced by the effects of the 13th pension (the additional benefit introduced permanently). In the longer time horizon, the total expenditures should decrease because of the replacement of pensioners with the old DB system benefits by pensioners with benefits calculated according to the DC formula.

In the Polish pension systems pension benefits are subject to taxes and other contributions, so part of the pension benefits return to the state budget and net pension expenditure is about 1.2 pps lower than the gross values and remain 1.2-1.3 pps below gross pension expenditure until the end of the projection. The contributions in the system consist mainly of the payments to the public system. The contributions to the private part of the system (FDC) play only a marginal role in the total system. The FDC private system is used for collecting contributions and capital management but not to pay benefits. Before the retirement age the capital from the individual pension accounts is transferred gradually to Social Security Institution (ZUS) and this institution pays pensions.

The balance of the public pension system, calculated as a difference between gross public pension expenditure and public pension contributions, is negative in the entire projection period. Before it starts to improve the balance of the public pension system will hit -3.2% of GDP in 2027, but then it improves to about -2.0% in 2042 and to -1.6% in 2070.

TABLE 6 – PROJECTED GROSS AND NET PENSION SPENDING AND CONTRIBUTIONS (%GDP)

	2022	2030	2040	2050	2060	2070	peak value	peak year	change 2022-2070
Expenditure									
Gross public pension expenditure	10.2	11.3	10.6	10.7	10.6	10.1	11.4	2028	-0.2
Private occupational pensions	:	:	:	:	:	:	:	:	:
Private individual mandatory pensions	:	:	:	:	:	:	:	:	:
Private individual non-mandatory pensions	:	:	:	:	:	:	:	:	:
Gross total pension expenditure	10.2	11.3	10.6	10.7	10.6	10.1	11.4	2028	-0.2
Net public pension expenditure*	9.0	9.9	9.3	9.4	9.3	8.8	9.9	2028	-0.2
Net total pension expenditure*	9.0	9.9	9.3	9.4	9.3	8.8	9.9	2028	-0.2
Contributions									
Public pension contributions	8.0	8.3	8.5	8.5	8.4	8.4	8.5	2042	0.4
Total pension contributions	8.2	8.4	8.5	8.5	8.4	8.4	8.5	2041	0.3
Balance of the public pension system (%GDP)**	-2.2%	-3.0%	-2.1%	-2.3%	-2.2%	-1.6%	-3.2%	2027	0.6%

Source: European Commission, EPC. *Net pension expenditure excludes taxes on pensions and compulsory social security contributions paid by beneficiaries. **Public pension contributions - gross public pension expenditure (peak value/year shows most negative value).*

The most important part of the total expenditures in the pension system are old-age pensions (Table 7). According to the projections, the level of expenditures on survivors and disability pensions (fluctuations do not exceed 1 pp) to GDP ratio will slightly decline over time. It reflects the relative change between preretirement age groups and the working-age population.

The pension expenditures of the general system in 2022 represent 87% of the total pension expenditures. The farmers' pension system and the security provision systems account each below 7% of the total pension expenditures. Further evolution of the expenditures in those systems reflect mainly the assumptions about the number of persons eligible to benefits in the future. In the case of the farmers' pension system, it is due to structural changes in the agriculture sector. To project the future number of persons employed in agriculture according to LFS we have used a cohort method similar to the method used by the AWG for preparing the labour force projections. The results show that the number of contributors to the farmers' system should gradually decrease from 1.1 million observed in 2022 to about 0.3 million in 2070.

TABLE 7 – GROSS PUBLIC PENSION SPENDING BY SCHEME (%GDP)

	2022	2030	2040	2050	2060	2070	peak value	peak year	change 2022-2070
Total public pensions	10.2	11.3	10.6	10.7	10.6	10.1	11.4	2028	-0.2
Old-age and early pensions	9.5	10.7	10.0	10.1	10.1	9.6	10.7	2028	0.1
Flat component	0.4	0.5	0.4	0.4	0.4	0.4	0.5	2028	0.0
Earnings-related	9.0	10.1	9.1	8.7	8.1	7.2	10.2	2028	-1.8
Minimum pensions (non-contributory)	0.1	0.1	0.4	1.0	1.6	2.0	2.0	2070	1.9
Disability pensions	0.4	0.4	0.4	0.4	0.4	0.4	0.4	2044	0.0
Survivor pensions	0.3	0.3	0.2	0.2	0.1	0.1	0.3	2022	-0.2
Other pensions	:	:	:	:	:	:	:	:	:

Special pension schemes & general system	2022	2030	2040	2050	2060	2070	peak value	peak year	change 2022-2070
Total	10.2	11.3	10.6	10.7	10.6	10.1	11.4	2028	-0.2
ZUS (general system)	8.9	10.1	9.4	9.6	9.6	9.1	10.2	2028	0.3
KRUS (farmers' pension system)	0.7	0.6	0.5	0.5	0.5	0.4	0.7	2022	-0.3
MIL (security provision systems)	0.7	0.6	0.7	0.7	0.6	0.5	0.7	2047	-0.2

Source: European Commission calculations based on data reported by Polish Ministry of Finance. In principle, the expenditures on old-age pensions in the general system (ZUS) are earnings-related (NDC). Moreover pensioners can receive two benefits that are not earnings-related: supplementary expenditures to top-up pensions to the minimum level and once a year additional benefit at the level equal to lowest pension (so called 13th pension for all pensioners). Both benefits are financed not from contributions but from the state budget. In August 2023 (too late to be included in the projection) another annual benefit has been introduced (so called 14th pension).

3.3 Description of main driving forces behind the projection results and their implications

This part provides more details about the development of public pension expenditures. The standard arithmetic decomposition of the pension expenditure-to–GDP ratio into dependency ratio, coverage ratio, benefit ratio, employment rate and labour intensity is explained in Figure 2. This breakdown shows the size of the challenge of the ageing process for old-age pensions and what the channels of adjustment in the pension system are.

FIGURE 2 – DISAGGREGATION OF PUBLIC PENSION EXPENDITURE

$$\frac{pension\ expenditure}{GDP} = \underbrace{\frac{population\ 65+}{population\ 20-64}}_{dependency\ ratio} \times \underbrace{\frac{number\ of\ pensioners}{population\ 65+}}_{coverage\ ratio} \times \underbrace{\frac{average\ pension\ income}{\frac{GDP}{hours\ worked\ 20-74}}}_{benefit\ ratio} \times \underbrace{\frac{population\ 20-64}{hours\ worked\ 20-74}}_{labour\ market\ effect} \quad [1]$$

$$\frac{number\ of\ pensioners}{population\ 65+} = \underbrace{\frac{number\ of\ pensioners\ 65+}{population\ 65+}}_{coverage\ ratio\ old-age} + \left(\underbrace{\frac{number\ of\ pensioners\ \leq 65}{population\ 50-64}}_{coverage\ ratio\ early-age} \times \underbrace{\frac{population\ 50-64}{population\ 65+}}_{cohort\ effect} \right) \quad [2]$$

$$\frac{population\ 20-64}{hours\ worked\ 20-74} = \underbrace{\frac{population\ 20-64}{employed\ people\ 20-64}}_{1/employment\ rate} \times \underbrace{\frac{employed\ people\ 20-64}{hours\ worked\ by\ people\ 20-64}}_{1/labour\ intensity} \times \underbrace{\frac{hours\ worked\ by\ people\ 20-64}{hours\ worked\ by\ people\ 20-74}}_{1/career\ shift} \quad [3]$$

Source: European Commission, EPC.

The results of the decomposition mentioned above are presented in Table 8. According to this decomposition, **population ageing (increasing dependency ratio)** is in absolute terms the main driving force behind the changes of pension expenditures in the period 2022-2070. Without any other adjustments that counteract the ageing process the pension expenditures would be about 8 pps of GDP higher in 2070 than in 2022. It should be mentioned that the entire dependency ratio growth is projected to appear until 2060 and it will be especially strong in the decades 2040-2050 and 2050-2060 reflecting the ageing process of the post war baby-boom generations. However, in the last decade of the projection the dependency ratio stabilises as most of the baby-boom generation will pass away and a gradual increase in fertility is projected to lead to a more balanced age distribution.

Due to already introduced reforms, the ratio of persons with pension benefits to the population 65+ (**coverage ratio effect**) is not going to be a major adjustment channel to population ageing. The negative contribution of this effect reflects mainly the limitation in the access to early pension benefits (coverage ration early-age) and fluctuations of the cohort effect in coverage of the pensions caused by the current less numerous generation in the pre-retirement age and the generations that will be in the 50-64 range after the baby-boom generation reach the retirement age after 2050. The statutory retirement age will remain constant. As in the previous projections, the main way of adjustment will be a decrease in the average pension in relation to the average wage (**benefit ratio effect).**

TABLE 8 – FACTORS BEHIND THE CHANGE IN PUBLIC PENSION EXPENDITURE BETWEEN 2022 AND 2070 (PPS OF GDP) – PENSIONERS[5]

	2022-30	2030-40	2040-50	2050-60	2060-70	2022-70
Public pensions to GDP	1.1	-0.7	0.1	-0.1	-0.6	-0.2
Dependency ratio effect	1.8	1.4	3.1	2.0	-0.4	7.9
Coverage ratio effect*	-0.5	0.1	-0.5	-0.6	0.0	-1.4
Coverage ratio old-age	0.2	0.1	0.0	-0.1	-0.1	0.2
Coverage ratio early-age	-2.5	-0.3	0.6	-1.1	-0.2	-3.6
Cohort effect	-0.6	0.7	-3.3	-2.5	1.2	-4.5
Benefit ratio effect	-0.1	-2.3	-2.0	-1.2	-0.4	-5.9
Labour market effect	-0.1	0.2	-0.1	-0.2	0.2	0.0
Employment ratio effect	-0.2	0.3	0.0	-0.2	0.1	0.0
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0
Career shift effect	0.0	0.0	-0.1	0.0	0.1	0.0
Residual	-0.1	-0.2	-0.3	-0.1	0.0	-0.7

*Source: European Commission, EPC. * Subcomponents of the coverage ratio effect do not add up necessarily.*

Both benefit ratios and replacement rates decline significantly in the projection period (Table 9). The **replacement rate** (first pension of those who retire each year over an (economy-wide) average wage at retirement) decreases from 58% in 2022 to about 27% in the year 2050 and stabilises at this level until 2070. The main reason for this decline is the adjustment in the pension formulas in the NDC system and the assumptions about increasing life expectancy combined with a constant retirement age. It should also be mentioned that even though since 2013 the pensions are calculated based on the NDC formula, it is influenced by the so called "initial capital" – the calculation of capital earned before the introduction of the pension reform in 1999 plus its indexation. Before the pension benefit calculation, the indexed initial capital is added to the NDC accounts of persons who worked before 1999. Before 1999, unemployment was relatively lower than in the early 2000s. Before 1989, the phenomenon of unemployment was officially not even observed (full employment in the centrally planned economy). This can explain why the projected replacement rate drops significantly after 2030 for generations who experienced unemployment, inactivity due to discouraged worker effect and increasing number of non-standard work agreements connected with low contributions to pension system (civil law contracts, self-employment).

The **benefit ratios** decrease in the first decade of the projection only moderately because in addition to the factors affecting replacement rates described above it also considers the indexation of the already granted benefits and other payments to already retired persons. However, in the decades after 2030 the benefit ratio is going to decline substantially because of the mechanisms in NDC system received by new pensioners that replaces the pensioners receiving benefits based on the DB schemes. The starting point for BR is lower than for RR because in 2022 average wages at retirement were lower than the average wage in the economy[6] and because benefits received by the oldest pensioners have been exposed for a long time to an indexation lower than wage growth (even if their initial values were

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[5] For the disaggregation based on the number of *pensions*, see Table A2 in the methodological annex.
[6] Economic research show that due to relatively low wage use of seniority-pay wage setting the wages in the Polish economy followed the inverted U shape distribution with decreasing level in the pre-retirement age.

higher -RR in the past higher than the current one). However, BR is converging to RR in the projection. Changes in next decades are mainly due to the assumptions about the labour market careers of the generations that reach the retirement age and the indexation of benefits at "constant policy". As agreed within the AWG, the indexation rules of the minimum pension benefits change from current regulations to full wage indexation after 10 years (see the definition of the constant policy). With time the coverage of the minimum pension will increase significantly.

The calculations regarding the comparison of the pension system dependency ratio (SDR) and demographic old-age dependency ratio (OADR) show to what extent the economic relations are going to be offset in comparison to purely demographic relations (Table 10). The changed assumptions regarding net migration has contributed to the lower OADR in the entire projection in comparison to the previous AWG projection AR2021. The SDR is also lower. It changes from 53% in 2022 to 93% in 2070. As a result, the measure of the system efficiency SDR/OADR decreases by 22 pps from 168% to 146%. The declining relation SDR/OADR can be explained by constant retirement age in the future.

On the other hand, the initial relation SDR / OADR is relatively high because of many pensioners relative to the number of people aged 65+ (statutory retirement age for women is 60 years) and a relatively low employment rate. Over time the employment rate is projected to increase (higher labour force participation in pre-retirement age group).

TABLE 9 – BENEFIT RATIO (BR), REPLACEMENT RATE AT RETIREMENT (RR) AND COVERAGE BY PENSION SCHEME (IN %)

	2022	2030	2040	2050	2060	2070	change 2022-2070 (pps)
Public scheme (BR)	45%	44%	35%	29%	26%	25%	-20%
*Coverage**	100%	100%	100%	100%	100%	100%	0%
Public scheme: old-age earnings related (BR)	47%	46%	37%	31%	27%	26%	-21%
Public scheme: old-age earnings related (RR)	58%	47%	32%	27%	27%	27%	-31%
*Coverage (NDC)**	87%	89%	86%	80%	76%	71%	-16%
Private occupational scheme (BR)	:	:	:	:	:	:	:
Private occupational scheme (RR)	:	:	:	:	:	:	:
Coverage	:	:	:	:	:	:	:
Private individual schemes (BR)	:	:	:	:	:	:	:
Private individual schemes (RR)	:	:	:	:	:	:	:
Coverage	:	:	:	:	:	:	:
Total benefit ratio	45%	44%	35%	29%	26%	25%	-20%
Total replacement rate (earnings-related benefits)	:	:	:	:	:	:	:

*Source: European Commission calculations on the basis of data reported by Polish Ministry of Finance. *Coverage of each pension scheme is calculated as a ratio of the number of pensioners within the scheme and the total number of pensioners in the country. In case data on pensioners are not available, the calculation is based on the number of pensions.*

TABLE 10 – SYSTEM DEPENDENCY RATIO AND OLD-AGE DEPENDENCY RATIO

	2022	2030	2040	2050	2060	2070	change 2022-2070
Number of pensioners (thousand) (I)	9696	10344	11200	12357	12557	11870	2174
Employment (thousand) (II)	18135	17511	16269	14558	13315	12787	-5349
Pension system dependency ratio (SDR) (I)/(II)	0.5	0.6	0.7	0.8	0.9	0.9	0.4
Number of people aged 65+ (thousand) (III)	7308	8197	8758	10143	10882	10245	2937
Working-age population 20-64 (thousand) (IV)	22946	21821	20711	18301	16491	16078	-6868
Old-age dependency ratio (OADR) (III)/(IV)	0.3	0.4	0.4	0.6	0.7	0.6	0.3
System efficiency (SDR/OADR)	1.7	1.6	1.6	1.5	1.4	1.5	-0.2

Source: European Commission calculations based on data reported by Polish Ministry of Finance

The changes in the ratios of the number of pensioners to the population and the number of pensioners to the number of inactive persons are driven mainly by the observed long-term trend of increasing labour force participation of older people (Tables 11, 12). The changes in the relation of the pensioners to population are mainly explained by the reforms that restricted access to early retirement. A decrease of the ratio of retired persons to population is consistent with an increasing labour force participation of persons in pre-retirement age. The coverage exceeding 100% in case of the groups above the pension age (60 years for women, 65 for men) can reflect three factors. First, there is a quite significant group of retirees who receive benefits and still work to increase their income. This is allowed and common in the agriculture sector. Second, it is possible (but on a very limited scale) to have simultaneous rights to benefits from different systems. Third factor are the possible entitlements to Polish pensions by emigrants from Poland. Those pensioners add to the number of total pensions despite not being included in the population of Poland. The second and third factors can explain the cohort specific phenomenon of persons that reach the age of 70-74 in 2022 and later. With time, when they are older these cohort of persons will also influence the age group 75+.

TABLE 11 – PUBLIC PENSIONERS TO (INACTIVE) POPULATION BY AGE GROUP (%)

pensioners / inactive population	2022	2030	2040	2050	2060	2070
Age group -54	5.6	5.0	4.2	3.5	3.4	3.1
Age group 55-59	60.5	52.4	49.6	46.7	46.5	45.4
Age group 60-64	100.3	98.2	96.9	92.4	90.1	91.5
Age group 65-69	112.1	114.6	118.1	116.0	111.8	112.9
Age group 70-74	107.9	106.4	108.2	108.6	105.4	103.9
Age group 75+	100.4	105.0	105.1	106.2	106.1	104.3

pensioners / total population	2022	2030	2040	2050	2060	2070
Age group -54	2.3	2.0	1.7	1.4	1.4	1.3
Age group 55-59	15.0	12.4	11.3	10.5	10.2	10.0
Age group 60-64	57.8	55.8	53.6	51.4	49.5	49.5
Age group 65-69	97.9	97.6	99.6	97.8	94.4	94.8
Age group 70-74	102.6	102.1	103.8	104.0	101.1	99.6
Age group 75+	100.4	105.0	105.1	106.2	106.1	104.3

Source: European Commission, EPC

TABLE 12 – FEMALE PENSIONERS TO (INACTIVE) POPULATION BY AGE GROUP (%)

female pensioners / inactive population	2022	2030	2040	2050	2060	2070
Age group -54	4.5	4.4	3.8	3.1	2.9	2.7
Age group 55-59	46.9	39.6	36.3	35.9	36.0	33.3
Age group 60-64	115.3	124.8	124.0	120.8	120.1	122.7
Age group 65-69	109.5	111.2	113.7	111.4	108.2	109.5
Age group 70-74	105.4	104.1	106.1	105.7	102.7	101.7
Age group 75+	99.6	104.4	104.6	105.4	104.9	103.2

female pensioners / total population	2022	2030	2040	2050	2060	2070
Age group -54	2.0	1.9	1.6	1.4	1.3	1.2
Age group 55-59	13.9	11.3	10.0	9.5	9.4	8.7
Age group 60-64	86.9	88.4	86.7	84.6	83.8	84.5
Age group 65-69	100.3	100.6	102.0	99.8	97.0	98.0
Age group 70-74	102.1	102.0	103.6	103.0	100.2	99.2
Age group 75+	99.6	104.4	104.6	105.4	104.9	103.2

Source: European Commission, EPC

The decomposition of the factors influencing the expenditures on new pensions provides insight into the mechanisms of the NDC general pension system in Poland (Table13). These tables provide the drivers behind the changes in the expenditure on new pensions. In the case of the Polish pension system this decomposition was prepared only for the general system based on the defined contribution (DC) principle. In this kind of systems, the expenditures on new pensions (P_{new}) can be calculated as follows:

$$P_{new} = \bar{C}_{new}\bar{A}_{new}\bar{PE}_{new}N_{new}$$ (Eq. 2)

where $\bar{C}_{new}$ is an average contributory period, $\bar{A}_{new}$ the average accrual rate of the new pensions (equal to the ratio of the contribution rate *c* to the annuity factor *A*), N_{new} is the number of new pensioners, and $\bar{PE}_{new}$ is monthly pensionable earning multiplied by average number of months paid in the first year. The expenditures on new pensions (in absolute terms) are growing in the entire period of the projection. The main driving forces behind these changes are: (1) the increasing value of the average pensionable wage in the whole projection horizon and (2) the number of new pensions, which increases sharply until 2050 reflecting ageing of the baby-boom generation. After 2060, the number of new pensions is expected to decline. The evolution of the monthly pensionable earnings in relation to the average wage reflects the labour market background of the generations. The generations that retire at the beginning of the projection spent a large part of their career in an environment of no or relatively low unemployment (before 1999). It is reflected in the so-called "initial capital" calculated for persons under the DB system, which worked before the introduction of the pension reform in 1999. The labour market entry of the younger generations who started their careers after 1999 coincided with relatively high unemployment. It is also important that a large part of these generations used options to reduce their taxable and thus pensionable income (civil law contracts, self-employment). These factors explain why the average pensionable income in the cohorts that move to retirement after 2040 is much lower than the cohorts that retire now.

TABLE 13 – BREAKDOWN OF NEW PUBLIC PENSION EXPENDITURE (OLD-AGE AND EARLY EARNINGS-RELATED PENSIONS)

TOTAL	2022	2030	2040	2050	2060	2070
Projected new pension expenditure (million EUR)*	1285	1915	2952	4069	4528	6801
I. Number of new pensions (1000)	302.0	300.0	395.0	402.0	297.0	299.0
II. Average contributory period (years)	36.6	37.3	38.1	38.0	39.1	39.1
III. Average accrual rate (%) (c/A)	1.0%	0.9%	0.9%	0.8%	0.8%	0.7%
Notional-accounts contribution rate (c)	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%
Annuity factor (A)	19.4	21.1	22.4	23.5	24.6	26.1
IV. Monthly average pensionable earnings (1000 EUR)	1.8	2.8	3.5	4.9	7.6	12.0
V. Sustainability/adjustment factors	1.0	1.0	1.0	1.0	1.0	1.0
VI. Average number of months paid the first year	6.5	6.5	6.5	6.5	6.5	6,5
Monthly average pensionable earnings / monthly economy-wide average wage	137%	121%	88%	78%	78%	84%

MEN	2022	2030	2040	2050	2060	2070
Projected new pension expenditure (million EUR)*	717	1078	1596	2246	2530	3312
I. Number of new pensions (1000)	134.0	133.0	171.0	197.0	152.0	134.0
II. Average contributory period (years)	39.5	39.7	40.6	40.0	40.8	41.4
III. Average accrual rate (%) (c/A)	1.1%	1.0%	1.0%	0.9%	0.9%	0.8%
Notional-accounts contribution rate (c)	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%
Annuity factor (A)	17.6	19.2	20.5	21.7	22.8	24.0
IV. Monthly average pensionable earnings (1000 EUR)	1.9	3.1	3.7	4.9	7.3	11.3
V. Sustainability/adjustment factors	1.0	1.0	1.0	1.0	1.0	1.0
VI. Average number of months paid the first year	6.5	6.5	6.5	6.5	6.5	6.5
Monthly average pensionable earnings / monthly economy-wide average wage	145%	131%	94%	77%	76%	80%

WOMEN	2022	2030	2040	2050	2060	2070
Projected new pension expenditure (million EUR)*	568	834	1345	1820	1997	3494
I. Number of new pensions (1000)	168.0	167.0	223.0	205.0	145.0	165.0
II. Average contributory period (years)	34.3	35.3	36.1	36.0	37.3	37.3
III. Average accrual rate (%) (c/A)	0.9%	0.9%	0.8%	0.8%	0.7%	0.7%
Notional-accounts contribution rate (c)	19.5%	19.5%	19.5%	19.5%	19.5%	19.5%
Annuity factor (A)	20.8	22.5	23.9	25.2	26.5	27.9
IV. Monthly average pensionable earnings (1000 EUR)	1.6	2.5	3.2	4.9	7.7	12.5
V. Sustainability/adjustment factors	1.0	1.0	1.0	1.0	1.0	1.0
VI. Average number of months paid the first year	6.5	6.5	6.5	6.5	6.5	6.5
Monthly average pensionable earnings / monthly economy-wide average wage	125%	107%	79%	78%	80%	88%

*Source: European Commission, EPC. *New pension expenditure equals the product of I, II, III, IV, V & VI.*

The difference in labour market careers and the effective retirement age creates significant differences between sexes. Women have, on average, lower pensionable earnings and much lower average contributory periods (because of the lower statutory retirement age and lower employment rates). In addition, lower retirement ages mean longer periods spent in retirement (even if the unisex life tables are used in the pension calculations). It should also be noted that due to changes in mortality the proportion of women at retirement age is significantly higher than that of men, which means that their pensions have a bigger impact on the total new pension expenditures.

3.4 Financing of the pension system

The level of pension contributions depends on the pension system. The level of contributions in the general system is described in Table 14. The contributions in the farmers' system are in principle flat and relatively low in comparison with contributions paid in the general system. There are no pension contributions in the security provision systems as these pensions are financed directly from the budget.

TABLE 14 – FINANCING OF THE PUBLIC PENSION SYSTEM

	Public employees	Private employees	Self-employed
Contribution base	Gross wage	Gross wage	Defined voluntarily within limitations
Contribution rate/contribution			
Employer	9.76%	9.76%	19.52%
Employee	9.76%	9.76%	
*State**	19.52%	19.52%	19.52%
*Other revenues**	Demographic Reserve Fund	Demographic Reserve Fund	Demographic Reserve Fund
Maximum contribution	30 times the average wage in the economy	30 times the average wage in the economy	30 times the average wage in the economy
Minimum contribution	-	-	60% of the average wage in the economy

*Source: European Commission, Polish Ministry of Finance; *Only legislated contributions are reported like for example: contributions from maternity leave benefits.*

The total contribution revenues (Table 15) are influenced mainly by macroeconomic and demographic assumptions (employment, wage growth, inflation). The relation between the number of contributors and the number of employed persons is slightly less than one because LFS data contain persons that are employed but do not pay contributions (example: shadow economy, some civil law contracts).

TABLE 15 – REVENUE FROM CONTRIBUTIONS AND NUMBER OF CONTRIBUTORS IN THE PUBLIC SCHEME

	2022	2030	2040	2050	2060	2070	change 2022-2070 (pps)
Public pension contributions (%GDP)	8.0	8.3	8.5	8.5	8.4	8.4	0.4
Employer contributions	*4.7*	*4.9*	*5.0*	*5.0*	*5.0*	*5.0*	*0.3*
Employee contributions	*3.0*	*3.1*	*3.2*	*3.2*	*3.2*	*3.2*	*0.3*
*State contribution**	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*	*0.2*	*0.0*
*Other revenues**	*0.2*	*0.2*	*0.2*	*0.0*	*0.0*	*0.0*	*-0.2*
Number of contributors (I) (1000)	17404	16831	15689	13947	12694	12123	-5281
Employment (II) (1000)	18135	17511	16269	14558	13315	12787	-5349
(I) / (II)	96%	96%	96%	96%	95%	95%	-1%

Source: European Commission, EPC

3.5 Public pension funds

Regarding the reserves of the public pension fund, there is the Demographic Reserve Fund in the general pension system. ZUS manages this fund and as a result the fund is classified as a public fund. The fund is continuously supplied with payments. Investment policy is regulated by law. FRD is not directly linked to balance of the pension system nor its value is calibrated in the way that guarantee that it is a full supplement to negative balance of pension system. Although its official aim is related to possible negative impact of demographic changes on pension expenditures, the use of the capital always requires a political decision. So, under the constant policy assumption we cannot assume that further decisions will be made in certain moment in the future to use the capital collected from inflows to the fund and from returns to capital collected in this fund.

TABLE 16 – PENSION FUNDS' POSITION AND RESERVES (%GDP) AND RETURN ON ASSETS (%)

	2022	2030	2040	2050	2060	2070	average 2022-2070
Stock of assets (end-of-year; %GDP)	1.5	2.2	3.9	5.6	7.4	9.2	5.0
Fund balance (million EUR)	936.9	2855.0	5650.6	8919.3	14832.3	25032.1	9204.8
Fund expenditure	123.2	1.0	2.0	5.0	10.0	17.0	29.8
Disbursements (to pension scheme)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other expenditure (incl. administrative costs)	123.0	1.0	2.0	5.0	10.0	17.0	29.8
Fund revenues	1060.1	2856.0	5652.6	8924.3	14842.3	25049.1	9233.6
Return on assets	292.5	1415.0	3584.6	6280.3	11124.3	19777.1	6630.9
Other income (incl. pension contributions)	768.0	1441.0	2068.0	2644.0	3718.0	5272.0	2602.7
Nominal rate of return	3.4%	6.5%	5.7%	4.7%	4.5%	4.5%	5.2%
Change in asset valuation (million EUR)	0.0	0.0	0.0	0.0	0.0	0.0	-0.0

Source: European Commission, EPC

3.6 Sensitivity analysis

The effects of different scenarios in sensitivity analysis are presented in Table 17. After the reforms introduced in 2014, pension expenditures from all mandatory schemes are paid by public institutions (ZUS, KRUS or directly from the budget), so total pension expenditures from mandatory pillars are equal to public pension expenditures.

The scenarios in the AWG 2024 exercise are divided into three groups: the results of the alternative demographic assumptions, the sensitivity tests for different paths of macroeconomic assumptions and the scenarios that require regulation changes (policy scenarios). Below we present their short description and differences resulting from their comparison to the baseline.

TABLE 17 – EXPENDITURE PROJECTIONS UNDER DIFFERENT SCENARIOS (PPS DEVIATION FROM BASELINE)[7]

Public pension expenditure/ Total pension expenditure*	2022	2030	2040	2050	2060	2070	change 2022-2070 (pps)
Baseline (%GDP)	10.2	11.3	10.6	10.7	10.6	10.1	-0.2
Higher life expectancy at birth (+2y)	0.0	0.0	0.1	0.2	0.2	0.3	0.3
Higher migration (+33%)	0.0	-0.1	-0.1	-0.2	-0.2	-0.1	-0.1
Lower migration (-33%)	0.0	0.1	0.1	0.2	0.2	0.1	0.1
Lower fertility (-20%)	0.0	0.0	0.0	0.2	0.5	0.8	0.8
Higher inflation scenario (2% by 2052)	0.0	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2
Higher employment rate of older workers (+10 pps)	0.0	-0.2	-0.3	-0.3	-0.2	-0.2	-0.2
Higher productivity (TFP converges to 1%)	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.2
Lower productivity (TFP converges to 0.6%)	0.0	0.0	0.1	0.3	0.3	0.3	0.3
Policy scenario: link retirement age to longevity	0.0	-0.3	-0.6	-0.9	-0.8	-1.1	-1.1
Policy scenario: constant retirement age**	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Policy scenario: constant benefit ratio	0.0	0.0	1.4	3.5	4.7	4.6	4.6

*Source: European Commission, EPC. *In the Polish pension system total pension expenditure and public pension expenditure are the same as pensions from FDC pension pillar are paid by public institution. **The baseline projection assumes constant retirement age as no policy change scenario.*

3.6.1 Alternative demographic assumptions

Four sensitivity tests have been considered regarding demographic variables: assuming an additional increase in life expectancy by 2 years and proportionally lower mortality, the two symmetric sensitivity tests regarding higher or lower migration (by 33%) and the scenario of a 20% lower fertility rate.

Higher life expectancy scenario – the gains in life expectancy in this scenario are mainly contributing to the increase of the length of the period in which the pensions are paid and only to a marginal extent to the increase of the potential labour force. In principle, in the NDC system, the increase in life expectancy should be automatically compensated by the adjustment of the replacement rate in the general system. The higher pension expenditure at the end of the projection (by 0.3 pps of GDP) can be explained by three factors. Firstly, the method of pension benefit calculation in the Polish system relies on life tables (and life expectancy) from the moment of retirement. If the prospective life expectancy is higher, then the expenditures paid to individuals surpass the amounts calculated in the system. So, not the entire life expectancy growth in this scenario can be compensated by the NDC system. Secondly, the level of pensions is influenced negatively by the life expectancy. And lower pensions lead to higher expenditures on minimum pensions. The third reason is that higher life expectancy directly affects expenditures in the special pension systems: farmers' pension system (defined benefit system) and security provision systems.

Lower/higher net migration – The recent huge change in net migration was one of the factors of the discrepancies between current and previous projections. The scenarios assuming higher / lower net migration in the future are related to the baseline migration path which is in EUROPOP2023 much more volatile than in EUROPOP2019 with the relatively long period of negative net migration due to the assumed return migration of refugees from Ukraine and later on, the dynamic return to

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[7] For more information on the design of the sensitivity scenarios, see Chapter 5 of Part I in European Commission and EPC (2023), '*2024 Ageing Report: Underlying assumptions and projection methodologies*', European Economy, Institutional Paper 257

significant and positive net migration. So, the impact of +/- 33% migration on pension expenditure is on average smaller than in the case of the stable positive net migration path predicted in EUROPOP 2019. However the direction of the influence remains unchanged. In the beginning higher/lower migration increases/decreases labour supply and contributions without significant influence on pension expenditures. With time immigrants move to retirement and it leads to the increase/decrease of pension expenditures to GDP ratio. The projected impact of an increase in immigration is a decrease of the pension benefits to GDP ratio by 0.1 pps in 2070 in comparison to the baseline. Lower migration leads to an increase of expenditures by 0.1 pps in comparison to the baseline.

Lower fertility – in the long run, the level of TFR is the main variable that influences the age distribution of the population[8]. However, the AWG projection is limited to the year 2070 and does not encompass the entire influence of the changes in TFR in the very long run (less numerous generations considered in this scenario are a maximum of 50 years old in 2070, so there is no effect on pension expenditures). What we observe in the projection horizon is a decrease in potential GDP growth due to less numerous generations that enter the labour market. This effect appears with a delay of about 20 years (it begins around the year 2040) and leads to a gradual increase in the gap in comparison to the baseline. At the end of the projection, the difference to the baseline amounts to 0.8 pps of GDP.

3.6.2 Alternative economic assumptions

The macroeconomic variables are characterized by large variability. To measure the sensitivity of the results to deviations from the baseline scenario the following scenarios have been proposed: higher/lower total factor productivity (TFP) growth, higher employment rate of persons in older age (55-74y) and higher inflation.

Higher/lower labour productivity and risk scenarios – Two scenarios are considered regarding future TFP path. The scenario of higher productivity assumes the convergence with TFP growth to 1.0% until 2070 (compared to 0.8% in the baseline) and the scenario of lower productivity that assumes the target value for the TFP growth convergence of 0.6%. Higher productivity has an influence on all systems through higher wage growth in the economy. In the general system it results in a higher accumulation of contributions (new pensions) and higher indexation (old benefits). Also, *higher labour productivity* accelerates GDP growth proportionally more than benefits because of the indexation rule of already granted benefits. The same mechanism explains the changes in security provision systems, while in case of the farmers' pension system even new benefits are indexed at below wage growth, which additionally decreases the proportion of expenditures to GDP. A higher labour productivity growth target value means a decrease of the expenditures related to GDP by 0.2 pps in comparison to baseline. A *lower labour productivity scenario* has the effect of opposite direction but of a bit higher magnitude.

Higher employment rate of older workers – a higher employment rate of older workers contributes to an overall higher employment rate, and it affects future expenditures in three ways: (1) it directly influences the total sum of contributions and thus the capital accumulated in defined contribution system by generations. It results in higher future liabilities of the public sector and higher calculated new pension benefits, (2) higher employment rates increase the accumulation of contributory period years in the pension system and decrease the share of persons that are not able to meet the minimum

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[8] According to the Lotka's stable population model (if all demographic rates are constant and with 0 net migration) the future shape of the age structure of population and intrinsic rate of growth is determined by TFR.

contributory period requirement to receive minimum pension benefits after reaching the retirement age, (3) increased labour force participation of persons in pre-retirement age means also lower take-up of early benefits. Higher employment directly increases GDP growth. As a result, higher employment means first a decrease of expenditures to GDP ratio but with time it may be also an increase in the ratio of expenditures to GDP when persons with longer life course careers are reaching retirement age.

Higher inflation – assumes slower convergence of the inflation rate to the target of the central bank in the future. In this scenario inflation rate of 3.5-5.2% (above the accepted interval around central bank target: 2.5% +/- 1pp.) remains persistent until 2042 in comparison to the baseline in which it returns to the target in the year 2027. The convergence to 2.5% (central bank target is achieved in the year 2052. The mechanics of the model is that higher inflation leads to lower pension expenditures to GDP as the indexation of benefits that considers inflation is delayed in comparison to the nominal GDP. Higher inflation also means relatively lower (in comparison to nominal wages) or delayed valorisation of the pension accounts in NDC system and influence also benefits in special pension systems. As a result the pension expenditures related to GDP are in 2070 lower by 0.2 pps.

3.6.3 Policy change scenarios

There are three scenarios that assume possible changes in regulations: unchanged retirement age, linking the retirement age to increases in life expectancy and offsetting declining pension benefit ratio.

Policy scenario: unchanged retirement age – in the case of Poland this scenario is in fact the baseline scenario as the constant policy assumes the constant statutory retirement age of 60 years for women and 65 years for men until the year 2070.

Policy scenario: linking retirement age to increases in life expectancy – the initial huge difference between statutory retirement age of men and women requires an assumption that the increase of the average retirement age will be due to the convergence of the retirement age of women and men. According to this assumption the same retirement age for men and women will be reached in 2030. After that the statutory retirement age for both sexes increases in line with the changes of the life expectancy of person in the age 65. Regarding the results, the higher statutory retirement age reduces public pension expenditures by 0.6 pps of GDP in 2030 and by 1.1 pps until 2070 . This is a result of the two effects: (1) it increases the average contributory period, (2) it shortens the average period when the old-age pension is paid. However, the reduction of the total amount paid at the individual level is permanent only in KRUS system. In the main ZUS system (NDC) the decrease in pension expenditures due to an increase in the retirement age is limited as longer work careers corresponds with higher accumulation of the implicit liabilities in the system. So, at the individual level, the increasing retirement age delays the payment of the accumulated liabilities but not the amount to be paid. On the other hand, the increasing retirement age improves the adequacy of the pension benefits and thus decrease the coverage of the minimum pension as more people (women) have benefits higher that the threshold. Due to this fact, the expenditures on minimum pension guarantee are substantially lower and the replacement rate decline is slower and stabilise at the higher level than in the baseline scenario.

Policy scenario: "constant benefit ratio"– the aim of this scenario is to simulate what would happen if the earnings-related public benefit ratio (BR) in the pension system (the relation of the average old-age pension to the average wage in the economy) is allowed to decline only by 10% in comparison to the level from 2022. This kind of scenario cannot be implemented directly to the NDC pension system because it assumes equivalence between contributions and pension benefits. So, the decline

of the replacement rate of new generations of pensioners is the main channel of adjustment assuming no changes of the retirement age. However, the recent reform (13th pension) that implemented in the system an additional annual benefit equal and universal for all pensioners can be seen as a potential tool for the simulation. We assumed hypothetically that in the future, when the benefit rate of the old age and early pensions decline by more than 90% in comparison to the level from 2022 this decline is counterbalanced by the additional annual payment from the state budget in the same amount for all pensioners who have already received their first pension. That is why the decomposition of the first pensions in this scenario remains the same as in the baseline scenario. The result of the simulation shows that because of the measures already implemented to keep the adequacy of the old-age pensions like increased indexation and implementation of the 13th pensions the benefit ratio will hit the 90% limitation for the first time around 2035 (in the previous AWG report it was the year 2030) and from this year additional payments will be required. Keeping the benefit ratio constant will generate considerable costs for the public finance even until 2040 (1.5 pps of GDP) and by 2060 the additional costs are increasing to 4.8pps. of GDP every year in addition to the baseline. In the last decade the additional expenditures required in this scenario decline slightly to 4.6 pps of GDP over the baseline scenario because of the decline in the number of pensioners.

3.7 Changes in comparison with previous Ageing Report projections

The comparison of the results of the current projection with those of the previous projections (Table 18) shows that the potential influence of the ageing process on the pension expenditures is decreasing as ageing has already materialised to some extent in the current age structure of the Polish population. As a result, the dependency ratio effect continues to decline in comparison to the previous projections and amounts to 8.1 pps of GDP in the current projection. Still, the main channel of adjustment of the pension system to the challenge created by the increasing dependency ratio is the predicted decrease of the benefit ratio. Other channels of adjustment are less important. In particular the offsetting effect of the coverage ratio amounts to only 1.5 pps as the statutory retirement age is assumed to remain constant in time and the inactivity in pre-retirement age is less pronounced problem than in the past.

TABLE 18 – DISAGGREGATION OF THE CHANGE IN THE PUBLIC PENSION EXPENDITURE-TO-GDP RATIO IN CONSECUTIVE AGEING REPORTS (PPS OF GDP)

	Public pension expenditure	Dependency ratio effect	Coverage ratio effect	Benefit ratio effect	Labour market effect	Residual (incl. interaction effect)
2006 Ageing Report (2004-2050)	**-5.7**	10.4	-5.7	-6.3	-3.2	-0.9
2009 Ageing Report (2007-2060)	**-2.8**	13.4	-6.3	-7.1	-1.0	-1.8
2012 Ageing Report (2010-2060)	**-2.0**	13.5	-5.9	-6.5	-0.9	-2.1
2015 Ageing Report (2013-2060)	**-0.7**	12.4	-5.2	-5.2	-1.4	-1.2
2018 Ageing Report (2016-2070)	**-1.0**	11.7	-3.0	-8.1	-0.4	-1.2
2021 Ageing Report (2019-2070)	**-0.2**	9.9	-2.4	-6.8	-0.1	-0.9
2024 Ageing Report (2022-2070)	**-0.2**	7.9	-1.4	-5.9	0.0	-0.7

Source: European Commission calculations based on data reported by Polish Ministry of Finance, The table presents the total change in public pension expenditure during the consecutive projection horizons and the contribution of the different components to that overall change. The disaggregation for 2006/2009/2012 is based on pensions, for 2015/2018/2021/2024 it is on the basis of pensioners. The projection horizon has been extended over consecutive Ageing Reports, limiting comparability over time.

The period between projections 2019-2022 was full of unexpected events that directly influenced macroeconomic indicators. In 2020 Polish economy experienced V-type recession because of unpreceded measures (lockdowns) applied to overcome the COVID-19 pandemic. However, this recession was not as deep and long-lasting as it had been predicted earlier. Secondly, in 2022 the outbreak of a full-scale war in Ukraine contributed to an enormous inflow of refugees from Ukraine to Poland. These persons, almost from the beginning of the conflict, were treated in the same way as citizens of Poland in terms of access to the Polish labour market and public services. As a result, this inflow created additional labour supply in the Polish labour market and created additional demand in the Polish economy. Very dynamic changes in inflation were another outcome of the COVID-19 pandemic and the global consequences of the Russian aggression in Ukraine. Increased inflation is transformed into indexation of pensions, but the mechanism works with a delay.

The comparison of the previous projections to the actual numbers shows a relatively high and increasing difference from the year 2020 until the base year in 2022 (Table 19). The assumptions of the previous projection were more pessimistic and finally, the total pension expenditures related to GDP were about 1.0 pp lower in 2020, 1.4 lower in 2021 and 1.8 pps in 2022. On the other hand, the new pension benefits were introduced as a regular payment to old-age pensioners and are included in the projections – the so-called "13th pension". In 2022 this direct transfer from the state budget to pensioners amounted to 0.4% of GDP.

TABLE 19 – DISAGGREGATION OF THE DIFFERENCE BETWEEN THE 2021 PROJECTIONS AND ACTUAL PUBLIC PENSION EXPENDITURE IN 2019-2022 (%GDP)

	2019	2020	2021	2022
Ageing Report 2021 projections (%GDP)	10.6	12.0	11.8	11.7
Assumptions (pps of GDP)	-0.1	-1.0	-1.4	-1.8
Coverage of projections (pps of GDP)	0.0	0.0	0.0	0.0
Constant policy impact (pps of GDP)	0.0	0.0	0.0	0.0
Policy-related impact (pps of GDP)	0.0	0.0	0.0	0.4
Actual public pension expenditure (%GDP)	10.5	11.0	10.4	10.2

Source: Own calculations based on the results of additional simulations of the pension models

The new projection assumes that the consequences of the extraordinary events that create discrepancies between earlier predictions and the new projection will disappear in the period until the year 2040 (Table 20). The increased migration of refugees in 2022 and 2023 is going to be offset by the increased return migration and the TFP growth rate is going to return to a path similar to the previous projection. The gradual return of inflation to the level acceptable for the monetary policy should be also accompanied by the adjustment of the indexation to a new price level. After 2040 the differences between the current and previous projections are once again increasing due to the predicted, more dynamic trend of the inflow of immigrants and due to slight changes in the modelling method (ie. slower than previously assumed outflow from the agriculture sector to the general system).

Regarding the policy-related changes - the "13th pension" is also predicted to remain a part of the pension system in the future and it will increase the total expenditures on pensions by about 0.4-0.5 pps GDP per annum.

TABLE 20 – DISAGGREGATION OF THE DIFFERENCE BETWEEN THE 2021 AND THE NEW PUBLIC PENSION PROJECTIONS (%GDP)

	2022	2030	2040	2050	2060	2070
Ageing Report 2021 projections	11.7	11.0	10.5	10.7	10.8	10.5
Change in assumptions (pps of GDP)	-1.8	-0.2	-0.2	-0.4	-0.5	-0.6
Improvement in the coverage or in the modelling (pps of GDP)	0.0	0.0	-0.1	0.0	-0.1	-0.2
Change in the interpretation of constant policy (pps of GDP)	0.0	0.0	0.0	0.0	0.0	0.0
Policy-related changes (pps of GDP)	0.4	0.5	0.4	0.4	0.4	0.4
New projections	10.2	11.3	10.6	10.7	10.6	10.1

Source: European Commission, EPC

4. Description of the pension projection model and the base data

4.1. Institutional context in which the projections are made

4.1.1 The general pension system (FUS model)

The main part of the Polish pension system has been modelled using the current version of pension model created and used in Polish Insurance Institution (ZUS). This model is used both for evaluation of new policy proposals and for preparations of regular long-term projections of pension expenditures like ZUS (2019) and ZUS (2020) published on the website of ZUS[9]. The results have been supplemented by the simulations carried out using additional microsimulation model.

4.1.2   Farmers' pension system model

Farmers' pension system was modelled using the PROST methodology developed by World Bank. This model has been created and serves as a tool in the Ministry of Finance. The AWG assumptions have been adjusted to create an input to this model.

4.1.3   Security provision systems model

Security provision pension systems was modelled using PROST methodology developed by World Bank. Separate models were prepared to model the systems with different regulations regarding pension formulas and minimum retirement age. All models have been created as tools in the Ministry of Finance. The AWG assumptions have been adjusted to create an input to these models.

4.2. Data used to run the model

Different models used the same set of assumptions prepared by AWG. As a supplement to assumptions the new long term projection of the employment in the agriculture sector was prepared using the methodology similar to the one applied in the CSM projections of the LFPRs. The parameters of the models have been estimated on the basis of the databases from ZUS, KRUS and security provision systems.

4.3. Reforms incorporated in the model

The models used in the AWG projection cover all public pension systems and reflect the reforms introduced not only recently but also in the distant past. The main pension reforms introduced between the years 2019 and 2022 are described in more detail in section 1.2. The construction of the pension system are described in the section 1.1.

4.4. General description of the models

Regarding the main ZUS model, the kernel of this model is a classical multiple decrement cohort-component actuarial model. Elemental calculation unit is "same-sex-and-age" cohort. The kernel is boosted with complementary modular sub-models projecting other benefit expenditures. The contribution revenue forecast is derived from past experience and projected changes in demographics and the labour market. The deterministic actuarial calculations were performed with an Excel and Visual Basic software. The model is updated on an annual basis. It covers four social

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[9] See: https://www.zus.pl/baza-wiedzy/statystyka/prognozy-fus

insurance schemes: old-age, disability, survivors and sickness plus accident insurance. The tool distinguishes between different mortality rates of certain types of benefit recipients. Main outputs of the model include standard fiscal indicators (expenditures, revenues, surplus/debt of the Social Insurance Fund) and various standard ratios (e.g. benefit ratio).

4.4.1 The general pension system (FUS model)

The model is based on AWG assumptions. The internal parameters are based on the relationships and observations observed in the databases of Polish contributors and benefit takers in the past years. The target population in the general system is based on the AWG population assumptions adjusted to take into account the number of persons who are not the target of that system (e.g. farmers and potential members of the security provision systems).

4.4.2 Farmers' pension system model

The AWG assumptions have been adjusted to create an input to this model. The projection of the number of contributors eligible for pensions in the future has been calculated on the basis of the farm employment projection prepared using the model similar to CSM model used by AWG in the predictions of the labour force participation rates projection[10]. The internal parameters of the model have been calculated on the basis of the databases provided by the institution responsible for payments from that system (KRUS).

4.4.3 Security provision systems model

The AWG assumptions have been adjusted to create an input to the models of the systems included in this category. The parameters for the age and sex groups have been calculated on the basis of the past observations in the data provided by the institutions responsible for payments from these systems.

4.5. Other features of the projection model

The consistency of the results between the projections generated by tools used in ZUS and PROST models of the farmer's pension systems and security provision systems is assured by the additional assumptions regarding number of new employees in these sectors. The share of new farmers in the young generations is going to decline according to the projection using CSM method. The relation of young employees entering the security provision occupations to the population remains constant in the projection.

10The description of the method is presented here: http://rocznikikae.sgh.waw.pl/p/roczniki_kae_z28_06.pdf

Methodological annex

The aim of this part is the presentation of additional assumptions that have been taken into account in the projections.

Economy-wide average wage at retirement

In principle, the construction of the ZUS pension model assumes flat age profile of wages. However the model, to some extent, reproduces currently observed differences between persons of different age and sex who apply for pension and the relation of their wages to the average wage. That is why its growth rate is almost the same as in the rest of the economy. The initial difference is a result of the currently observed difference between the average wage in the economy and wages of persons at retirement (Table A1). The slight differences in growth of the two categories of wages are generated by slight changes of the age structure of persons who apply for pension for the first in time.

TABLE A1 – ECONOMY-WIDE AVERAGE WAGE AT RETIREMENT (1000 EUR)

	2022	2030	2040	2050	2060	2070
Economy-wide average gross wage at retirement	13.5	25.0	42.9	68.1	104.2	156.8
Economy-wide average gross wage	15.6	28.2	47.6	75.5	115.8	170.6

Source: European Commission, ZUS (Polish Social Insurance Institution)

Pensioners vs pensions

In principle in all systems one pension should be given to every pensioner. A slightly higher number of pensions is a result of following exceptions:
- persons who receive pensions from more than one system.
- persons who receive survivor's and disability pensions at the same time (in the general system).

Pension taxation

The pension benefits in Poland are covered by the same regulations regarding personal income tax, like for example wage income. In line with the agreed AWG methodology, the effective tax rate on pension in the future remains constant and equal to effective tax rate from the year 2022.

Disability pensioners

The definitions of persons eligible for disability benefits are similar in all systems but in each of them there are different regulations regarding their level. In the recent years these regulation have not been changes but there is a visible tendency to more and more strict medical certification of the individual cases. When the statutory retirement age is reached the disability pensions are replaced by the old-age benefits.

Survivors' pensions

The modelling of the survivors' pensions is based on the trends of the parameters observed in the databases of the institutions responsible for payments in the previous years.

Non-earnings-related minimum pension

The minimum pension is an additional guarantee in the Polish pension system. This is an instrument to top up the lacking part of the pension benefits for persons who collected too little retirement capital to have a benefit lower or equal to the minimum pension. It can be paid to persons covered by the general system who reached the statutory retirement age and have the required minimum contributory period of 25 years for men and 20 years for women.

Contributions

The contribution rates in the general system (ZUS) and in the farmer's system (KRUS) are assumed to be constant in time.

Alternative pension spending disaggregation

Table A2 provides alternative disaggregation of the forces behind changes in public pension expenditures but based on the data on pensions and not pensioners like Table 8. The main message about the channels of adjustment to the increasing dependency ratio remains the same as there is only a slight difference between the number of pensions and number of pensioners in the projections.

TABLE A2 – FACTORS BEHIND THE CHANGE IN PUBLIC PENSION EXPENDITURE BETWEEN 2022 AND 2070 (PPS OF GDP) – PENSIONS

	2022-30	2030-40	2040-50	2050-60	2060-70	2022-70
Public pensions to GDP	1.1	-0.7	0.1	-0.1	-0.6	-0.2
Dependency ratio effect	1.6	1.4	3.1	2.0	-0.4	7.6
Coverage ratio effect*	-0.4	0.1	-0.5	-0.6	0.0	-1.4
Coverage ratio old-age	0.2	0.1	0.0	-0.1	-0.1	0.0
Coverage ratio early-age	-2.1	-0.3	0.6	-1.1	-0.2	-3.2
Cohort effect	-0.4	0.7	-3.3	-2.5	1.2	-4.3
Benefit ratio effect	-0.1	-2.3	-2.0	-1.2	-0.4	-5.9
Labour market effect	-0.1	0.2	-0.1	-0.2	0.2	0.0
Employment ratio effect	-0.1	0.3	0.0	-0.2	0.1	0.0
Labour intensity effect	0.0	0.0	0.0	0.0	0.0	0.0
Career shift effect	0.0	0.0	-0.1	0.0	0.1	0.0
Residual	0.1	-0.2	-0.3	-0.1	0.0	-0.5

Source: European Commission calculations based on data reported by Polish Ministry of Finance,
*Subcomponents of the coverage ratio effect do not add up necessarily.

Annexes

A1. Additional information regarding the changes in farmers pensions

FIGURE A1 - NUMBER OF INSURED BY FARM SIZE IN THOUSANDS BY FARM SIZE (AS OF DECEMBER 31, 2022)
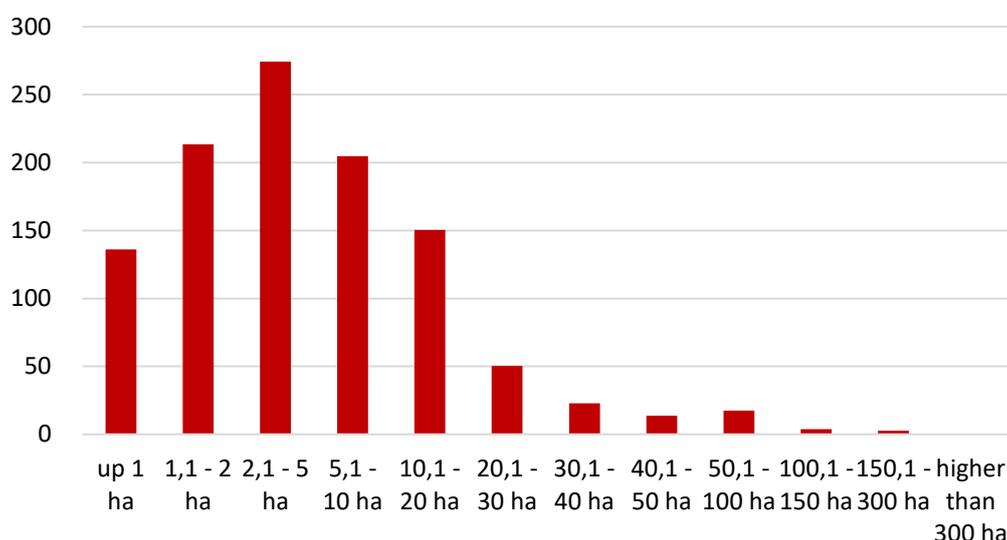
Source: Polish Ministry of Finance and Agricultural Social Insurance Fund

Compared to the previous projection, the share of farmers with farms of 5 to 20 hectares has decreased, while the share of smaller farmers (up to 5 ha) and larger (over 50 ha) has increased. Observing the data from recent years, we notice that farmer's system is expiring.

TABLE A4 - NUMBER OF FARMER CONTRIBUTORS IN 2010-2022 (IN THOUSANDS)

year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
number	1520	1502	1482	1460	1452	1434	1321	1295	1273	1187	1161	1123	1081

Source: Polish Ministry of Finance and Agricultural Social Insurance Fund

Therefore, referring to the discussion about the need to reform this system, one should look at the problem much more broadly. Not only from the point of view of the social security system, but above all, from the point of view of the labour market, which is changing, causing more and more people to move to employment and become covered by the general system, which we assume in our forecasts. If we look at the age structure of the insured, it turns out that the greatest number of people is over 46. In the event of introducing a possible reform, the oldest participants of the system should be excluded from the new solutions, as is the case with most introduced reforms. Therefore, taking into account the changes in employment in agriculture, the age structure of current farmers, the transitional period could turn out that the reform would cover a small group of the insured. Therefore, no changes to the farmers' insurance system are planned in the near future.

FIGURE A2 - NUMBER OF FARMER'S CONTRIBUTORS BY AGE GROUPS (THOUSANDS IN 2022)
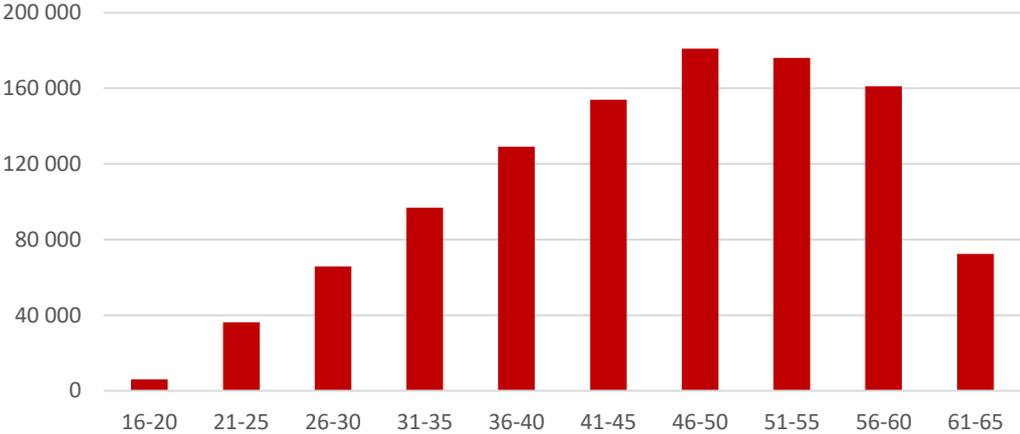
Source: Polish Ministry of Finance and Agricultural Social Insurance Fund

A2. More extended description of the special systems covered by the general system

There are special pension systems in the Polish pension system, such as bridging pensions, teachers' compensatory benefits and pre-retirement benefits. These systems are expiring systems and have not been included in the current projection.

Old-age bridging pension

The right to an old-age bridging pension is acquired by an employee who meets jointly the following conditions:

• was born after 31 December 1948,
• has completed a period of employment in special conditions or of a special character of at least 15 years,
• has reached at least the age of 55 years (woman) and 60 years (man),
• has completed the insurance period (contributory and non-contributory) of at least 20 years (woman) and 25 years (man),
• after 31 December 2008 performed work in special conditions or of a special character,
• has terminated his/her employment relationship.

The old-age bridging pensions are financed mainly by the state budget. A part of the costs is covered by employers from the contribution transferred to the Old-Age Bridging Pensions Fund. In 2022 the old-age bridging pensions were paid by ZUS to an average of ca 39.1 thousand pensioners. The average amount of the pension was PLN 3815. The expenditure on old-age bridging pensions in 2022 was PLN 1.788 million.

The Act of July 28, 2023 amending the Act on Bridge Pensions abolished the expiring nature of bridge pensions. The change will be effective from January 1, 2024.

Teacher's Compensatory Benefit

A person who has worked as a teacher, tutor or other educator can apply for the teacher's compensatory benefit if the following conditions are met:

• has reached a certain age, that is:
  o women: at least 55 years - by the end of 2024, at least 56 years - in the years 2025–2026, at least 57 years - in the years 2027–2028, at least 58 years - in the years 2029-2030, at least 59 years - in the years 2031-2032,
  o men: at least 55 years - by the end of 2014, at least 56 years - in the years 2015-2016, at least 57 years - in the years 2017-2018, at least 58 years - in the years 2019-2020, at least 59 years - in the years 2021-2022, at least 60 years - in the years 2023-2024, at least 61 years - in the years 2025–2026, at least 62 years - in the years 2027–2028, at least 63 years - in the years 2029-2030, at least 64 years - in the years 2031–2032,
• has at least 30 years of work experience, i.e. contributory and non-contributory periods, including having had at least 20 years of teaching work with at least 1/2 of the compulsory number of lessons,
• terminates (or has terminated) their employment upon their own request or it has ended under certain circumstances.

The teacher's compensatory benefit is financed by the state budget. In 2022 the benefits were paid by ZUS to an average of ca 13.3 thousand pensioners. The average amount of the pension was PLN 2924. The expenditure in 2022 was PLN 465 million.

Pre-retirement benefit

The pre-retirement benefit is granted to a person who has the status of an unemployed person and meets the conditions concerning, inter alia, the mode of employment relationship termination, age and insurance period. A person who is in one of special seven situations will be entitled to the pre-retirement benefit if he/she has been receiving unemployment benefit for at least 180 days and meets all of the following conditions:

- is still registered as an unemployed person,
- within the period of receiving unemployment benefit did not refuse, without justified reason, a proposal of suitable employment or other gainful work or intervention works and public works,
- submits an application for the pre-retirement benefit within 30 days from the day of issue by the poviat (district) labour office of a document certifying the 180-day period of receiving the unemployment benefit.

As of 1 March 2022, the amount of the pre-retirement benefit is PLN 1,350.77 and is subject to periodic adjustment. In 2022, ZUS paid the pre-retirement benefits to 49 thousand people. The total amount of benefits was PLN 767 million. These benefits are financed from the Labour Fund.

A3. New legal regulations that have not been considered in this projection.

14th pension

The Act on another additional annual cash benefit for pensioners (published on July 24, 2023) introduced another benefit: the so-called the 14th pension for 10 years. Another additional benefit in the amount of at least the lowest gross pension will be received by a person whose benefit does not exceed PLN 2,900. If the benefit is higher than PLN 2,900, the 14th pension will be reduced by the amount exceeding this threshold. If the amount of the additional benefit is lower than PLN 50, the additional benefit will not be granted.

The Act provides for the possibility of determining a higher amount of the 14th pension. The Council of Ministers, no later than by October 31 of a given year, by way of regulation, will be able to determine a higher amount of the next additional annual cash benefit than the amount of the lowest pension. In 2023 the amount of the 14th pension was increased from PLN 1,588.44 (the lowest pension applicable from March 2023) to PLN 2,650.

According to the government project, the expenses for the 14th pension over 10 years are presented below

year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
gross public spending (% GDP)	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2

Early retirement for some teachers

The Act of July 28, 2023 amending the Act - Teacher's Card introduced early retirement for teachers. The new regulations apply to teachers who:
- started working as a teaching employee before January 1, 1999;
- have a documented contribution period of at least 30 years, including at least 20 years of "work on the board";
- the benefit amount calculated by them will not be lower than the minimum pension amount.
Teachers will be able to retire under special conditions, starting from September 1, 2024 (teachers born before September 1, 1966); from September 1, 2025 (teachers born after August 31, 1966 and before September 1, 1969); from September 1, 2026 (teachers born after August 31, 1969).