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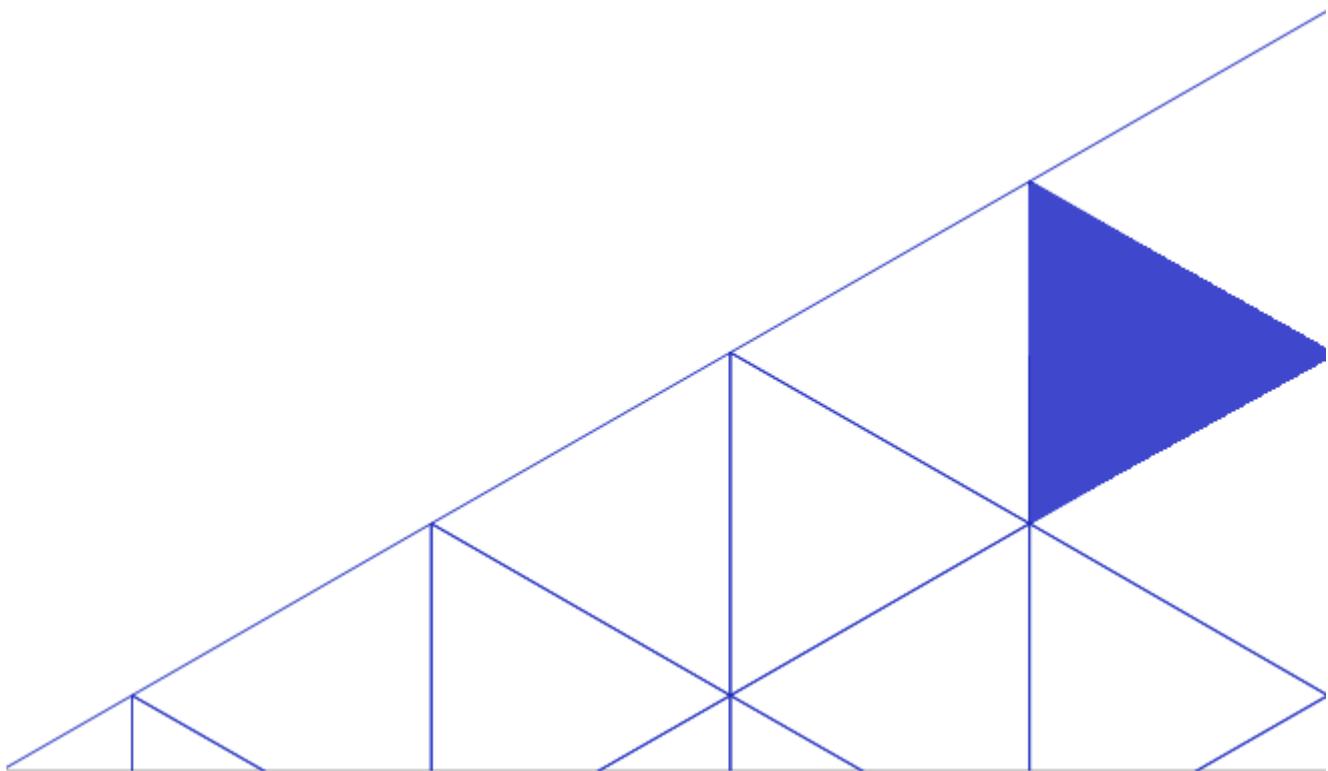
JORDAN

▶ Report to the Government

11th Actuarial Review of the Social Security Corporation as at 31 December 2023

March 2025

Printed in Switzerland

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▶ Abbreviations and acronyms

GAP	General average premium
GDP	Gross domestic product
ILO	International Labour Office / Organisation
JOD	Jordanian dinar
OADDI	Old-age, disability and death insurance
PAYG	Pay-as-you-go
SEP	Self-employed person
SSIF	Social Security Investment Fund
SSC	Social Security Corporation
TFR	Total fertility rate
UNWPP	United Nations World Population Prospects
WI	Work injury

▶ Foreword

This report is a key output of the ILO technical assistance provided in the context of a trust-in-fund agreement between the Government of Jordan, represented by the Social Security Corporation (SSC) and the ILO.

In accordance with Article 18(a) of Law No. 1 of 2014, an actuarial review of the social security system of Jordan must be undertaken at regular intervals. The 10th actuarial review was realised by the ILO as at 31 December 2019. This 11th actuarial review is performed as at 31 December 2023.

An Interim Technical Note was delivered previously under the project to present the experience analysis of the scheme, the actuarial bases, and the demographic and macroeconomic framework of the actuarial review.

▶ Acknowledgements

This project is realised under the general coordination of Mr. Luca Pellerano, Senior Regional Social Security Specialist at the Regional Office for Arab States. The actuarial supervision of the valuation is undertaken by Mr. André Picard, Chief Technical Adviser and Head of the Actuarial Services Unit of the Social Protection Department of the ILO. The draft note was prepared by Mr. Pierre Plamondon, Senior Actuary, and Mr. Raphaël Imbeault, Actuary and Modelling Expert. Technical support was provided by Mr. Dennis Aguilar, Actuarial Modelling Specialist.

The ILO team of actuaries benefited from the assistance of the Actuarial Studies Directorate of the SSC to whom it expresses its deep gratitude, in particular to Mr. Ahmed Obaid, Head of the Actuarial Studies Directorate and Mr. Mohammed Noor Khrais, Head of Research and Studies Department. The personnel of the SSC supplied the dataset and information as requested.

The Director-General of the ILO extends his gratitude to Dr. Mohammad Salih Al Tarawneh, Director General of the Social Security Corporation, for his trust in the ILO in carrying out this actuarial review.

▶ Executive summary

The present actuarial review covers the 3-year period ending 31 December 2023 and presents a projection of the financial situation of the Social Security Corporation for the next 90 years. The actuarial review is based on the legal provisions of Law No. 1 of 2014, including subsequent amendments to the law.

Experience of the SSC since the last actuarial review

Over the 4-year period 2020-2023, contribution income exceeded total expenditures by JOD436 million per year on average for the combined OADDI, Work injury and Maternity branches.

The number of contributors increased by 12 per cent between 2019 and 2023 (11 per cent for males and 14 per cent for females), which is lower than the 20 per cent increase projected for that period in the last actuarial valuation. Over the 4-year period, the salary increase was 10.2 per cent for males and 13.1 per cent for females. More important increases affected participants in the civil service. The number of new retirees (new pensioners and beneficiaries of retirement grants) was significantly higher than projected over the last four years.

At the end of 2023, SSC accumulated funds are 9 per cent lower than projected. The average rate of return of the social security fund period was 5.8 per cent over the last 4 years, compared to an average return of 3.8 per cent assumed in the 10th actuarial review for the same period.

Demographic pressure

According to the general demographic assumptions established for this valuation, the total population of Jordan is projected to increase by 55 per cent between 2024 and 2070, from 11,530,973 in 2024 to 17,895,531 in 2070, and stabilize thereafter. The number of persons at pensionable age (60 and over) will grow from 788,215 in 2024 to 4,310,938 in 2070 and 6,139,363 in 2100. The ratio of the number of working-age persons (16-59) to the number of persons aged 60 and over will fall from 8.8 to 1.5 over the next 75 years.

SSC demographic and financial projections

▶ Increase of scheme's demographic ratio

As a direct consequence of the ageing of Jordan's total population and assumptions on future SSC coverage, the number of contributors to the scheme will increase by a factor of 2.2 over the period 2024-2100, while the total number of beneficiaries will increase by a factor of 12.5. Consequently, the ratio of contributors to beneficiaries will decrease from 4.5 in 2024 to 1.6 in 2060 and 0.8 in 2100. This is one of the main factors leading to a substantial increase of the cost of the scheme over future decades.

▶ Old-age, disability and death insurance (OADDI)

In 2024, OADDI funds represent 9.1 times the annual expenditure of the branch. The pay-as-you-go cost rate (the ratio of total expenditure to total insurable earnings in a given year) is 16.0 percent in 2024, but this ratio will increase significantly after 2030, at the time the scheme will experience a sharp increase in the number of pensioners. The PAYG cost rate continues to increase thereafter, reaching 39.4 per cent in 2060 and 68.5 per cent in 2100 because of the stagnation of the number of contributors in the long term, while the number of beneficiaries continues to increase.

In 2030, the OADDI branch expenditures will first exceed contributions. Expenditures will become larger than the total of contributions plus investment income in 2038 and the reserve will then start to decrease. The OADDI reserve is projected to be exhausted in 2050.

▶ **Table ES.1. Key dates of the future evolution of OADDI reserve**

	Year
Scheme's expenditure first exceeds contributions (investment income must be used to support expenditures)	2030
Scheme's expenditure first exceeds contributions plus investment income (reserve starts to decrease)	2038
Reserve is exhausted	2050

As illustrated in Figure ES.1, the PAYG cost rate of the OADDI branch will exceed 50 per cent from 2071 onwards.

The general average premium (GAP) represents the constant contribution rate necessary to finance all OADDI benefits over a certain period. When calculated over a period of 90 years (from 2020 to 2109), it is estimated at 44.8 percent. The GAP may be compared to the average contribution rate of the scheme (allocated to the OADDI branch) that will converge to 18.3 percent of insured earnings in long term. These observations confirm that additional contribution rate increases and/or modifications to benefits will be necessary to ensure the long-term financial sustainability of the OADDI branch.

▶ **Figure ES.1. Projected cost rates, as percentage of insurable earnings, 2024-2100**
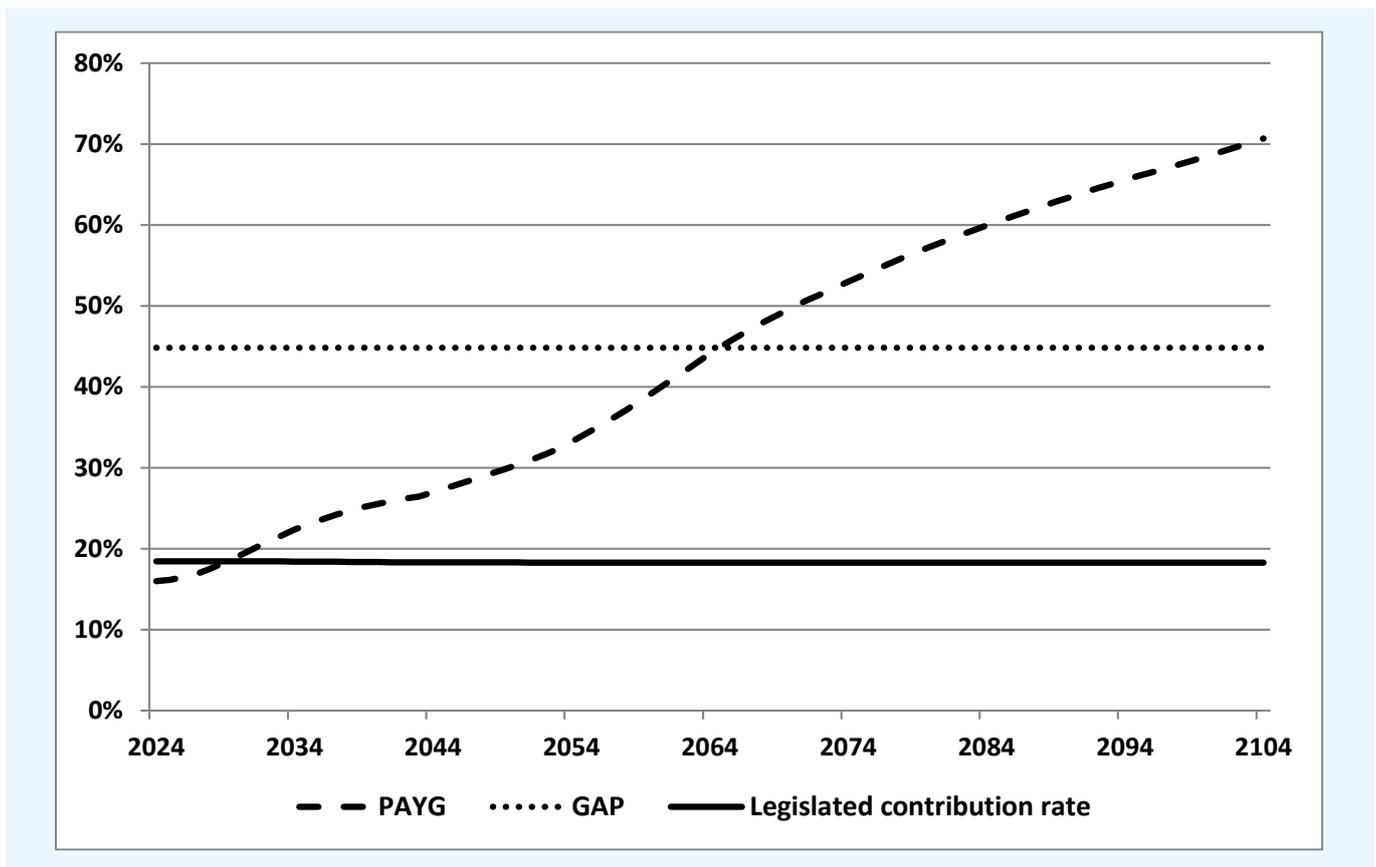
The GAP calculated over 90 years is higher in the 11th valuation (44.8 percent) compared to the 10th valuation (37.5 percent). The main factors that explain the increase are (1) the difference in the number and structure of the insured population as of the valuation date, (2) salary growth assumptions, and (3) assumptions regarding the future increases of life expectancy.

▶ **Work injury (WI) benefits**

The contribution rate allocated to the WI branch is more than sufficient to support its benefit expenditures. The SSC should evaluate the performance of the scheme (claiming process, reporting of claims). This could lead to considering a reduction the contribution rate of the WI branch and re-allocating the difference to the OADDI branch.

▶ **Maternity benefits**

The projected number of beneficiaries is slightly higher than 13,000 in 2024, but it increases rapidly thereafter in line with (1) the shrinking of the gap between the fertility of SSC insured women and the fertility of the general population, and (2) the increase of the population of SSC insured women. Around 45,000 beneficiaries are projected in 2070.

The contribution rate of 0.75 percent allocated to the branch is more than sufficient to support its projected expenditures. The contribution rate may be compared to the general average premium (GAP) of 0.30 percent associated with this branch.

▶ **Unemployment benefits**

It is projected that the number of persons collecting Unemployment benefits will increase from 36,917 in 2024 to 52,754 in 2030. Fund accumulations are projected over time given the legal constraints on the collection of benefits (only three months of allowance during the first 15 years of operation of the scheme, and a maximum of three unemployment benefit spells during the career).

The financial projections of this branch are not very useful from an actuarial perspective since the Unemployment scheme is just a savings mechanism that allows certain withdrawals during the career (in case of unemployment) and pays back the accumulated account at retirement. The aggregate value of the Unemployment benefit fund will thus always be in balance since, for SSC, any individual withdrawal will either come from the person's accumulated savings or be recovered from benefits due to the person.

The SSC's financial reporting should thus indicate that, *de facto*, the individual unemployment accounts as well as the aggregate Unemployment Fund represent funds held in trust. Those funds are not available to support the costs of any other component of the social security scheme, either pensions, work injury or maternity insurance.

The ILO reiterates that the SSC Unemployment benefit scheme does not involve any form of risk pooling. In addition, contrary to unemployment insurance principles, benefits are paid no matter if the person is looking or even available for a job. Hence the SSC Unemployment scheme does not meet the requirements of ILO Convention 102 (Social Security Minimum Standards) and Convention 168 (Employment Promotion and Protection Against Unemployment).

Sensitivity tests

The report presents different simulations to show the impact of modifying certain critical assumptions used for pension projections. Tests are performed on (1) the coverage rate, (2) the real wage increase, (3) the rate of return of the fund, and (4) the labour force participation of women.

Evolution of future coverage. Under the baseline scenario of the valuation, it is assumed that the SSC insured population will increase in the future in line with the growth of the total employed population in the country, thus resulting in a global coverage rate of 70.5 per cent constant over time. Under the optimistic scenario, the present coverage rate of 70.5 per cent will increase to 80 per cent of total employment in 2070 and will remain at this percentage thereafter. Under the pessimistic scenario, the present coverage rate of 70.5 per cent will decrease to 50 per cent of total employment in 2070 and will remain at this percentage thereafter.

Under the first sensitivity test, the GAP would decrease from 44.8 to 43.7 per cent. The reserve would be exhausted only 1 years later. Under the second test, the GAP would increase to 48.1 per cent and the reserve would be exhausted in 2048.

Real wage increase. Under the base scenario, the annual real wage increase is 1.2 per cent in long term. A first sensitivity test assumes a higher real wage increase at 1.5 per cent per year in long term. Under a second test, the real wage increase would be 0.8 per cent per annum. Under the first sensitivity test, the GAP of the OADDI branch would decrease from 44.8 to 40.7 per cent and the reserve would be exhausted three years later. Under the second test, the GAP would increase to 45.0 per cent.

Rate of return. Under the base scenario, the nominal rate of return of the fund is 4.7 percent on average for the period 2024-2113. A first sensitivity test has been performed by assuming a nominal rate of return of 5.7 per cent for the same period. Under that scenario, the GAP of the OADDI branch decreases from 44.8 to 40.6 per cent and the reserve is exhausted 2 years later. Under a second test, the nominal rate of return of the fund is lower at 3.7 per cent on average for the period 2024-2113. Under this second test, the GAP would increase to 49.2 per cent.

Labour force participation of women. Under the base scenario, the global participation rate of women would increase from 15.8 per cent in 2023 to 40 per cent in 2100. Under the sensitivity test, it is assumed that the participation rate of women will be limited to 25 per cent in 2100. This sensitivity test may be associated with a scenario where the fertility rate of women would not decrease in the future (as projected under the base scenario of the valuation) with consequent negative effects on the future participation of women in the labour force. Under the sensitivity test, the GAP would increase from 44.8 to 46.1 per cent.

Combination of scenarios. When combining the different optimistic scenarios above (on coverage, real wage growth and rate of return), the GAP would decrease from 44.8 to 36.4 per cent, but still significantly higher than the average contribution rate of the scheme (18.3 per cent).

Measures to restore the financial sustainability of the OADDI branch

The sensitivity tests concerning the future evolution of the SSC insured population (on the coverage rate and on the participation of women) indicate that all the ongoing efforts to support extension of coverage of the SSC, both by law and de facto, can have positive impact on the financial balance of the OADDI branch, but that in itself extension of coverage will not be sufficient to address the structural imbalances of its design. Important reforms are required to ensure the financial equilibrium in the medium and long term.

The following parametric reforms are presented in the report, with their financial implications:

1. Return to the previous indexation mechanism
2. Neutral early retirement factors
3. Increase of the retirement age
4. Elimination of pension supplements
5. Career-average earnings and reduced accrual rates
   - Option 1: Reduce the pension accrual rate from 2.5 to 2.0 per cent on the first JOD1,500 of earnings such that the accrual rate is uniform (2 per cent) on total earnings
   - Option 2: 1.33 per cent on first JOD400 and 2.0 per cent between JOD400 and JOD1,500 (new ceiling on insured earnings)

With the application of these parametric reforms, the GAP of the OADDI branch would decrease from 44.8 to 30.6 per cent with pension accrual rates under Option 1 and 27.3 per cent with pension accrual rates under Option 2.

To reduce the financial burden of the OADDI branch in the years just following the reform date, a scale-premium approach is recommended. It would result in the following contribution rates:

▶ **Table ES.2. Suggested contribution rates (scaled premium) under Option 1**

Period	On total earnings	
	Private and Civilians	**Military**
2027-2036	20.0%	25.0%
2037-2046	22.5%	27.5%
2047-2056	25.0%	30.0%
2057-2066	27.5%	32.5%
2067-2076	30.0%	35.0%
2077-2086	32.5%	37.5%
2087-2096	35.0%	40.0%

▶ **Table ES.3. Suggested contribution rates (scaled premium) under Option 2**

Period	Private and Civilians		Military	
	On earnings below JOD400	**On earnings between JOD400 and JOD1,500**	**On earnings below JOD400**	**On earnings between JOD400 and JOD1,500**
2027-2036	16.25%	23.75%	21.25%	31.25%
2037-2046	17.50%	25.00%	22.50%	32.50%
2047-2056	18.75%	26.25%	23.75%	33.75%
2057-2066	20.00%	27.50%	25.00%	35.00%
2067-2076	21.25%	28.75%	26.25%	36.25%
2077-2086	22.50%	30.00%	27.50%	37.50%
2087-2096	23.75%	31.25%	28.75%	38.75%

▶ 1. Introduction

In accordance with Article 18(a) of Law No. 1 of 2014, an actuarial review of the social security system of Jordan must be undertaken at periodic intervals. The 10th actuarial review was realised by the ILO as at 31 December 2019. The present actuarial review covers the 4-year period ending 31 December 2023 and presents a projection of the financial situation of the Social Security Corporation over the period from 2024 to 2100. The actuarial review is based on the legal provisions of Law No. 1 of 2014 with subsequent amendments to the law. The report is divided as follows:

- Section 2 is a review of the experience of the SSC since the last actuarial valuation.

- Section 3 presents the projected demographic and macroeconomic environment of Jordan.

- Section 4 presents the demographic and financial projections of the SSC. A base scenario is presented first, followed by sensitivity analyses.

- Section 5 describes a series of measures that would restore the financial sustainability of the pension branch.

- Appendices 1 to 3 include a summary of the provisions of the SSC schemes, the methodology of the actuarial valuation, and detailed actuarial bases used to perform actuarial projections. Appendix 4 presents detailed financial projections by sector (private sector, civil service and military).

▶ 2. Review of the experience of the SSC

This section discusses the evolution of the financial situation of Social Security Corporation (SSC) between 31 December 2019 and 31 December 2023. SSC financial statements, which present detailed information on financial results of the social security scheme, and other data extracted from the SSC database are compared to the projections of the 10th Actuarial Review.

2.1. Legislative modifications since the last actuarial valuation

The following modifications were introduced in the scheme since the last actuarial valuation:

− **Minimum insured earnings**. They evolved as follows:

  ○ In 2020, the minimum wage was JD 220 for Jordanians and JD 190 for Non-Jordanians.
  ○ In 2021, the minimum wage for Jordanians increased to JD 260, and for non-Jordanians, it was JD 230.
  ○ For the years 2022 and 2023, the minimum wage for both Jordanians and non-Jordanians is set at JD 260.

− **Contribution rate for the Military**. Employer's contribution for the Military regarding old age, disability, and death insurance has been combined with work-related injuries insurance to be as follows:

  ○ 17.0 per cent if the real growth rate for a previous year is less than 5 per cent.
  ○ 21.5 per cent if the real growth rate for a previous year equals 5 per cent.
  ○ 26.0 per cent if the real growth rate for a previous year is more than 5 per cent.

− **Contribution adjustments**

  ○ *Youth employment*. Following the latest legislative amendment (2023), private sector establishments now have the opportunity to reduce their contributions for old-age, disability, and death insurance on behalf of young Jordanian workers under the age of 30, who are joining the scheme for the first time. The specific reduction rates and eligible sectors will be established in accordance with a forthcoming bylaw. The reduction rate will be capped at 50% of the employers' share of contributions to old-age, disability, and death insurance.
  ○ *Own account workers*. In 2019 Amendments, own account workers were allowed to join SSC scheme with reduced contribution for Old Age, Death and disability contributions. Specifically, contributions were structured as follows: 1% for Death and Disability insurance and 16.5% for Old Age insurance. For Old Age insurance, own account workers could choose from different contribution levels, referred hereafter as Tranches, at (10%, 25%, 50%, and 75%). While their contribution for Old Age insurance were considered as a one credit for benefit entitlement, it is calculated as a percentage following chosen tranche for benefit calculation. These instructions were in effect from July 1, 2021, until December 31, 2022. However, commencing January 1, 2023, with the implementation of the most recent legislative amendment, these tranches are no longer applicable.

− **Minimum pensions**. From 1 January 2020, minimum pensions were increased for Jordanians and Gazans, as follows:

  ○ JOD160 for total disability pension (natural or work-related), and survivors' pensions (natural or work-related).
  ○ JOD125 for old-age, early retirement and partial disability pensions (natural or work-related). For early retirement, the minimum pension is not applied before age 55 for males and 50 for females.

2.2.   Financial results of the period 2020-2023

This section presents a comparison of projected versus actual results of the SSC for the four-year period between 31 December 2019 and 31 December 2023.

It must first be noted that the SSC presents financial statements for the OADDI, Work injury and Maternity benefits as a single fund, while it would be more appropriate for financing purposes to have separate financial statements for each of the three branches. Specifically, it would be important to follow the evolution of the reserves (accumulated funds) of each benefit branch. For that purpose, it is necessary to allocate investment income and administrative expenditures separately to each branch on a yearly basis.[1] In the absence of distinct financial statements by branch, a separation of reserves at the valuation date is proposed in this report as a starting point for actuarial projections.

Revenues and expenditures of the SSC regarding OADDI, Work injury and Maternity benefits are presented in Tables 2.1. Contributions have exceeded total expenditures by JOD436 million per year on average over the last 4 years (relatively constant). The main component is clearly the OADDI branch which represent 91 percent of total contributions and 95 percent of total benefits.

Administrative expenses represented on average 1.8 percent of contribution income or 2.3 percent of benefit expenditures over the period 2020-2023.

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[1] One approach could be to allocate investment income in proportion of the average assets of each branch during a year, and to allocate investment expenses in proportion of the total of contribution income and benefit expenditure of each branch.

▶ **Table 2.1. Revenues and expenditures of OADDI, Work injury and Maternity branches (2020-2023)**
(JOD millions)

	2020	2021	2022	2023
Contribution revenues				
Regular contributions				
OADDI	1 499.7	1 590.3	1 769.1	1 804.3
Work Injury	133.7	137.0	147.9	157.1
Maternity	33.8	34.8	38.3	40.8
Contributions for purchase of past service	5.5	7.6	7.2	6.8
Voluntary contributions	105.5	120.0	129.5	143.7
Miscellaneous income	37.7	32.4	37.5	80.5
Total contributions	**1 815.8**	**1 922.0**	**2 129.5**	**2 233.2**
Expenditures				
OADDI benefits				
Old-age pensions	385.5	421.5	459.6	508.4
Early retirement pensions	760.1	834.2	904.5	989.1
Natural disability pension	51.1	57.8	62.8	66.4
Natural death pensions	67.3	69.3	71.9	75.5
Funeral grant	0.7	1.3	1.0	0.8
Lump-sum	57.4	63.0	53.9	51.7
Work injury benefits				
Work-related disability pensions	11.0	11.9	12.7	14.3
Work-related death pensions	8.1	9.0	9.9	10.7
Funeral grants	0.1	0.1	0.2	0.1
Other benefits	5.8	13.6	17.4	16.7
Maternity benefits	12.7	14.7	14.8	15.3
Administrative expenses	31.1	36.2	36.4	39.8
Total expenditures	**1 391.0**	**1 532.7**	**1 644.8**	**1 788.9**
Excess of contributions over expenditures	**424.9**	**389.3**	**484.7**	**444.4**

Source: SSC

Revenues and expenditures of the SSC in the Unemployment benefits branch are presented in Table 2.2 for years 2020 to 2023. In 2020, targeted programmes were introduced to support workers during the COVID-19 pandemic which caused an important increase of benefit expenditures and a decrease of the Unemployment fund. These programmes continued to influence the fund in 2021. The Unemployment fund has an accumulated global value of JOD185.9 million at the end of 2023.

▶   **Table 2.2. Revenues and expenditures of the Unemployment branch (2020-2023)** (JOD million)

	2020	2021	2022	2023
Fund at beginning	**241,4**	**208,6**	**164,8**	**145,0**
Revenues				
Contributions	71,2	72,3	76,7	81,5
Share of unemployment insurance fund from the net profit of the Social Security Investment Fund	9,3	8,8	6,2	4,8
Other income	1,4	1,6	4,9	4,1
Investment income	0,0	0,7	0,7	5,6
Total	**82,0**	**83,4**	**88,6**	**96,0**
Expenditures				
Unemployment benefits	74,9	121,8	44,9	39,8
Withdrawal for education and medical treatment	36,5	4,2	61,2	13,2
Retirement and other	0,0	0,0	0,0	0,0
Administrative expenses	3,5	1,1	2,3	2,0
Total	**114,9**	**127,1**	**108,4**	**55,1**
Excess (deficit)	**-32,9**	**-43,8**	**-19,8**	**40,9**
Fund at end	**208,6**	**164,8**	**145,0**	**185,9**

Source: SSC

Table 2.3 compares the consolidated revenues and expenditures of the SSC on OADDI and WI, for years 2020 to 2023, with the projections of the 10th Actuarial Review. Over the four-year period 2020-2023, contribution income has been lower than projections. Benefit expenditures were in line with projections in 2020 and 2021, but higher than projections in 2022 and 2023. Administrative expenditures have been higher than projections over the 4-year period. Investment income was significantly higher than projected in 2021 and 2022. A separate analysis of investment income is presented in Section 2.4.

▶ **Table 2.3. Comparison of projected versus actual results of the OADDI and WI branches regarding the different components of revenues and expenditures** (JOD million)

	2020	2021	2022	2023
Projections of the 10th Actuarial Review				
Contribution income	1 900	2 018	2 126	2 258
Investment income	198	510	643	806
Benefit expenditure	1 361	1 402	1 471	1 551
Administrative expenses	27	28	28	29
Excess	**709**	**1 098**	**1 270**	**1 484**
Observed results				
Contribution income	1 744	1 855	2 054	2 112
Investment income	187	985	1 055	746
Benefit expenditure	1 347	1 482	1 594	1 734
Administrative expenses	31	36	36	40
Excess	**553**	**1 322**	**1 479**	**1 084**

Source: SSC

Table 2.4 presents a comparison of SSC total funds projected at the end of 2020, 2021, 2022 and 2023 according to the 10th Actuarial Review with the corresponding data of the financial statements (actual results). At the end of 2023, SSC accumulated funds are 9 per cent lower than projected.

▶ **Table 2.4. Evolution of funds as at 31 December** (JOD million)

	2020	2021	2022	2023
Projection of the 10th Actuarial Review				
OADDI	12 176	13 132	14 244	15 549
Work injury	466	607	766	945
Maternity	211	248	290	336
Unemployment	209	183	233	288
Total	**13 062**	**14 170**	**15 533**	**17 118**
Actual results (consolidated)	**11 693**	**12 974**	**14 470**	**15 582**
Ratio Actual / Projections	**90%**	**92%**	**93%**	**91%**

Source: 10th Actuarial Review and SSC financial statements

2.3. Experience regarding contributors and beneficiaries

Table 2.5 presents the evolution of the number of contributors over the period 2013-2023. The number of contributors in a year is defined, in this report, as the number of workers who paid at least one contribution during the year.[2]

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[2] This is different from the data provided by the SSC which present the number of SSC contributors who contributed during the last month of the year.

The total number of contributors (males and females combined) increase by 45 per cent over the period 2013-2023 (38 per cent for males and 62 per cent for females). The number of contributors increased by 12 per cent between 2019 and 2023 (11 per cent for males and 14 per cent for females), which is lower than the 20 per cent increase projected for that period in the last actuarial valuation.

Self-employed and voluntary contributors have represented around 10 per cent of the number of private sector participants over the period 2013-2023. Over the last 4 years, hazardous jobs represented on average:

- For males: 13.4 per cent of participants in the private sector, 17.1 per cent in civil service and 1.1 per cent among the military.

- For females: 2.7 per cent of participants in the private sector, 6.6 per cent in civil service and 3.7 per cent among the military.

▶ **Table 2.5. Evolution of the number of SSC contributors, by sector, 2013-2023**

Year	Male				Female			
	Private Sector	Civil Service	Military Personnel	Total	Private Sector	Civil Service	Military Personnel	Total
2013	546 177	175 538	174 118	**895 833**	192 534	114 754	15 031	**322 318**
2014	580 792	176 581	192 532	**949 905**	213 003	117 081	17 022	**347 106**
2015	600 811	179 720	211 349	**991 879**	231 815	120 141	18 477	**370 433**
2016	631 063	182 694	220 785	**1 034 542**	248 690	123 748	19 137	**391 574**
2017	652 154	186 532	233 422	**1 072 108**	269 796	128 283	21 938	**420 017**
2018	659 489	189 567	237 582	**1 086 638**	280 112	134 641	23 281	**438 033**
2019	680 838	196 872	241 334	**1 119 045**	296 025	138 591	23 925	**458 540**
2020	672 586	195 980	241 082	**1 109 648**	282 453	140 144	24 158	**446 755**
2021	709 611	209 759	246 312	**1 165 683**	288 585	145 940	24 995	**459 520**
2022	754 799	201 626	260 272	**1 216 697**	325 339	146 781	26 968	**499 088**
2023	757 325	204 287	277 388	**1 239 000**	342 495	151 010	29 135	**522 640**

Note: Corresponds to the number of persons who paid at least one contribution during the given year.
Source: SSC

Table 2.6 shows the evolution of the average earnings of SSC contributors between the 2019 and 2023 valuations. Over the 4-year period, the salary increase was 10.2 per cent for males and 13.1 per cent for females. More important increases affected participants in the civil service.

▶ **Table 2.6.　Comparison of average earnings, by sector, 2019 and 2023**

Year	Male				Female			
	Private Sector	Civil Service	Military Personnel	Total	Private Sector	Civil Service	Military Personnel	Total
2019	546.85	530.16	483.29	**530.21**	441.18	510.56	433.49	**461.75**
2023	595.67	615.10	529.59	**584.08**	488.97	608.52	468.96	**522.40**

Data obtained from the SSC on the evolution of the number of active insured persons between the beginning and the end of the year shows that there are important movements in and out of the scheme, as shown in Table 2.7. In 2023, for example, 149,319 persons became new contributors, more than 605 097 persons left the scheme and 534,803 persons re-entered (a portion of them likely being the same persons), and 26,812 persons left the scheme (because of retirement, invalidity, death or exit from the labour force), for a net inflow of 52,213 insured persons. Exits and re-entries represent in large part persons who exited and re-entered the scheme during the same year (for example, due to short-term unemployment). According to the definition of active insured persons used in this report (persons having paid at least one contribution during the year), persons with short periods outside the scheme during a year are considered as contributors with continuous participation.

▶ **Table 2.7.　Movements of contributors during the period 2020-2023**

	2020	2021	2022	2023
Number at the beginning of the year	**1 405 551**	**1 327 807**	**1 412 041**	**1 503 019**
New entrants	100 009	173 031	173 968	149 319
Re-entrants	705 777	726 552	542 665	534 803
Exits	(805 937)	(797 817)	(605 517)	(605 097)
Retirements	(24 144)	(14 697)	(17 556)	(24 674)
Disabilities	(1 175)	(895)	(1 116)	(894)
Deaths	(1 959)	(1 929)	(1 466)	(1 244)
Number at the end of year	**1 378 080**	**1 412 041**	**1 503 019**	**1 555 232**

Note: The number of re-entrants and exits include in large part persons who exited and re-entered during the same year (for example, due to short-term unemployment).
Source: SSC

The number of new retirees (new pensioners and beneficiaries of retirement grants) has been significantly higher than projected over the last four years. Figure 2.1 shows the important number of new retirees in 2020 (the first year of the Covid-19 pandemic), followed by a decrease in 2021 and growing numbers thereafter.

▶ **Figure 2.1. Comparison of actual and projected number of people reaching retirement age, 2020–2023**
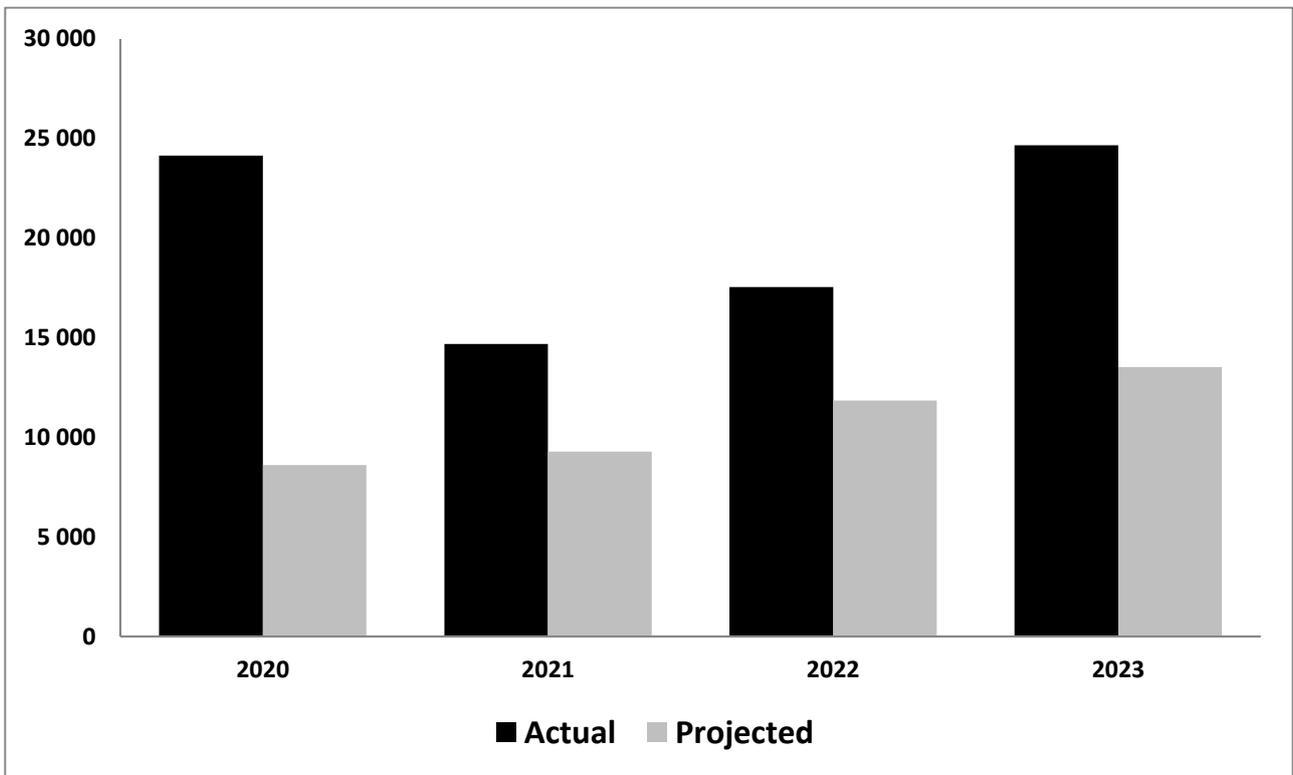
Table 2.8 reveals that the number of old-age pensioners is 208,899 at the end of 2023 compared to a projection of 170,925 in the last actuarial review, due to a higher-than-expected number of new retirees over the last four years. Regarding invalidity pensions from natural causes, the number of pensioners at the end of 2023 is slightly lower than the projection of 13,727 in the last valuation. The number of widows' pensions resulting from natural death in payment at the end of 2023 is 8 per cent higher than projected, while the number of orphans' pensions is 20 per cent higher than projected.

For work injury benefits, the number of new disability pensions was slightly higher than projected. The number of work-related survivors' pensions has generally been higher than projected over the last four years, as for the number of orphans.

Average old-age pensions at the end of 2023 are 3 per cent higher than those projected in the 10th Actuarial Review. For invalidity pensions (natural cause), the average monthly pensions are close to the projections. Survivors' average pensions in payment at the end of 2023 are also close to what has been projected in the last actuarial review. Concerning work injury pensions, pension amounts are close to projections, except for widows(ers) amounts which have been very stable over the last four year, contrary to a steady projected increase in the last actuarial review.

▶ **Table 2.8. Comparison of projected versus observed number of pensioners and average pensions (2020-2023)**

	Projections of the 10ᵗʰ Actuarial review				Observed results			
	2020	2021	2022	2023	2020	2021	2022	2023
OADDI								
Old-age (early and normal retirement)								
Pensions in payment (year-end)	159 416	161 431	165 453	170 925	169 382	179 356	193 386	208 899
Average monthly pension (JOD)	539	543	549	555	552	560	566	572
Invalidity								
Pensions in payment (year-end)	11 750	12 247	12 907	13 727	11 556	11 683	11 983	12 140
Average monthly pension (JOD)	316	324	334	345	321	321	323	324
Widows(ers)								
Pensions in payment (year-end)	57 154	60 488	63 944	67 532	60 347	64 804	69 233	72 902
Average monthly pension (JOD)	157	160	165	171	162	170	173	175
Orphans and other dependents								
Pensions in payment (year-end)	164 085	167 744	171 504	175 148	177 012	190 736	201 455	210 127
Average monthly pension (JOD)	50	52	56	60	50	53	54	55
WORK INJURY								
Disability								
Pensions in payment (year-end)	3 802	4 067	4 345	4 636	4 371	4 582	4 799	4 867
Average monthly pension (JOD)	225	225	225	226	217	220	222	222
Widows(ers)								
Pensions in payment (year-end)	2 740	2 800	2 865	2 935	2 943	3 017	3 197	3 296
Average monthly pension (JOD)	145	152	161	171	138	144	146	147
Orphans and other dependents								
Pensions in payment (year-end)	13 250	13 004	12 789	12 586	14 684	15 021	15 801	16 230
Average monthly pension (JOD)	47	50	53	56	44	47	49	50

The number of lump-sums paid by the SSC was very high during 2020 and 2021, as shown in Table 2.9. According to Defence Order No. 14, it was possible to receive an advanced lump sum compensation during Covid-19 equal to 5 per cent of wage subject to social security, maximum JOD200.

The number of lump sums paid to non-Jordanians leaving the country was higher during 2020 and 2021, as compared with the following two years.

▶ **Table 2.9. Lump sums paid during the period 2020-2023**

Reason for termination of coverage	2020		2021		2022		2023	
	Number	Amount (million JOD)	Number	Amount (million JOD)	Number	Amount (million JOD)	Number	Amount (million JOD)
Non-Jordanians leaving the country	24 417	28.5	35 668	33.8	18 196	23.4	17 814	22.9
Women devoted to family affairs	12 118	9.2	9 308	9.6	10 785	12.3	11 499	12.6

End of service without pension entitlement	5 510	11.4	5 822	12.6	6 047	12.4	5 625	11.7
Advanced lump sum during Covid	539 782	120.4	416 015	103.6	1 888	0.6	-	-
Other	8 180	11.7	5 210	8.1	3 207	5.6	2 882	5.6
Total	**590 007**	**181.2**	**472 023**	**167.7**	**40 123**	**54.2**	**37 820**	**52.8**

2.4.   Investments

2.4.1.   Asset allocation

Total SSIF assets were JOD14,838 million on 31 December 2023. The invested assets were distributed as appearing in Table 2.10 at the end of 2023. A proportion of 57 percent of the portfolio was invested in bonds and 16 per cent in equity. Around 75 per cent of the portfolio is invested in fixed-income securities (bonds, money market and loans). The table also compares the current asset allocation with the target allocation of the SSIF investment policy, showing that the weight of money market is presently higher than the target, and the weight of equity is lower than the target.

▶ **Table 2.10. Distribution of SSIF's investment portfolio as of 31 December 2023**

Asset category	Current asset allocation	Target asset allocation of the investment policy	Target range
Money Market	13.6%	2.5%	2% - 15%
Bonds	56.9%	55.0%	50% - 60%
Loans	3.7%	5.0%	2% - 8%
Equity	15.7%	27.5%	17% - 35%
Real Estate	5.7%	7.5%	5% - 10%
Tourism	2.1%	2.5%	2% - 4%
Other	2.2%	–	–
Total	**100.0%**	**100.0%**	

Source: Social Security Investment Fund, Annual Report 2023.

2.4.2.   Rate of return of the fund

The rates of return of the SSIF are presented in Table 2.11 for the years 2020 to 2023. The observed average rate of return of the fund during that 4-year period was 5.8 per cent, compared to an average return of 3.8 per cent assumed in the 10th actuarial review for the same period.

▶ **Table 2.11. Rate of return of the fund (2020-2023)**

Year	Projected rate of return (10th Actuarial Review)	Observed rate of return
2020	1.6%	1.6%
2021	3.9%	8.3%
2022	4.6%	8.0%
2023	5.2%	5.1%
Average (2020-2023)	**3.8%**	**5.8%**

Source: Social Security Investment Fund and 10th Actuarial Review.

The scheme administered by the SSC is a collective instrument and the Social Security Investment Fund (SSIF) has a long-term investment horizon compatible with the long-term nature of benefits offered by the SSC. The SSIF could accept a certain volatility of returns and may even accept negative returns for certain periods, without compromising the promises made to SSC insured persons.

▶ 3. Projected demographic and macroeconomic environment of Jordan

Future income and expenditure of the SSC are linked to changes in the size and age structure of the population of the country, employment levels, economic and wage growth, inflation, and rates of return on investments. Therefore, for estimating future SSC finances, a projection of Jordan's total population and economic activity is required. Demographic projections provide estimates of the size and composition of the labour force, while projections of the gross domestic product (GDP) and the growth of labour productivity are necessary to project the number of workers and their earnings.

Demographic and macroeconomic variables were projected following an analysis of past trends and an estimate of plausible future experience. Population and economic projections are an intermediary step to derive SSC projections.

3.1.   Population projection

The determinants of future population changes are fertility, mortality, and net migration. Fertility rates determine the number of births, while mortality rates determine how many, and at what ages people are expected to die. Net migration represents the difference between the number of people who permanently enter and leave Jordan and is the most volatile of the three factors.

The last official population census took place in 2015 where the total resident population of Jordan (including refugees) was estimated at 9,531,712 persons.

3.1.1. Starting population

As a starting point for the projection, it is first necessary to establish the initial population, by age and by sex, as of the middle of 2023. This data is taken from the United Nations World Population Prospects (UNWPP).[3] It is consistent with data published by the Jordan's Department of Statistics (DOS). Table 3.1 presents a summary of the population of Jordan, by age group and gender, as of the middle of 2023.

▶ **Table 3.1. Population of Jordan, middle of 2023**

Age group	Male	Female	Total
0–14	1 821 064	1 750 465	3 571 529
15–29	1 579 731	1 503 920	3 083 650
30–44	1 279 810	1 114 542	2 394 352
45–59	821 274	721 986	1 543 260
60 & over	367 105	377 158	744 262
Total	**5 868 983**	**5 468 070**	**11 337 053**

3.1.2. Fertility

The total fertility rate (TFR) represents the average number of children each woman of childbearing age would have if she had all her children in a particular year. If there is no migration, a TFR of 2.1 is required for each generation to replace itself.

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[3] United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects 2022*.

Age-specific fertility rates are projected according to the UN projection (medium variant). The TFR starts at 2.74 in 2023 and gradually decreases to reach the ultimate assumption of 1.76 in 2096. It stays constant thereafter.

It is also assumed that the ratio of male to female births will stay constant around 1.05, which is the ratio use in the United Nations population projection.

3.1.3. Mortality

Starting life expectancies at birth for males and females are taken from United Nations World Population Prospects. Life expectancy at birth in 2023 is estimated at 72.9 years for males and 77.5 years for females. Life expectancy at advanced ages is a key driver of the cost of retirement pensions. At age 60, life expectancy is estimated at 17.5 years for males and 21.1 years for females in 2023.

Mortality improvements are assumed to occur in accordance with UN estimates (at medium pace) according to their projected life tables at exact age. Under this pattern of mortality improvement, it is projected that in 2070 life expectancy at birth will reach 82.7 years for males and 85.3 years for females, while life expectancy at age 60 will be 24.6 years for males and 27.0 years for females. Table 3.2 presents life expectancies at different points in time until 2100.

3.1.4. Migration

Precise data on migration are not available in Jordan. Net migration has been assumed to occur in line with the UN projection (medium variant) but considering a return to their home country of 50 per cent of Syrian refugees over the period 2029-2043 (no return over the first 5 projection years). This is different from UNWPP which assumes a return of all Syrian refugees in the future. [4]

Table 3.2 summarizes the evolution from 2024 to 2100 of key demographic assumptions.

▶ **Table 3.2.   Key demographic assumptions, 2024–2100**

Year	Total fertility rate	Life expectancy at birth		Net migration (annual)
		Male	**Female**	
2024	2.70	74.7	79.3	-4 000
2030	2.50	75.6	80.1	-26 022
2040	2.24	77.3	81.5	-26 022
2050	2.04	79.1	82.9	-4 000
2060	1.93	81.0	84.1	-4 000
2070	1.87	82.7	85.3	-4 000
2080	1.82	84.1	86.5	-4 000
2090	1.78	85.4	87.7	-4 000
2100	1.76	86.5	88.9	-4 000

3.1.5. Projected population

Figure 3.1 presents the projected population of Jordan from 2025 to 2100 separated into three age categories: children (0-15), persons who can potentially contribute to the SSC (16-59) and persons aged 60 and over. The

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[4] The UNHCR survey published in May 2023 (*Eight Regional Survey on Syrian refugees' perceptions & intentions on return to Syria*) reveals that the intention to return to Syria was relatively low over the next 5 years, and around half of Syrians expect to return to Syria at some point in the future.

evolution of the relative size of each age-group (notably the decrease of the population of children and the increase of the number of persons at pensionable age) illustrates the slow projected ageing of the population of Jordan.

▶ **Figure 3.1. Projected population of Jordan, by age groups, 2025–2100**
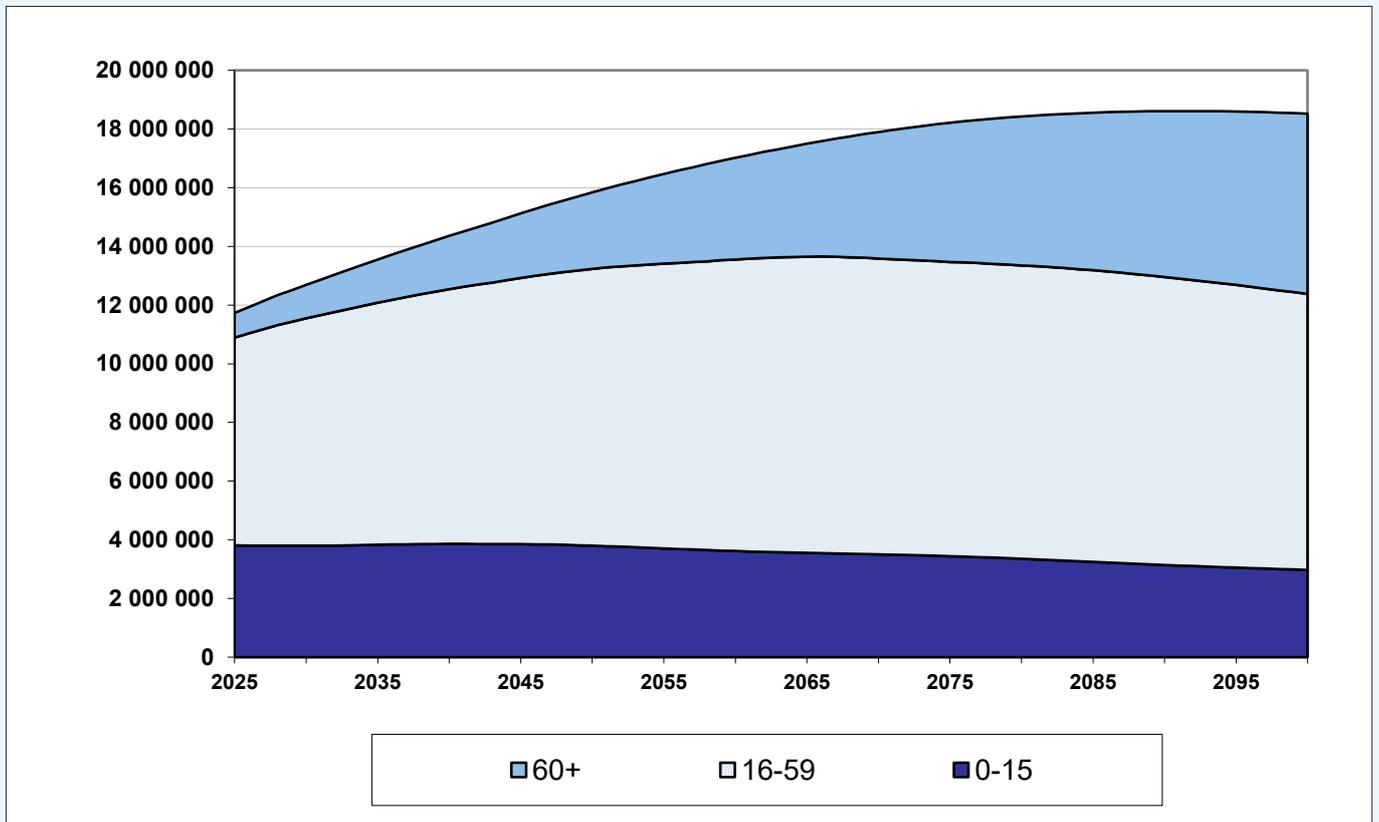
Table 3.3 presents detailed population projections. The total population of Jordan is projected to increase by 55 per cent between 2024 and 2070, from 11,530,973 in 2024 to 17,895,531 in 2070, and stabilize thereafter. The number of persons at pensionable age (60 and over) will grow from 788,215 in 2024 to 4,310,938 in 2070 and 6,139,363 in 2100. The ratio of the number of working-age persons (16-59) to the number of persons aged 60 and over will fall from 8.8 to 1.5 over the next 75 years.

▶ **Table 3.3.   Projected population of Jordan, 2024-2100**

Year	Age group				Ratio 16–59 / 60 & over
	0–15	**16–59**	**60 & over**	**Total**	
2024	3 809 337	6 933 421	788 215	11 530 973	8.8
2030	3 796 546	7 751 470	1 135 960	12 683 976	6.8
2040	3 860 449	8 679 762	1 818 310	14 358 520	4.8
2050	3 801 614	9 430 566	2 606 579	15 838 759	3.6
2060	3 616 262	9 936 831	3 462 360	17 015 454	2.9
2070	3 506 107	10 078 487	4 310 938	17 895 531	2.3
2080	3 356 614	9 995 330	5 073 009	18 424 953	2.0
2090	3 144 275	9 810 929	5 650 094	18 605 298	1.7
2100	2 972 512	9 405 106	6 139 363	18 516 982	1.5

3.2.   Labour force projection

According to the IMF, "*Job creation has not kept pace with population growth and skill mismatches persist. The private sector in Jordan continues to grapple with a range of obstacles, including high energy costs, unpredictable and extensive regulatory processes, limited access to finance, and labor market rigidities. The distribution of firm sizes in Jordan is heavily skewed towards micro and small enterprises, while the number of medium-sized enterprises is relatively low. Small businesses appear to face considerable obstacles to expand.*"[5] Labour force participation rates of females are very low and unemployment rates are high.

It is assumed that the total labour force participation rate will increase during the projection period.

－   For males, age-specific participation rates are projected to increase to reach a total participation rate of 70 per cent (age 15 to 69) in 2053. Age-specific participation rates are kept constant thereafter. The total participation rate of males decreases slightly thereafter, driven by the evolution of the age structure of the labour force (see Figure 3.2).

－   For females, it is assumed that the total participation rate will increase from its current level of 16 per cent to reach a total participation rate of 30 per cent in 2053 and 40 per cent (age 15 to 69) in 2100. It is reasonable to expect that Jordan will experience, in the next decades, the same trend observed in most countries regarding the increase of the participation rate of women.

It is further assumed that the global unemployment rate (males and females combined) will decrease from its current level of 16.6 per cent to 10 per cent in 2073 and stay constant thereafter. The current unemployment rates of 15.1 per cent for males and 23.1 per cent for females observed in 2023 will respectively decrease to 7.8 per cent for males and 14.2 per cent for females in 2080 (see Table 3.4).

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[5] IMF, Country Report No. 24/10.

▶ **Figure 3.2. Projected total participation rate (15-69), by gender, 2025–2100**
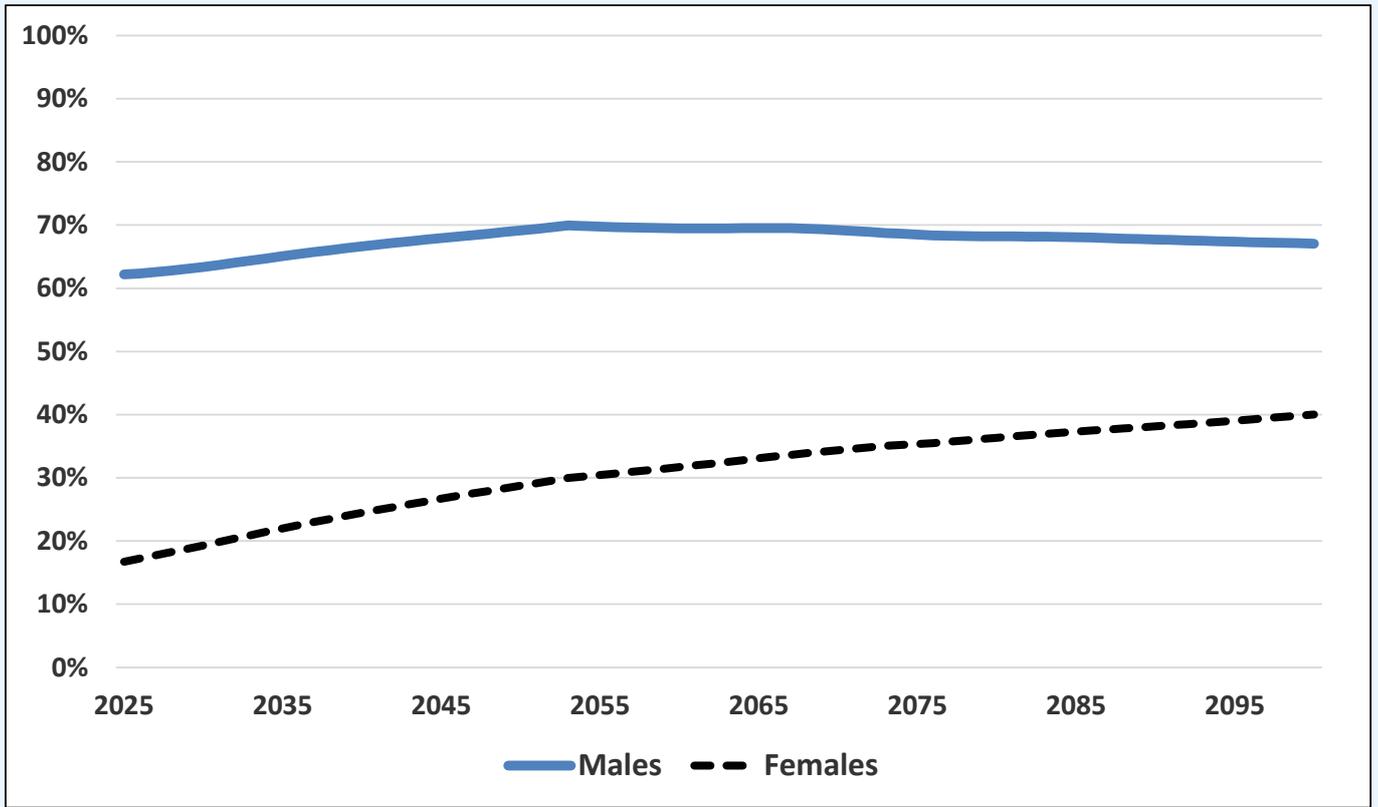
▶ **Table 3.4. Labour market balance, 2023-2100** (in thousand)

	2023	2040	2060	2080	2100
Total population	11 337	14 358	17 015	18 425	18 517
Male	5 869	7 355	8 631	9 299	9 336
Female	5 468	7 003	8 384	9 126	9 181
Population 15-69	7 509	9 967	11 873	12 328	11 864
Male	3 930	5 140	6 053	6 286	6 060
Female	3 579	4 827	5 820	6 042	5 804
Labour force 15-69	2 999	4 606	6 051	6 485	6 388
Male	2 433	3 425	4 206	4 289	4 065
Female	566	1 181	1 845	2 196	2 323
Participation rate	39.9%	46.2%	51.0%	52.6%	53.8%
Male	61.9%	66.6%	69.5%	68.2%	67.1%
Female	15.8%	24.5%	31.7%	36.3%	40.0%
Total employed	2 500	3 951	5 347	5 839	5 751
Male	2 065	3 003	3 802	3 954	3 754
Female	435	948	1545	1885	1 997
Unemployed	498	655	704	647	637
Male	367	422	404	335	311
Female	131	233	300	312	326
Unemployment rate	16.6%	14.2%	11.6%	10.0%	10.0%
Male	15.1%	12.3%	9.6%	7.8%	7.7%
Female	23.1%	19.8%	16.3%	14.2%	14.0%

3.3. Macroeconomic framework

3.3.1. Productivity of labour

Labour productivity, defined as the GDP per employed person, is low in Jordan, partially driven by the low level of education and skills of the workforce. In addition, it is considered that the Jordanian labour market faces certain rigidities that prevent, at least in the short term, a significant increase of the productivity of labour. Data indicate that labour productivity growth was negative most of the time since 2013. Based on IMF forecasts (2024 to 2029)[6] and the labour force framework described above, it is assumed that the growth of productivity of labour will be slightly negative between 2024 and 2028 but will improve thereafter to reach 1.0 per cent in 2073 and 1.2 per cent in 2085 and will remain at that level thereafter (see Table 3.5).

3.3.2. Economic growth

According to the IMF, *"Jordan has weathered a series of shocks relatively well, owing to adept policy making and sizable international support. Despite a challenging global and regional environment, Jordan has maintained macro stability, its economy is growing, albeit at a moderate pace, and inflation is low. However, despite progress achieved,*

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[6] IMF, *World Economic Outlook*, April 2024.

unemployment is still very high, public debt is elevated and above pre-pandemic levels, and structural challenges weigh on private sector development." [7]

As seen in Figure 3.3, following a period of positive growth before 2020, there is a significant decrease in 2020 during the Covid-19 pandemic. Real GDP is projected to increase by 3 per cent from 2025 to 2029 according to IMF World Economic Outlook for Jordan. Thereafter, the projected real GDP growth rate results from the combination of assumptions on the future evolution of productivity growth and employment growth. It is expected that real GDP growth will gradually decrease to 1.2 percent in 2080 and 1.0 per cent in 2100, pushed downwards by the slower employment growth (see Table 3.5).

▶ **Figure 3.3. Real GDP growth of Jordan, actual and projected, 2018–2029**
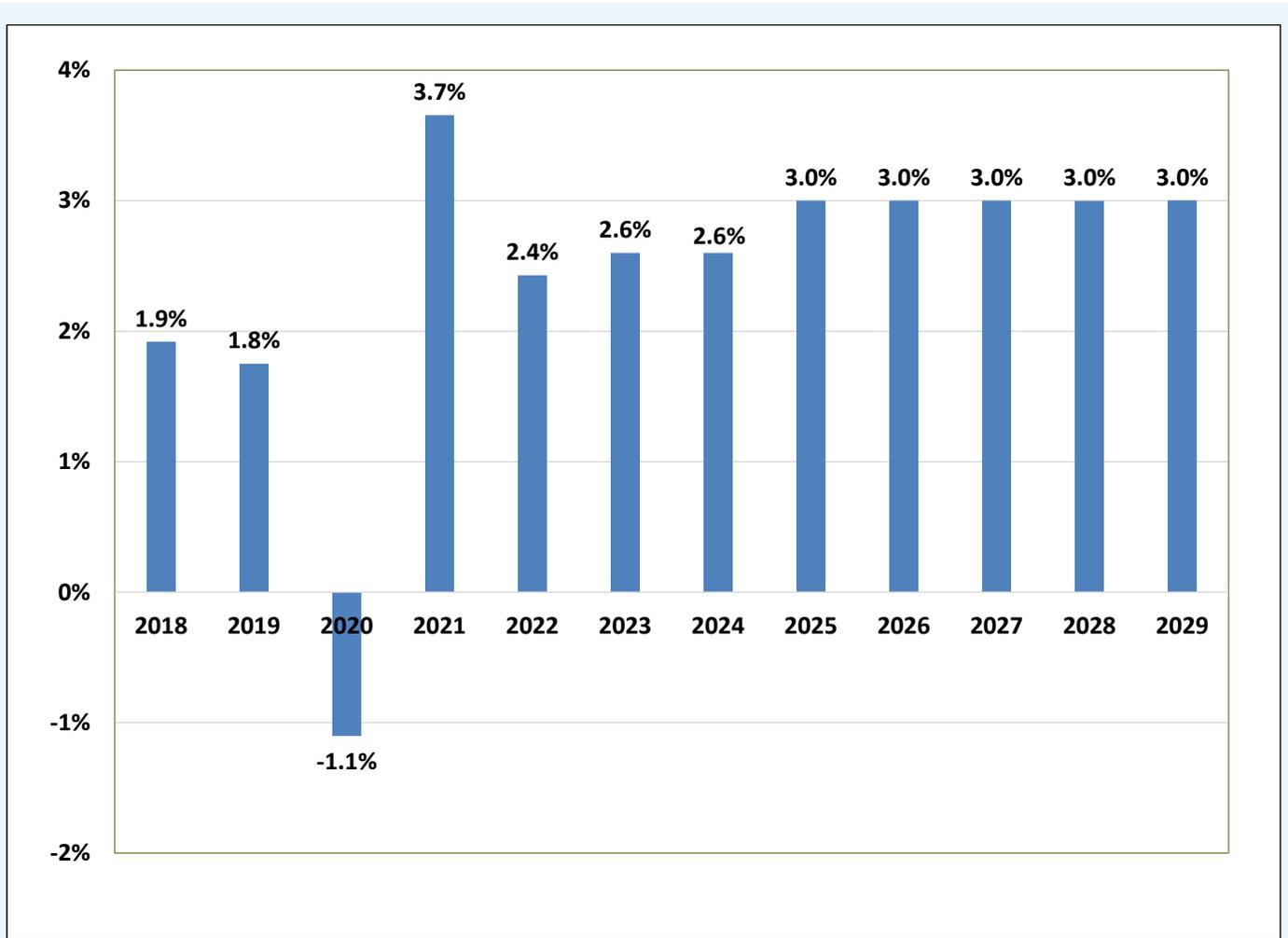
Source: Department of Statistics, Jordan for years 2018 to 2023, International Monetary Fund for years 2024 to 2029.

[7] IMF, Country Report No. 24/10.

▶ **Table 3.5. Projected GDP growth, productivity, and employment growth, 2024-2100**

Year	Real GDP growth (%)	Increase of the productivity of labour (%)	Increase of the number of workers (%)
2024	2.6	-0.7	3.3
2025	3.0	-0.3	3.3
2026	3.0	-0.2	3.2
2027	3.0	-0.2	3.2
2028	3.0	-0.1	3.1
2029	3.0	0.1	2.9
2030	3.0	0.1	2.8
2040	2.4	0.3	2.1
2050	2.3	0.5	1.7
2060	1.6	0.7	0.8
2070	1.4	0.9	0.5
2080	1.2	1.1	0.1
2090	1.1	1.2	-0.1
2100	1.0	1.2	-0.2

3.3.3. Inflation

After being very low from 2019 to 2021, inflation increased in 2022. It is expected to stabilize around 2.5 per cent until 2029 according to the IMF (see Figure 3.4). After 2029, it is assumed that inflation will be stable at 2.5 percent.

The level of the assumed projected inflation rate has not much influence on the results of the valuation because it affects both the revenue and the expenditure of the scheme. The results of the valuation are more influenced by the projected real wage increase.

▶ **Figure 3.4. Inflation rate in Jordan, observed and projected, 2017–2029**
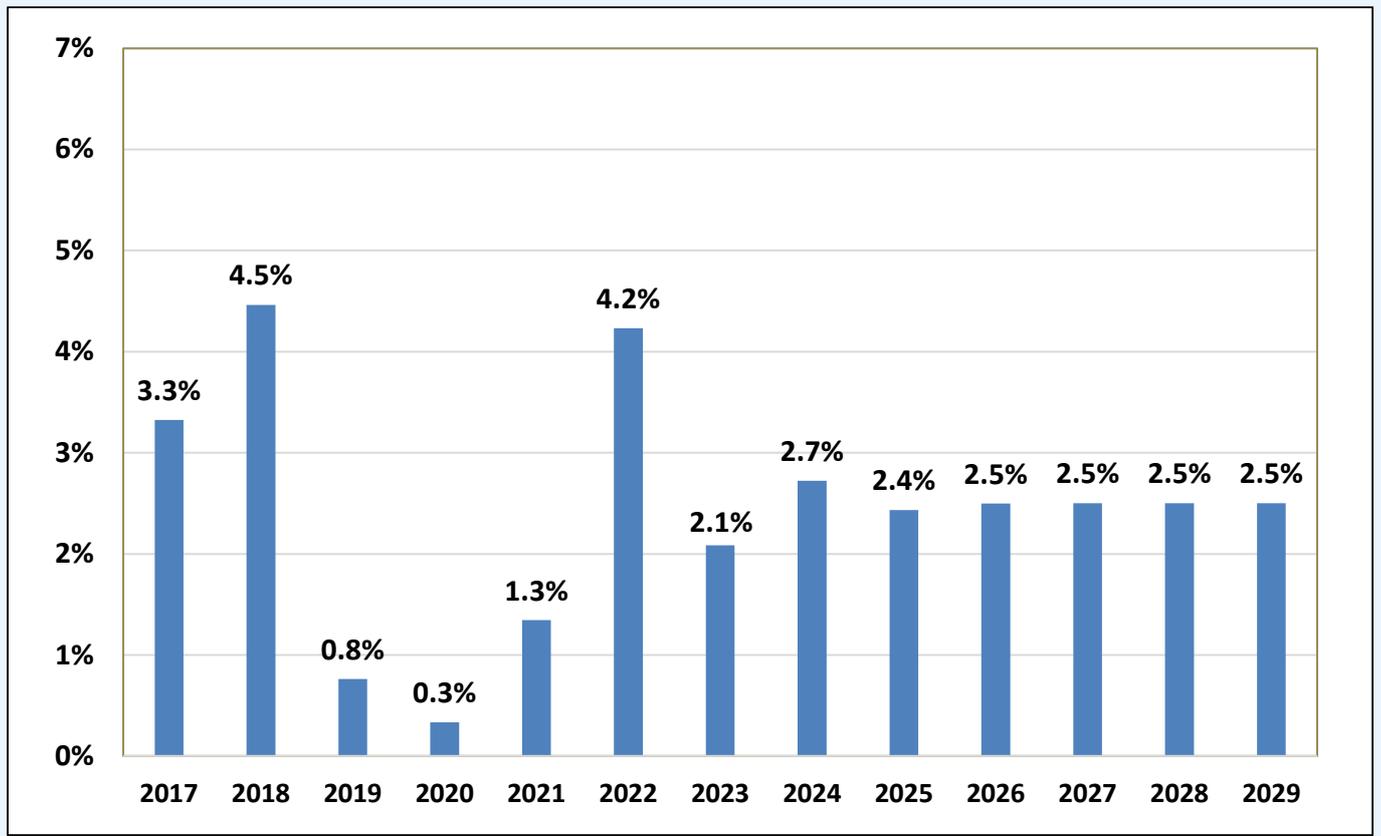
Source: Department of Statistics, Jordan for years 2017 to 2023, International Monetary Fund for years 2024 to 2029.

3.3.4. Wage increases

In the future, the real wage increase is assumed to gradually converge towards the productivity per worker, as it is expected that wages will adjust to efficiency levels over time. Nominal wage increases are assumed to be equal to inflation for the period 2024 to 2028 (period during which productivity growth is projected to be negative). Thereafter, nominal wage increases are assumed to account for inflation and productivity growth. The gradual increase of productivity growth over the projection period is driving future wage increases (see Table 3.6).

▶ **Table 3.6. Projected inflation rate and wage increase, 2024-2100**

Year	Inflation rate (%)	Annual nominal increase of average wage (%)
2024	2.7	2.7
2025	2.4	2.4
2026	2.5	2.5
2027	2.5	2.5
2028	2.5	2.5
2029	2.5	2.6
2030	2.5	2.6
2040	2.5	2.8
2050	2.5	3.0
2060	2.5	3.2
2070	2.5	3.4
2080	2.5	3.6
2090	2.5	3.7
2100	2.5	3.7

3.3.5.   Rate of return of the fund

The projected rate of return of the SSIF is determined with reference to the SSIF Investment Policy. A target rate of return of the fund is calculated as the weighted average of assumed projected rates of return determined for each asset class, as shown in Table 3.7. For fixed income securities (money market, bonds, and loans), projected rates of return are established with reference to projected inflation rates plus a risk premium associated with each particular security type; for variable income securities (equity, real estate, and tourism), the link is made with the projected nominal GDP growth according to the macroeconomic framework of the valuation. Combining the target asset allocation with the nominal returns of each asset class leads to projected global rates of return as appearing in Table 3.8.

This method allows to account for the present level of interest rates and short-term expectations (while limiting the global return to the inflation rate plus 3 per cent). At the same time, it guarantees a long-term rate of return at least equal to the general wage growth plus 0.5 per cent (ensuring long-term returns aligned with economic growth).

▶ **Table 3.7. Method for projecting rates of return by asset class**

Asset class	Target asset allocation	Method for the projection of nominal rates of return
Money Market	2.5%	Inflation rate + 1%
Bonds	55.0%	Inflation rate + 2%
Loans	5.0%	Inflation rate + 3%
Equity	27.5%	Nominal GDP growth + 1%
Real Estate	7.5%	Nominal GDP growth
Tourism	2.5%	Nominal GDP growth

The macroeconomic framework described in this section projects a GDP growth that is decreasing in the long term. It is considered that a slower rate of economic growth would drive downward the rate of return of the fund in the long term.

▶ **Table 3.8. Projected rate of return of the SSIF, 2024-2100**

Year	Nominal rate of return
2024	5.1%
2025	5.2%
2026	5.2%
2027	5.2%
2028	5.2%
2029	5.2%
2030	5.2%
2040	5.0%
2050	4.9%
2060	4.6%
2070	4.6%
2080	4.5%
2090	4.5%
2100	4.4%

Note: The average projected rate of return over the period 2024-2113 (period of calculation of the GAP) is 4.7%.

▶ 4. SSC demographic and financial projections

This valuation deals with the ability of the SSC to meet its future obligations at the time they fall due. This is done under an open-group approach. It is assumed that workers will continue to be insured by the SSC indefinitely, thus paying contributions, accruing benefit entitlements and later receiving benefits in accordance with the legal provisions of the system. Future contributions and benefits are calculated according to the demographic and economic framework presented in Section 3 and on the basis of the database and assumptions shown in Appendix 3.

The main purpose of the valuation is to find out whether the financing of the SSC is on course, and not to forecast numerically exact values. Due to the long-term nature of the assumptions, absolute figures contain a high degree of uncertainty. Therefore, results should be interpreted carefully. Sensitivity tests presented in this section show a possible range of results depending on the chosen assumptions. Future actuarial reviews undertaken on a regular basis will make possible a validation of the assumptions in the light the actual experience.

This review deals with the expenditure and revenue of the following branches administered by the SSC: Old-age, disability and death insurance (OADDI), Work injury (WI) benefits, Maternity benefits and Unemployment benefits. It has already been recognized by the SSC that the nature of Unemployment benefits (individual accounts) requires a separation of reserves from the other branches of the SSC in order to avoid any cross-subsidization between the Unemployment branch and the other branches administered by the SSC. Such a separation should also be done for the other benefit branches.

The key area of concern will be Old-age, disability and death insurance since it accounts for the largest proportion of future expenditure. It is certain that this proportion will grow significantly in the future due to its current immature status. Old-age, disability and death insurance will become mature only after the youngest of the first generation of contributors have become pensioners, then died and all survivors' pensions paid on their behalf have ceased. This requires that the situation of the system be analysed over a long period (in the present review, projections are presented until 2100). The general methodology of the actuarial review is presented in Appendix 2.

4.1. Bases used for future adjustment of certain parameters

Financial projections under the base scenario require a certain number of assumptions regarding the future adjustment of certain scheme's parameters. For this valuation, it is assumed that the JOD1,500 threshold separating the two wage bands for the application of pension accrual rates will stay constant indefinitely. The following amounts are assumed to remain unchanged in the future: the fixed supplements of JOD20 before normal retirement age and JOD40 from normal retirement age, the minimum and maximum dependent's supplement, and the minimum of JOD30 and maximum of JOD50 applicable to the 10 per cent pension increase granted to the OLD category. Projections also assume that the minimum pension is indexed annually in line with the general wage increase and that the funeral grant is indexed annually in line with the inflation rate.

The choice to freeze certain thresholds and parameters for projection purposes is linked to past practice and it appears to exist an intention to limit the cost of the scheme by not indexing the flat-rate supplements. This results in a reduction over time, in real terms, of these supplements. There also appears to exist a strong intention to freeze the threshold separating the two wage bands so that, in the longer term, pensions will be mainly determined with reference to the lower accrual rates associated with the salary band above JOD1,500.

4.2. Old-age, disability and death insurance

4.2.1. Demographic projections

Table 4.1 presents the demographic projections of the OADDI branch for the period 2024 to 2100. According to assumptions concerning the future evolution of the SSC covered population (see Section A3.1 of Appendix 3), the number of contributors to the scheme will increase by a factor of 2.2 over the period 2024-2100, while the total number of beneficiaries will increase by a factor of 12.5. Consequently, the ratio of contributors to beneficiaries will decrease from 4.5 in 2024 to 1.6 in 2060 and 0.8 in 2100. This is one of the main factors leading to a substantial increase of the cost of the scheme over future decades.

Figure 1.1 shows the future evolution of the number of SSC contributors by sector of activity.

▶ **Figure 4.1. Projected number of SSC contributors, by sector of activity, 2024-2100**
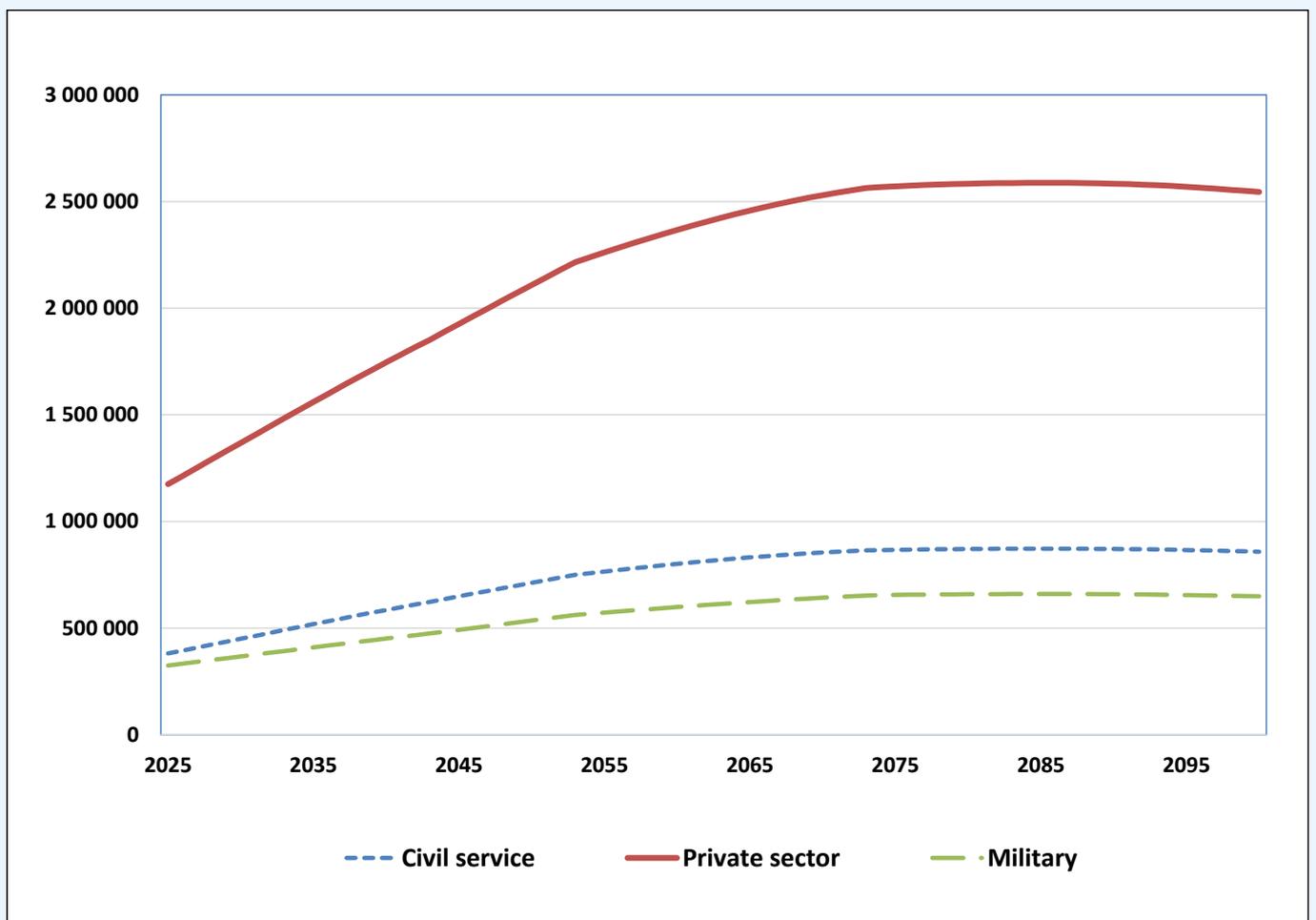
▶ **Table 4.1. Projected number of contributors and pensioners of the OADDI branch, 2024–2100**

Year	Number of contributors[1]	Number of beneficiaries							Ratio of contributors to pensioners
		Old-age	Disability (non-work)	Widows	Other survivors	Lump sums	Funeral grants	Total	
2024	1 820 281	217 437	11 726	62 980	102 972	5 257	3 066	403 437	4.5
2025	1 880 360	227 318	12 064	67 461	110 975	4 799	2 797	425 412	4.4
2026	1 941 378	239 769	12 474	71 512	116 862	4 955	2 907	448 479	4.3
2027	2 003 348	254 989	12 945	75 618	121 107	5 520	3 016	473 196	4.2
2028	2 066 149	274 178	13 485	79 799	124 821	5 518	3 114	500 914	4.1
2029	2 126 118	296 374	14 089	84 057	128 121	5 840	3 196	531 678	4.0
2030	2 186 487	320 958	14 742	88 427	131 057	6 026	3 278	564 488	3.9
2040	2 783 092	641 711	23 085	140 525	178 743	5 580	3 782	993 425	2.8
2050	3 356 857	1 060 631	34 689	214 745	245 843	2 055	4 142	1 562 105	2.1
2060	3 767 228	1 626 949	48 338	313 560	320 471	1 841	4 190	2 315 347	1.6
2070	4 027 639	2 248 063	61 530	435 567	408 392	2 057	3 771	3 159 380	1.3
2080	4 113 899	2 771 829	73 277	572 161	503 799	2 092	3 373	3 926 530	1.0
2090	4 114 245	3 223 001	82 545	683 402	582 531	2 073	2 932	4 576 486	0.9
2100	4 051 668	3 573 605	89 037	751 969	639 465	2 034	2 484	5 058 594	0.8

[1] Number of insured persons who paid at least one contribution during the year.

The large number of projected survivors' pensions raises the issue of the extended definition of survivors applicable under the scheme. Eligible survivors include, in addition to widows, disabled widowers and insured's male children up to age 23, all dependent daughters if unmarried, widowed, or divorced, dependent brothers younger than age 18, dependent sisters, parents and unborn child.

The number of projected disability pensions is low. It appears that the low effective retirement age prevents most insured persons from becoming disabled above age 45 where the incidence of invalidity is normally higher. It might also be linked to a strict administration of this benefit by the SSC.

The number of projected lump sum benefits appearing in Table 4.1 is lower than the number observed currently because the actuarial model used for this valuation considers as lump sum recipients only those who reach the normal retirement age without being eligible for a pension. The other lump sums resulting from cases of insured persons who leave the country and receive an amount related to the contributions they paid to the scheme do not appear here, considering that benefits received by these persons are cancelled to some extent by the contributions they have paid previously to the scheme. Recent lump sums paid during the Covid-19 pandemic are also not considered here since they are non-recurrent.

Under the scheme, funeral grants are paid only in case of death of an active insured person. This explains the low number of projected funeral grants.

4.2.2.   Replacement ratio

Apart from being driven by the evolution of the number of beneficiaries, the cost of SSC benefits will also be affected by the average amount of benefits paid to these persons. One indicator of the evolution of pension amounts is the pensions' replacement ratio (the ratio of average pension to the average wage of active contributors). Table 4.2 presents replacement ratios in selected years for each type of pension. Replacement

ratios for old-age start above 100 percent and decrease continuously over the projection period. The high projected replacement ratios of the old-age pension in the early projection years reveal that the pension formula is generous (in relative terms), the result of the high pension accrual rates and a series of supplements that are added to the basic pension. High initial replacement ratios also result from the use of a reference salary for pension calculation based on a small number of years just preceding retirement.

Old-age replacement ratios decrease over time because persons of the OLD category with generous early retirement conditions are gradually replaced by persons of the CURRENT and NEW categories who have less generous early reduction conditions. The decrease of replacement ratios after 2050 is mainly due to a gradual shrinkage of the value (in relative terms) of the 1,500 JD threshold on which the higher 2.5 percent pension accrual rate is applied, given that the average wage of contributors will gradually exceed that threshold over time. Other factors explain the decrease of replacement ratios in the long term: the assumed increase of the labour force participation rates of women in the future, and the assumption that pension supplements are not indexed.

▶ **Table 4.2.   Projected replacement ratios – OADDI branch, 2024–2100**

Year	Old-age	Invalidity	Widows / widowers	Other survivors
2024	104%	62%	39%	16%
2030	102%	66%	40%	19%
2040	91%	62%	40%	20%
2050	80%	58%	39%	21%
2060	77%	55%	37%	23%
2070	76%	52%	35%	25%
2080	72%	47%	32%	25%
2090	69%	43%	31%	24%
2100	66%	40%	30%	23%

4.2.3.   Financial projections

Table 4.3 presents financial projections for the OADDI branch. The initial OADDI reserve established on 31 December 2023 is the residual SSC reserve after considering the amounts attributed to the other benefit branches (detailed calculation are shown in Section 4.8.1).

In 2024, OADDI funds represent 8.8 times the annual expenditure of the branch. The pay-as-you-go cost rate (the ratio of total expenditure to total insurable earnings in a given year) is 16.0 percent in 2024, but this ratio will increase significantly after 2030, at the time the scheme will experience a sharp increase in the number of pensioners. The PAYG cost rate continues to increase thereafter, reaching 39.4 per cent in 2060 and 68.5 per cent in 2100 because of the stagnation of the number of contributors in the long term, while the number of beneficiaries continues to increase.

As complementary information, Table 4.4 presents financial projections of the OADDI branch in constant JOD.

▶ **Table 4.3. Projected revenues, expenditures and reserve, 2024–2100 (in <u>current</u> JOD millions)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	2 016	775	2 790	1 710	37	1 747	15 936	9,1	16,0
2025	2 126	830	2 956	1 823	38	1 861	17 030	9,2	16,1
2026	2 239	893	3 132	1 961	39	1 999	18 163	9,1	16,5
2027	2 356	951	3 307	2 120	40	2 160	19 310	8,9	16,9
2028	2 481	1 009	3 490	2 321	41	2 362	20 438	8,7	17,6
2029	2 612	1 065	3 677	2 550	42	2 592	21 523	8,3	18,3
2030	2 750	1 115	3 865	2 808	43	2 851	22 538	7,9	19,1
2035	3 606	1 276	4 881	4 453	49	4 501	25 866	5,7	23,0
2040	4 846	1 222	6 068	6 689	55	6 745	24 766	3,7	25,5
2045	6 475	870	7 345	9 668	63	9 731	16 727	1,7	27,5
2050	8 298	-51	8 247	13 662	72	13 734	-3 873	-0,3	30,3
2060	12 856	-5 304	7 552	27 639	95	27 735	-126 938	-4,6	39,4
2070	19 174	-21 131	-1 957	52 151	127	52 278	-497 665	-9,5	49,8
2080	28 119	-56 939	-28 821	88 073	171	88 244	-1 352 931	-15,3	57,3
2090	40 627	-130 940	-90 313	140 789	232	141 021	-3 100 532	-22,0	63,4
2100	57 694	-267 942	-210 247	215 914	316	216 230	-6 402 590	-29,6	68,5

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ **Table 4.4. Projected revenues, expenditures and reserve, 2024–2100 (in constant JOD millions)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	2 016	775	2 790	1 710	37	1 747	15 936	9,1	16,0
2025	2 075	810	2 885	1 780	37	1 817	16 626	9,2	16,1
2026	2 132	851	2 983	1 868	37	1 904	17 299	9,1	16,5
2027	2 189	884	3 073	1 970	37	2 007	17 943	8,9	16,9
2028	2 249	915	3 164	2 104	37	2 141	18 528	8,7	17,6
2029	2 310	942	3 252	2 256	37	2 292	19 035	8,3	18,3
2030	2 373	962	3 335	2 423	37	2 459	19 446	7,9	19,1
2035	2 750	973	3 723	3 396	37	3 433	19 725	5,7	23,0
2040	3 266	824	4 090	4 509	37	4 546	16 693	3,7	25,5
2045	3 858	518	4 376	5 760	38	5 797	9 965	1,7	27,5
2050	4 369	-27	4 343	7 194	38	7 232	-2 039	-0,3	30,3
2060	5 288	-2 182	3 106	11 369	39	11 409	-52 216	-4,6	39,4
2070	6 161	-6 790	-629	16 758	41	16 799	-159 921	-9,5	49,8
2080	7 059	-14 294	-7 235	22 109	43	22 152	-339 630	-15,3	57,3
2090	7 967	-25 678	-17 711	27 610	46	27 655	-608 034	-22,0	63,4
2100	8 839	-41 048	-32 209	33 078	48	33 126	-980 864	-29,6	68,5

[1] Expressed as the number of times the reserve covers current year's expenditures.

Table 4.5 presents the key moments of the future evolution of the OADDI reserve. In 2030, the OADDI branch expenditures will first exceed contributions. Expenditures will become larger than the total of contributions plus investment income in 2038 and the reserve will then start to decrease. The OADDI reserve is projected to be exhausted in 2050.

▶ **Table 4.5. Key moments of the future evolution of OADDI reserve**

	Year
Scheme's expenditure first exceeds contributions (investment income must be used to support expenditures)	2030
Scheme's expenditure first exceeds contributions plus investment income (reserve starts to decrease)	2038
Reserve is exhausted	2050

The evolution of the reserve may also be illustrated by the reserve ratio, namely the ratio of the reserve to the annual expenditure. The reserve ratio is equal to 9.1 in 2024. It is projected to gradually decrease until reserve exhaustion in 2050 (see Figure 4.2).

▶ **Figure 4.2. Reserve ratio (reserve divided by annual expenditure)**
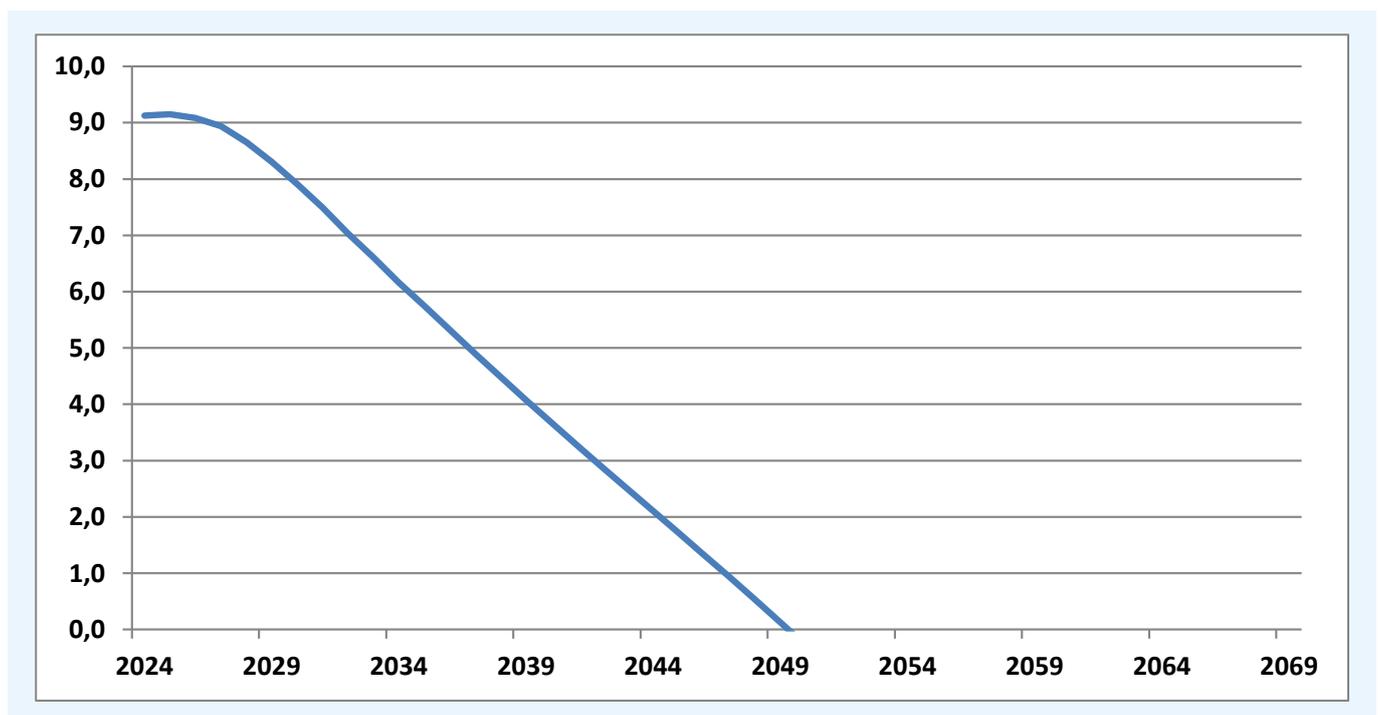
According to Article 18 of the Law, if the reserve ratio is lower than 10.0 in the tenth projection year, the Council of Ministers must, upon recommendation of the SSC Board, take necessary actions to ensure the correction of the financial position of the SSC by initiating appropriate legislative amendments. The reserve ratio is already below 10.0 in 2024 and is not projected to increase in the future if no changes are introduced in the system.

Figure 4.3 compares the pay-as-you-go (PAYG) cost rate of the scheme with the contribution rate allocated to the OADDI branch, and with the general average premium (GAP) calculated for the branch.

▶ **Figure 4.3. Projected cost rates, as percentage of insurable earnings, 2024-2100**
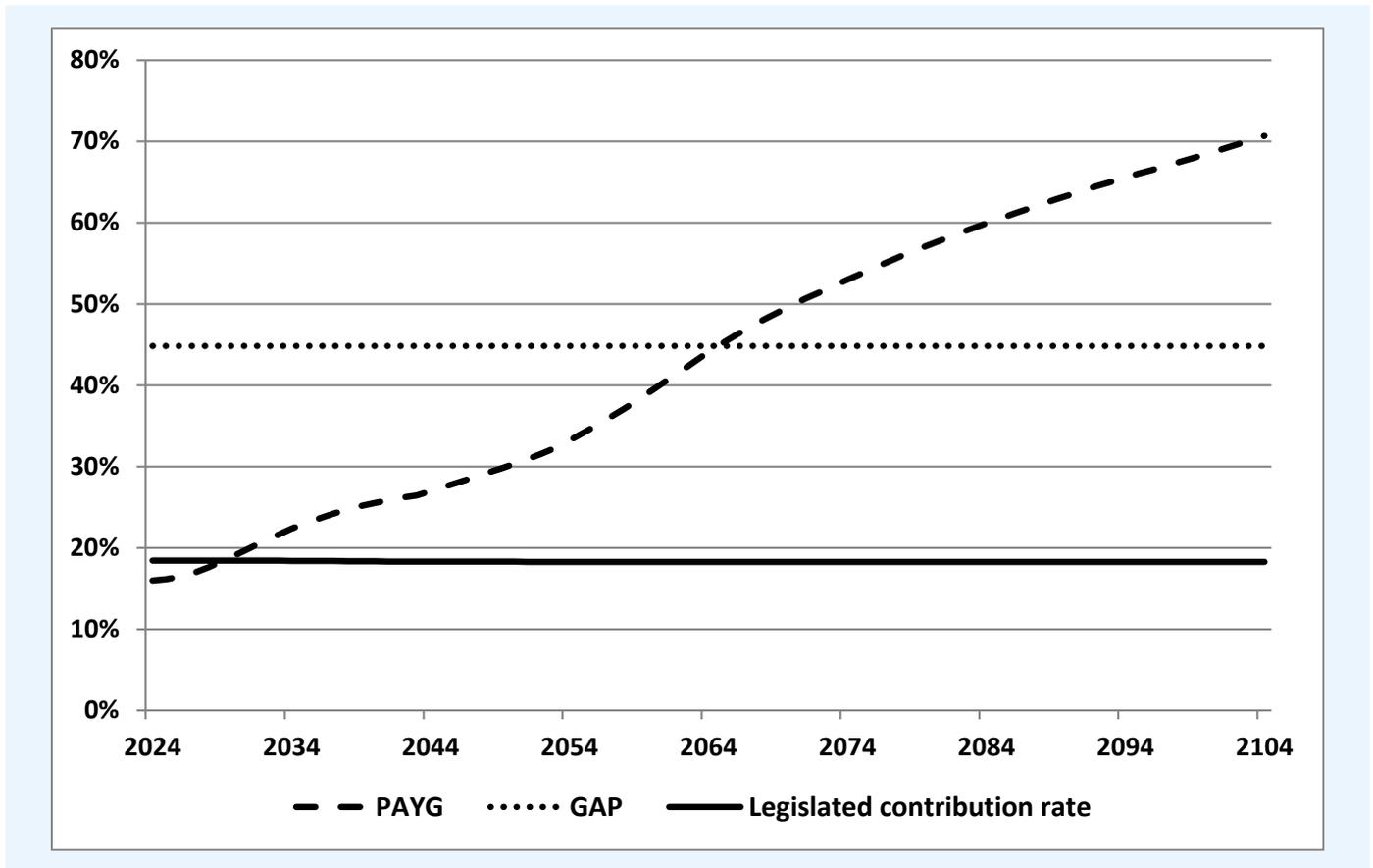
The PAYG cost rate is steadily increasing during the projection period because:

– The scheme has not yet reached a state of maturity, and the number of pensioners will grow significantly for several decades given the projected demographic evolution of the country,

– The number of contributors will increase at a slower pace than pensioners, and

– The pension level of new pensioners, even in the long run, continues to be relatively generous.

The general average premium (GAP) of the scheme represents the constant contribution rate necessary to finance all OADDI benefits over a certain period.[8] It is calculated for periods of 50 years (from 2020 to 2069) and 90 years (from 2024 to 2113). Results are presented in Table 4.6.

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[8] There are two approaches for the calculation of the general average premium. A first approach uses the reserve at the valuation date (and the investment income thereon) so that the application of the GAP during the whole projection period (50 or 90 years depending on the chosen duration) would lead to a zero reserve at the end of the period. In that case, the value of the initial reserve, plus the present value of contribution revenue (at the GAP rate) and investment income over the period is set equal the present value of benefit and administrative expenditures over the same period. Under the second approach, the initial reserve (and the investment income thereon) is not used in the calculation, so that the GAP represents the actual constant contribution rate that would balance the future contribution income and the future expenditure (and investment income on both).

▶ **Table 4.6. General average premium of the OADDI branch under different bases**

Period	General average premium	
	With consideration of the initial reserve	**Without considering the initial reserve**
2024-2073 (50 years)	29.2%	31.9%
2024-2113 (90 years)	43.2%	**44.8%**

For cost comparison in the rest of the report, we will use the GAP calculated over 90 years without considering the initial reserve.

It is observed that:

- – The PAYG cost rate of the OADDI branch will exceed 50 per cent from 2071,

- – The reserve of the branch is projected to be exhausted in 2051, and

- – The GAP (90 years) of the OADDI branch at 44.8 per cent represents more than twice the average contribution rate allocated to the OADDI branch which will converge to 18.3 percent of insured earnings in the long term.

Consequently, additional contribution rate increases and/or modifications to benefits will be necessary to ensure the long-term financial sustainability of the OADDI branch.

4.2.4. Results by sector of activity

Detailed financial projections by sector of activity for the OADDI branch are presented in Tables A5.1 to A5.3 of Annex 5. They show that the future evolution of the PAYG cost rate of OADDI follows the same trends in all sectors, even if the short-term expenditures of the Military scheme are lower.

General average premiums (GAP) of each sector of activity for the OADDI branch (calculated over 90 years without considering the initial reserve) are shown in Table 4.7.

▶ **Table 4.7. GAP (90 years) without considering the initial reserve, by sector of activity**

Sector	GAP (90 years)
Private sector	45.0%
Civil servants	47.2%
Military	40.8%
Total	**44.8%**

4.3.   Reconciliation of OADDI results with the previous valuation

This section presents a reconciliation of results of the 10th and 11th actuarial reviews for the OADDI branch. Detailed results of the comparison are presented in Table 4.21.

4.3.1. Shift of the period considered for the GAP calculation

The shift of the 90-year period considered for the calculation of the GAP (2024-2113 instead of 2020-2109) results in an increase of the GAP by 1.7 per cent.

4.3.2. Modifications to the actuarial model

Adjustments were made to the actuarial model:

— Correction to the application of the indexation mechanism (application of the indexation limit first, with subsequent distribution of the indexation fund to all pensioners) and more precise projection of the indexed versus non-indexed (supplements) portions of pensions: increase of the GAP by 0.6 per cent.

— Corrected application of the density factor in the determination of the wage bill used to calculate contribution income: increase of the GAP by 1.3 per cent.

4.3.3.   Legislative changes

Two changes had material impacts on the scheme:

— Increases of minimum insured earnings in 2020, 2021, 2022 and 2023 (increase the GAP by 0.5 per cent).

— Modification of the contribution rate for Military (now determined with reference to GDP growth). This element does not affect the GAP but shortens the period before reserve exhaustion by 1 year.

The increase of minimum pensions in 2020 was already considered in the last valuation.

4.3.4.   Experience of the scheme during the period 2020-2023

The following results of the period 2020-2023 affected the financial situation of the scheme at the valuation date:

— The difference in the number and structure of the insured population as of the valuation date, compared to the projection of the last valuation, increases the GAP by 1.5 per cent.

— The new accumulated service of members as of 2023 decreases the GAP by 0.6 per cent.

— The updated salaries as of 2023 increase the GAP by 1.5 per cent.

— The difference in the number of pensioners and average pensions in 2023, compared to projection of the last valuation, causes a decrease of 0.1 per cent of the GAP.

— The observed difference of the maximum insurable earnings in 2023 decreases the GAP by 0.8 percent.

4.3.5.   Modification of assumptions

The main changes in assumptions are:

— Mortality rates: increase of the GAP by 1.3 per cent.

— Two elements concern the projection of the SSC covered population. First, the total number of SSC insured persons is projected to increase less than in the last valuation. Second, a better classification of insured persons by category (Old, Current, Current-relaxed and New), due to an improved database, results in more people classified as "New" for whom retirement conditions are less generous. These elements result in a global decrease of the GAP by 3.2 per cent and an extension of the period before reserve exhaustion by 4 years.

— Retirement and invalidity rates: increase of the GAP by 1.0 per cent.

— Density of contributions: increase of the GAP by 0.4 per cent.

— Inflation assumption: no significant impact on the GAP.

— Salary growth assumption: increase of the GAP by 2.2 per cent.

— Rate of return assumption: increase of the GAP by 0.1 per cent.

4.3.6.   Global impact

The GAP calculated over 90 years is higher in the 11th valuation (44.8 per cent) compared to the 10th valuation (37.5 per cent). The year of reserve exhaustion has moved from 2061 in the last valuation to 2049 in the present valuation.

▶   **Table 4.8.   Reconciliation of the 10th and 11th actuarial reviews (OADDI)**

	General average premium	Year of reserve exhaustion	Period considered
10th Actuarial Review	**37.5%**	**2061**	**2020-2109**
Period for the calculation of the GAP	39.2%	2061	2024-2113
Modifications to the actuarial model	41.0%	2059	2024-2113
Legislative changes	41.5%	2058	2024-2113
Experience of the period 2020-2023	42.9%	2052	2024-2113
Modification of assumptions	44.8%	2050	2024-2113
11th Actuarial Review	**44.8%**	**2050**	**2024-2113**

4.4.   **Sensitivity tests**

Projections include an extensive set of demographic, economic and system-specific assumptions. Actual experience will inevitably differ from projections. This section analyses alternative assumptions regarding (1) the future evolution of coverage under the scheme, (2) real wage increases, (3) the rate of return of the fund, and (4) participation rates of women. The effect of alternative scenarios is presented for the OADDI branch and is illustrated through the GAP and the key dates of evolution of the reserve.

4.4.1.   Evolution of future SSC coverage

Under the baseline scenario of the valuation, it is assumed that the SSC insured population will increase in the future in line with the growth of the total employed population in the country, thus resulting in a global coverage rate of 70.5 per cent constant over time. Under the optimistic scenario, the present coverage rate of 70.5 per cent will increase to 80 per cent of total employment in 2070 and will remain at this percentage thereafter. Under the pessimistic scenario, the present coverage rate of 70.5 per cent will decrease to 50 per cent of total employment in 2070 and will remain at this percentage thereafter.

The different coverage scenarios are illustrated in Figure A4.4.

▶ **Figure 4.4. Comparison of the number of SSC contributors (base scenario vs sensitivity tests)**
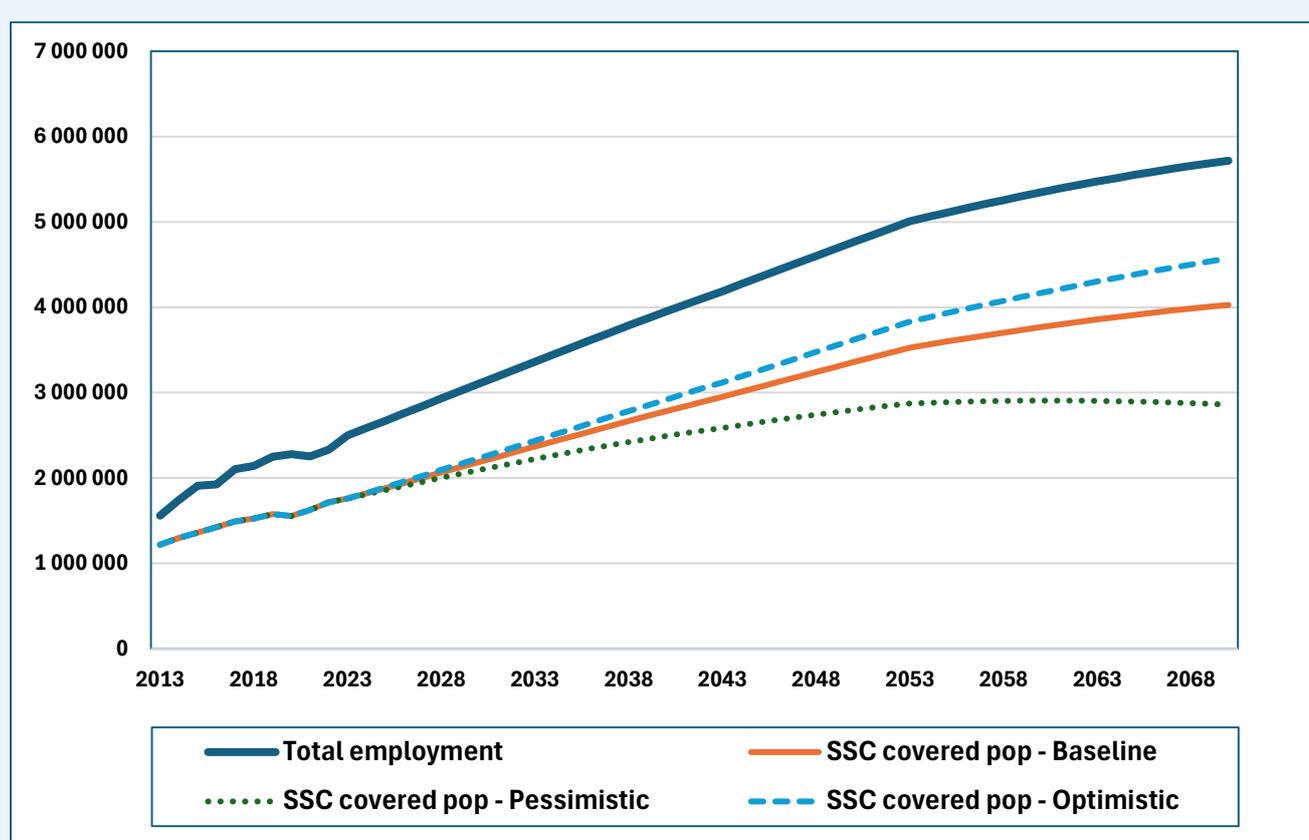
Under the first sensitivity test, the GAP would decrease from 44.8 to 43.7 per cent. The reserve would be exhausted only 1 years later. Under the second test, the GAP would increase to 48.1 per cent and the reserve would be exhausted in 2048.

▶ **Table 4.9. Sensitivity test on coverage (OADDI branch)**

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario (coverage rate of 70.5%)	44.8%	2050
Sensitivity test (optimistic) (coverage rate increasing to 80.0%)	43.7%	2051
Sensitivity test (pessimistic) (coverage rate decreasing to 50.0%)	48.1%	2048

4.4.2. Real wage increase (productivity)

The results of the valuation are sensitive to the assumed long-term productivity, translated into the difference between the assumed future average wage increase and the inflation rate (the real wage increase). Under the base scenario, the annual real wage increase is 1.2 per cent in long term. A first sensitivity test assumes a higher real wage increase at 1.5 per cent per year in long term. Under a second test, the real wage increase would be 0.8 per cent per annum. Under the first sensitivity test, the GAP of the OADDI branch would decrease from 44.8 to 40.7 per cent and the reserve would be exhausted three years later (see Table 4.10). Under the second test, the GAP would increase to 45.0 per cent.

▶ **Table 4.10. Sensitivity test on real wage increase (productivity) (OADDI branch)**

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario (1.2% in long term)	44.8%	2050
Sensitivity test (optimistic) (1.5% in long term)	40.7%	2053
Sensitivity test (pessimistic) (0.8% in long term)	45.0%	2048

4.4.3. Rate of return of the fund

Under the base scenario, the nominal rate of return of the fund is 4.7 percent on average for the period 2024-2113. A first sensitivity test has been performed by assuming a nominal rate of return of 5.7 per cent for the same period. Under that scenario, the GAP of the OADDI branch decreases from 44.8 to 40.6 per cent and the reserve is exhausted 2 years later (see Table 4.11). Under a second test, the nominal rate of return of the fund is lower at 3.7 per cent on average for the period 2024-2113. Under this second test, the GAP would increase to 49.2 per cent.

▶ **Table 4.11. Sensitivity test on rate of return (OADDI branch)**

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario (4.7% on average over period 2024-2113)	44.8%	2050
Sensitivity test (optimistic) (5.7% on average over period 2024-2113)	40.6%	2052
Sensitivity test (pessimistic) (3.7% on average over period 2024-2113)	49.2%	2048

4.4.4. Labour force participation of women

Under the base scenario, the global participation rate of women would increase from 15.8 per cent in 2023 to 40 per cent in 2100. Under the sensitivity test, it is assumed that the participation rate of women will be limited to 25 per cent in 2100. This sensitivity test may be associated with a scenario where the fertility rate of women would not decrease in the future (as projected under the base scenario of the valuation) with consequent negative effects on the future participation of women in the labour force. Table 4.12 shows that under the sensitivity test, the GAP would increase from 44.8 to 46.1 per cent.

▶ **Table 4.12. Sensitivity test on labour force participation of women (OADDI branch)**

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario (increase from 15.8% in 2023 to 40% in 2100)	44.8%	2050
Sensitivity test (no increase)	46.1%	2049

4.4.5.   Combination of sensitivity tests

This subsection presents the effect of combining different sensitivity tests described above. A global optimistic and a global pessimistic scenario were thus simulated as follows:

Base scenario

- Coverage: SSC insured population will increase in the future in line with the growth of the total employed population in the country, resulting in a constant coverage rate of 70.5 per cent.
- Real wage growth: 1.2% in long term
- Rate of return of the fund: 4.7% on average over period 2024-2113

Optimistic scenario

- Coverage: the present coverage rate of 70.5 per cent will increase to 80 per cent of total employment in 2070 and will remain at this percentage thereafter.
- Real wage growth: 1.5% in long term
- Rate of return of the fund: 5.7% on average over period 2024-2113

Pessimistic scenario

- Coverage: the present coverage rate of 70.5 per cent will decrease to 50 per cent of total employment in 2070 and will remain at this percentage thereafter.
- Real wage growth: 0.8% in long term
- Rate of return of the fund: 3.7% on average over period 2024-2113

When combining the different optimistic scenarios above (on coverage, real wage growth and rate of return), the GAP would decrease from 44.8 to 36.4 per cent, as shown in Table 4.13, but still significantly higher than the average contribution rate of the scheme (18.3 per cent). In the case of the pessimistic scenario, the GAP of the scheme would reach 58.0 per cent and the reserve would be exhausted in 2045.

▶   **Table 4.13. Combined sensitivity tests (on coverage, real wage growth and rate of return)**

Scenario	GAP (% of insurable earnings)	Year of reserve exhaustion
Base scenario	44.8%	2050
Sensitivity test combined – Optimistic	36.4%	2057
Sensitivity test combined – Pessimistic	58.0%	2045

4.5.   Work injury benefits

Work injury benefits include Injury daily allowance, Disablement pensions, Disablement grants, Survivors' benefits, and reimbursement of medical expenses. Demographic projections regarding pensions and grants are presented in Table 4.14. The number of disablement pensions is projected to increase significantly during the projection period, in line with the increase of the insured population, the ageing of the population and the maturing process of the branch. It is noteworthy that the average degree of work-related disability decreases with age (see Table A3.13 of Annex 3).

▶ **Table 4.14. Projected number of pensioners and grants of the Work injury branch, 2024–2100**

Year	Disablement pensions	Disablement grants	Survivors
2024	5 150	3 825	14 354
2025	5 439	3 935	14 507
2026	5 735	4 033	14 634
2027	6 037	4 131	14 724
2028	6 345	4 228	14 823
2029	6 658	4 325	14 917
2030	6 976	4 430	14 978
2035	8 657	4 951	15 530
2040	10 467	5 464	15 731
2045	12 378	5 968	15 888
2050	14 387	6 509	16 050
2060	18 599	7 272	15 772
2070	22 637	7 819	14 221
2080	26 143	8 105	12 641
2090	28 860	8 074	11 448
2100	30 830	7 900	10 317

Other Work injury benefits (Injury allowances and reimbursement of medical expenses) are performed by using development factors based on recent observed benefit experience. The number of beneficiaries is not projected specifically. The projection of expenditures for those benefits is presented in Table 4.15.

▶ **Table 4.15. Projected expenditures on short-term Work injury benefits, 2024–2100 (in million JOD)**

Year	Injury allowance	Medical expenses
2024	4.8	10.6
2025	4.8	10.7
2026	5.1	11.2
2027	5.3	11.8
2028	5.6	12.5
2029	5.9	13.2
2030	6.3	13.9
2035	8.2	18.0
2040	10.5	22.9
2045	13.3	28.6
2050	16.9	35.5
2060	26.1	51.6
2070	38.8	70.9

2080	56.3	93.2
2090	81.0	119.5
2100	115.3	151.0

Financial projections of the Work injury branch in current JOD are presented in Table 4.16. Under the WI branch, the contribution rate may be reduced to 1.0 per cent of earnings (instead of 2.0 per cent) for public sector employers if the employer assumes separately the cost of temporary disability benefits (daily injury allowances and medical expenses). Hence, the contribution rate of the WI branch used for projections has been established at 1.5 per cent of insured earnings to reflect that provision.

This net weighted contribution rate of 1.50 per cent may be compared to a GAP of 0.33 per cent associated with WI benefits, showing that the contribution rate allocated to the WI branch is more than sufficient to support the benefit expenditures of the branch. It would be possible to reduce the basic contribution rate of the WI branch to 1.0 per cent (instead of 2.0 percent), while maintaining sufficient reserves for the whole projection period, and to re-allocate the difference to the OADDI branch. In that case, the contribution rate of the WI branch would be 1.0 per cent for employers not offering temporary disability benefits and 0.5 per cent for employers offering such benefits (or estimated at 0.75 per cent on average).

The SSC should evaluate the performance of the scheme (claiming process, reporting of claims). The outcome of such an evaluation could guide actions regarding benefit delivery and could include a revision of the contribution rate. As indicated earlier, the average degree of work-related disability is higher for younger workers. In that context, there could be room for more efforts towards the prevention and rehabilitation of younger workers. A study should be undertaken on this aspect before recommending any shift of financial resources to other benefit branches.

Table 4.17 presents WI financial projections in constant JOD. Table 4.18 presents WI financial projections in current JOD with the alternative average contribution rate of 0.75 per cent. Detailed financial projections by sector of activity for the Work injury branch are presented in Annex 4.

4.5.1. Financing Work injury benefits

Under the law governing SSC benefits, provisions concerning the financing of Work injury benefits are limited to the determination of contribution rates. No specific provisions deal with the method to be used for periodically adjusting contribution rates and to follow-up the funding of the branch.

According to the well-recognized international practice, the principle of financing a work injury (WI) scheme is to fund all benefits which are payable in respect of work accidents and occupational diseases which occur in a given year by contributions made by employers in the same year. Since contributions collected on an annual basis will cover all current and future costs related to claims occurring in the year, today's employers pay the full cost of today's claims.

There are two types of benefits which are payable under a WI scheme:

–   *Short-term benefits* which are normally payable for less than one year (temporary incapacity benefits, medical care and funeral grants); and

–   *Long-term benefits* which may be payable for the lifetime of beneficiaries (permanent disability and survivors' pensions)

In any year, contributions must be sufficient to pay the short-term benefits and to set up a fund that will support the long-term benefits arising from claims in the year.

4.5.1.1. Short-term benefits

For short-term benefits, the average incidence (frequency) and the average severity (duration) of temporary incapacity claims normally vary little from year to year. Most temporary incapacity benefit payments terminate within one year, either due to recovery or assessment of permanent disability. The benefit is directly related to the injured worker's earnings, and the pay-as-you-go (PAYG) financial system is appropriate for financing temporary incapacity benefits. Under the PAYG system, the contribution rate is set at a level which will produce sufficient funds to pay the temporary incapacity benefits arising from work injuries in the year. This financial system is also used to determine the estimated costs of medical care and lump sums. Alternatively, the cost of short-term benefits may be estimated with the use of development factors reflecting the experience of recent years.

While the average incidence of work injuries or deaths normally varies little from year to year, deviations from the average occur. In a relatively small scheme, these deviations can have significant financial implications. To avoid the financial impact of unusual and unexpected experience (excessive incidence of injuries and/or deaths), a contingency reserve should be set up. The purpose of the contingency reserve is to pay benefits in the event of adverse experience and thereby maintain the stability of the contribution rates of the scheme. When the PAYG system is used for financing short-term benefits, the contingency reserve may be established at a certain multiple of annual expenditures, for example at two years of expected expenditures on benefit payments. Alternatively, if development factors are used for determining the annual cost, then the present value of the remaining benefit payments related to accidents that occurred before the valuation date will represent the reserve for these short-term benefits.

4.5.1.2. Long-term benefits

In order to pay disability and survivors' pensions, these pensions are capitalized, and the present value of the pensions is paid from contributions in the year the injury or death gave rise to the pension. This financial system is referred to as "terminal funding" or "assessment of constituent capitals".

A WI long-term benefits account should be set up into which capital values of permanent disability and survivors' pensions are transferred, investment income is credited and from which pension benefits are paid. At each actuarial valuation, pensions being paid from the WI long-term benefits account are valued and the required amount in the account is adjusted with updated mortality and interest assumptions.

4.5.1.3. Cost illustration

Based on these funding principles, the cost of the WI branch is JOD45 million in 2024, or 0.4 per cent of insured earnings.[9]

The required reserve for WI benefits in line with the funding principles described above would be JOD365 million as of 31 December 2023. This amount includes both long-term and short-term benefits. It should be used for the establishment of the WI account as of 31 December 2023.

4.5.2   Desirable data improvements

As mentioned in Section A3.3 of Appendix 3, additional data would improve the precision of WI projections on certain aspects, namely concerning (1) the degree of disablement of new WI pensioners and WI lump sum beneficiaries, and (2) the mortality experience of WI beneficiaries. The ILO can provide data templates to help SSC gathering these data.

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[9] This cost is slightly different from the one determined in Section 4.8.3 which follows the methodology used for determining the normal cost under retirement pension schemes.

▶ **Table 4.16. Work injury benefits – Projected revenues, expenditures and reserve, 2024–2100 (in <u>current</u> JOD millions) – Contribution rate 1.5 per cent (avg.)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	179	22	202	45	3	49	518	10,6	0,4
2025	189	30	219	47	3	51	687	13,6	0,4
2026	198	40	238	50	3	53	872	16,4	0,4
2027	208	49	258	52	3	56	1 074	19,2	0,4
2028	219	60	279	55	4	59	1 294	22,1	0,4
2029	231	72	303	58	4	62	1 535	24,9	0,4
2030	244	84	329	61	4	65	1 799	27,9	0,4
2035	327	165	492	77	4	82	3 534	43,3	0,4
2040	446	287	733	98	5	102	6 211	60,6	0,3
2045	600	475	1 074	123	5	129	10 279	79,7	0,3
2050	768	744	1 512	155	6	162	16 170	100,1	0,3
2060	1 190	1 556	2 746	236	8	244	35 501	145,2	0,3
2070	1 775	3 072	4 847	342	11	353	70 616	199,8	0,3
2080	2 601	5 635	8 236	484	15	499	131 923	264,3	0,3
2090	3 758	10 120	13 877	675	20	695	237 230	341,3	0,3
2100	5 334	17 415	22 750	929	27	956	413 129	432,1	0,3

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ **Table 4.17. Work injury benefits – Projected revenues, expenditures and reserve, 2024–2100 (in <u>constant</u> JOD millions) – Contribution rate 1.5 per cent (avg.)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	179	22	202	45	3	49	518	10,6	0,4
2025	184	30	214	46	3	49	670	13,6	0,4
2026	189	38	227	47	3	51	830	16,4	0,4
2027	194	46	240	49	3	52	998	19,2	0,4
2028	198	54	253	50	3	53	1 173	22,1	0,4
2029	204	63	268	51	3	54	1 357	24,9	0,4
2030	211	73	284	53	3	56	1 552	27,9	0,4
2035	249	126	375	59	3	62	2 695	43,3	0,4
2040	301	193	494	66	3	69	4 186	60,6	0,3
2045	357	283	640	74	3	77	6 123	79,7	0,3
2050	404	392	796	82	3	85	8 514	100,1	0,3
2060	490	640	1 130	97	3	101	14 603	145,2	0,3
2070	570	987	1 557	110	4	114	22 692	199,8	0,3
2080	653	1 414	2 068	122	4	125	33 117	264,3	0,3
2090	737	1 985	2 721	132	4	136	46 522	341,3	0,3
2100	817	2 668	3 485	142	4	146	63 290	432,1	0,3

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ **Table 4.18. Work injury benefits – Projected revenues, expenditures and reserve, 2024–2100 (in current JOD millions) – Contribution rate 0.75 per cent (avg.)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	90	20	110	45	3	49	426	8,8	0,4
2025	94	23	118	47	3	51	493	9,7	0,4
2026	99	27	126	50	3	53	566	10,7	0,4
2027	104	31	135	52	3	56	645	11,6	0,4
2028	109	35	144	55	4	59	731	12,5	0,4
2029	116	40	155	58	4	62	825	13,4	0,4
2030	122	44	166	61	4	65	926	14,3	0,4
2035	163	75	239	77	4	82	1 591	19,5	0,4
2040	223	121	345	98	5	102	2 617	25,5	0,3
2045	300	194	494	123	5	129	4 185	32,4	0,3
2050	384	297	682	155	6	162	6 456	40,0	0,3
2060	595	609	1 204	236	8	244	13 881	56,8	0,3
2070	887	1 190	2 078	342	11	353	27 348	77,4	0,3
2080	1 301	2 175	3 475	484	15	499	50 907	102,0	0,3
2090	1 879	3 903	5 782	675	20	695	91 492	131,6	0,3
2100	2 667	6 723	9 390	929	27	956	159 487	166,8	0,3

[1] Expressed as the number of times the reserve covers current year's expenditures.

4.6.   Maternity benefits

4.6.1.   Method of projection

The projected number of beneficiaries of Maternity benefits is determined from incidence rates based on the experience of the scheme. It appears that the incidence of Maternity benefits among SSC insured women is significantly lower than what would be expected with the application to the SSC insured women of the fertility rates observed in the general population. Women in the labour force (insured women) appear to have less children than women who are not in the labour force. In addition, there may not be full awareness of the existence of Maternity benefits by potential beneficiaries. To reflect these observations, fertility rates of the SSC insured women used for the determination of the number of Maternity beneficiaries are established at 31.2 per cent of those of the general population in 2024. This adjustment is assumed to gradually disappear over a period of 15 years, considering the projected increase of the female labour force participation and the consequent expected narrowing of the gap between the fertility rate of SSC covered women and the fertility rate of the general population.

Based on the average amount of Maternity benefits paid in recent years, an adjustment is applied on the average insured earnings of Maternity beneficiaries: it is assumed that their average earnings are 15.7 per cent higher than the average earnings of all insured women.

The adjusted fertility rates and average earnings are then used to determine the annual expenditures on Maternity benefits, which are calibrated to reproduce the expenditures appearing in the financial statements.

Administrative expenses of the Maternity branch are estimated at JOD0.6 million in 2023 (based on the ratio of contributions for the Maternity branch to the total contributions of OADDI, WI and Maternity). They are assumed to increase each year at a rate equivalent to the average of the inflation rate and the general wage growth.

4.6.2.   Demographic projection

The projected number of beneficiaries is around 15,000 per year in the early projection years, but it increases rapidly thereafter as a result of (1) the shrinking of the gap between the fertility of SSC insured women and the fertility of the general population, and (2) the increase of the population of SSC insured women. The projected number of beneficiaries reaches 44,646 in 2070 (see Table 4.19).

▶ **Table 4.19. Projected number of beneficiaries of Maternity benefits, 2024–2100**

Year	Number of SSC insured women (private sector)	Number of beneficiaries
2024	340 326	13 161
2025	358 332	15 347
2026	376 830	17 561
2027	395 628	19 839
2028	414 594	22 065
2029	432 703	24 206
2030	450 712	26 316
2040	603 727	42 235
2050	694 100	44 049
2060	767 693	46 053
2070	798 864	44 646
2080	785 866	42 524
2090	784 411	42 959
2100	774 993	41 987

4.6.3. Financial projections

Table 4.20 presents financial projections for the Maternity branch in current JOD and Table 4.21 presents financial projections for the Maternity branch in constant JOD.

The contribution rate of 0.75 per cent allocated to the branch is more than sufficient to support the projected expenditures of the branch. The contribution rate may be compared to the general average premium (GAP) of 0.43 per cent associated with this branch. However, it is not recommended at this point to reduce the contribution rate associated with Maternity benefits before experience continues to develop under the branch. Even for a short-term benefit branch, it is necessary to accumulate a certain level of reserves to prepare for unexpected fluctuations of expenditure and income in the future. Financial projections show that it will take a certain number of years, under the present contribution rate, before the reserve ratio starts to increase significantly.

The margin in excess contributions could be allocated to further expand the package of benefits to encourage the participation of pregnant and insured women in gainful employment and social security. SSC has started doing so with the launch of the programme that subsidizes the cost of childcare provision through the Maternity fund. In 2023, the SSC contribution to childcare amounted to JOR2.4 million (compared to Maternity benefits of JOR15.3 million). It is critical, however, that a clear relationship is maintained between the insured status and the eligibility to such childcare support, so that SSC is not indirectly providing general budget support to childcare providers. This is to maintain strong incentives to contribute to social security and not to divert SSC resources from their intended purpose. Inter alia, such support offered by the Maternity fund to childcare should not prevent possible improvements to maternity cash benefits in terms of amount of benefit or duration of payment.

▶ **Table 4.20. Maternity benefits – Projected revenues, expenditures and reserve, 2024–2100 (in <u>current</u> JOD millions)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	48	17	65	18	1	19	370	19.6	0.3
2025	50	20	70	21	1	22	419	19.2	0.3
2026	52	23	75	24	1	25	469	19.0	0.4
2027	54	25	80	27	1	28	521	18.8	0.4
2028	57	28	85	30	1	31	574	18.7	0.4
2029	60	31	91	33	1	34	631	18.4	0.4
2030	64	33	97	37	1	38	690	18.2	0.4
2035	86	49	135	59	1	60	1 033	17.3	0.5
2040	119	70	189	82	1	83	1 490	17.9	0.5
2045	162	102	264	101	1	102	2 180	21.4	0.5
2050	207	148	355	120	2	122	3 194	26.3	0.4
2060	320	287	607	172	2	174	6 522	37.4	0.4
2070	481	552	1 032	233	3	236	12 681	53.8	0.4
2080	708	1 013	1 720	315	4	318	23 715	74.5	0.3
2090	1 021	1 825	2 846	458	5	463	42 794	92.5	0.3
2100	1 447	3 142	4 590	650	7	658	74 542	113.4	0.3

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ **Table 4.21. Maternity benefits – Projected revenues, expenditures and reserve, 2024–2100 (in <u>constant</u> JOD millions)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	48	17	65	18	1	19	370	19.6	0.3
2025	49	19	68	20	1	21	409	19.2	0.3
2026	50	21	71	23	1	24	446	19.0	0.4
2027	51	23	74	25	1	26	484	18.8	0.4
2028	52	25	77	27	1	28	521	18.7	0.4
2029	53	27	80	29	1	30	558	18.4	0.4
2030	55	29	84	32	1	33	595	18.2	0.4
2035	65	38	103	45	1	45	788	17.3	0.5
2040	80	47	127	55	1	56	1 004	17.9	0.5
2045	97	61	157	60	1	61	1 299	21.4	0.5
2050	109	78	187	63	1	64	1 682	26.3	0.4
2060	132	118	250	71	1	72	2 683	37.4	0.4
2070	154	177	332	75	1	76	4 075	53.8	0.4
2080	178	254	432	79	1	80	5 953	74.5	0.3
2090	200	358	558	90	1	91	8 392	92.5	0.3
2100	222	481	703	100	1	101	11 420	113.4	0.3

[1] Expressed as the number of times the reserve covers current year's expenditures.

4.7.   Unemployment benefits

At the date of this report, amendments the Social Security Law are under study at Parliament for significantly changing unemployment benefits with the introduction of pooling features. The authors of the present report consider these amendments as a subsequent event that is not considered in this valuation.

The unemployment scheme, as applicable at the valuation date, is in fact a savings account from which allowances may be drawn in case of unemployment. The person must have contributed to the OADDI scheme for at least 36 months to be eligible for unemployment benefits. In addition, there is a limit of three unemployment spells during which an individual may collect unemployment allowances during his/her career. In addition:

- Benefits are paid for up to 3 months with contributions paid for less than 180 months; up to 6 months with contributions paid for 180 months or more.

- The amount of the unemployment allowance is 75% of the covered wage for the first month, 65% for the second month, 55% for the third month and 45% for the fourth to the sixth month.

- Each insured person is assigned an individual account which is credited with contributions paid and reduced by benefits received by the person. Any deficit in the individual account when a benefit becomes payable under the SSC is deducted from benefits payable. If there remains a positive accumulated unemployment account at retirement, it is paid to the person.

Following amendments introduced in 2019, withdrawals from individual accounts are now allowed for education and for medical treatment. Moreover, as part of COVID support measures adopted by the Jordan government, the SSC unemployment fund has been used to finance targeted benefits to unemployment workers since March 2020.

The number of beneficiaries of the unemployment scheme is calculated as the product of the covered population (private sector), the unemployment rate, the eligibility rate and the take-up rate, for each age, gender and projection year. These elements are established as follows:

Coverage. In accordance with the provisions of the law, coverage is limited to workers of the private sector.

Unemployment rate and duration. General unemployment rates of the macroeconomic framework of the valuation are first considered. In addition, SSC data on the duration of unemployment by gender for the period 2020-2023 were used to determine an assumed duration of unemployment (see Table 4.22).

▶   **Table 4.22. Assumed duration of unemployment, by gender**

Duration of unemployment (in months)	Male	Female
1	15.2%	8.0%
2	11.7%	8.8%
3	4.6%	3.3%
4	4.6%	3.3%
5	4.6%	3.3%
6 or more	59.2%	73.4%
Total	**100.0%**	**100.0%**

Eligibility. From data on past service distributions, the population of eligible contributors is isolated, considering persons with at least three years of contribution under OADDI (for eligibility). In addition, for

the extension of duration of benefit payment to 6 months, the model considers only those with 15 years of contribution or more under the unemployment benefit scheme.

Take-up rates. Take-up rate reflect the actual unemployment claims compared to the theoretical number that would result from the application of general unemployment rates. Based on contribution credits, a matrix of take-up rates by number of years of contribution and projection year is determined. Take-up rates are assumed to increase over time (until 2043) as the scheme will mature (see Table 4.23). Financial projections in short-term are adjusted to fit SSC experience.

▶ **Table 4.23. Unemployment benefits take-up rates**

Year	Take-up rates
2016	15.4%
2017	16.8%
2018	23.9%
2019	46.7%
2020 *	215.0%
2021 *	96.9%
2022	23.7%
2023	23.1%
2024	30.4%
2025	30.9%
2030	33.4%
2040	38.5%
2043+	40.0%

* Special programmes were introduced to support workers during the Covid-19 pandemic. The programmes were financed through the unemployment benefit fund.

Withdrawals for health or education. It is assumed the number of persons making withdrawals from their unemployment account for health or education purposes will represent each year 1,56% of the number of active insured of the private sector, with an average amount of withdrawal of JOD 440 in 2024 (indexed annually with the average wage growth afterward). These frequency and average amount are based on the experience of recent years.

The projected number of unemployed insured persons in the private sector and the projected number of unemployment benefits recipients are presented in Table 4.24. The number of beneficiaries for 2024 has been calibrated to fit with the experience of the first 8 months of the year. The number of beneficiaries in this table includes persons who reach the retirement age and claim the balance of their individual unemployment account at that time.

▶ **Table 4.24. Projected number of beneficiaries of unemployment benefits, 2024-2070**

Year	Number of unemployed insured persons (private sector)		Number of beneficiaries	
	Male	**Female**	**Male**	**Female**
2024	114 463	81 457	26 828	10 089
2025	114 695	84 726	28 160	11 390
2026	115 120	88 000	29 483	12 735
2027	115 696	91 302	30 700	14 113
2028	116 491	94 632	32 083	15 707
2029	117 039	97 629	33 155	17 107
2030	117 827	100 603	34 223	18 531
2040	131 785	125 898	46 908	36 847
2050	151 501	144 458	62 255	51 642
2060	164 234	158 875	72 763	62 712
2070	174 035	162 405	77 015	67 337

Table 4.25 shows the future evolution of the unemployment fund based on these assumptions. Table 4.26 presents financial projections on a constant JOD basis. The reserve amount as of the valuation date was set equal to the sum of net assets of the individual accounts (considering sums to be received from individuals with negative accounts). We assume that this corresponds to the total unemployment fund value provided by SSC as of 31 December 2023.

As shown in Table 4.25, important fund accumulations are projected over time given the legal constraints on the collection of benefits (only three months of allowance during the first 15 years of operation of the scheme and maximum of three unemployment benefit spells during the career).

The length of the projection period for unemployment benefits is normally shorter than the period used for pensions. The appropriate approach for unemployment benefits is to cover at least two cycles of economic expansion and recession, which would probably mean making projections for a period of 10 to 15 years. In the past, actuarial valuations of the SSC presented actuarial projections for the same long duration as the other benefit branches. This is also done in the present valuation (in Tables 4.25. and 4.26) to facilitate comparison with previous valuations. However, given the upcoming amendments to the law that will change the current unemployment benefits into real unemployment insurance with pooling features, a curtailment of the projection period for UI should take place in future actuarial reviews.

4.7.1. Risk Factors with the design of the UI Scheme

Financial projections of the unemployment scheme are not very useful from an actuarial perspective since the unemployment scheme is a savings mechanism that allows certain withdrawals during the career (in case of unemployment or other specific purposes) and pays back the accumulated account at retirement.[10] The aggregate value of the unemployment benefit fund will always be in balance because, for the SSC, any withdrawal by an individual will either come from the person's accumulated savings or be recovered from eventual benefits due to the person. In that context, SSC's financial reporting should indicate that, de facto, individual unemployment accounts as well as the global unemployment fund represent funds held in trust.

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[10] Financial projections could be useful, however, for investment managers at the SSIF or for administration planning purposes.

These funds should not be used for supporting any other component of the social security system, either pensions, work injury or maternity benefits.

An analysis of individual cases reveals that SSC contributors will have the possibility to experience only a small number of unemployment benefit spells over their career because of the low level of the contribution rate of the scheme. With a contribution rate of 1.5 percent, it is estimated that it would take 10 years to accumulate sufficient funds to pay for 3 months of unemployment benefits, hence it would only be possible to collect benefits three times during a typical career.

In addition, the use of the unemployment fund in 2020 and 2021 for supporting unemployed workers during the pandemic, plus the new provisions allowing withdrawals for health and education needs, affect the ability of the scheme to respond to future economic shocks, especially for the most vulnerable workers. This problem is partially addressed through the withdrawal policy (allowing Jordanians to overdraft their individual accounts), but with resulting negative impacts on old-age pension adequacy.

The ILO reiterates that the SSC unemployment benefit scheme does not involve any form of risk pooling. In addition, contrary to unemployment insurance principles, benefits are paid even if someone is not looking for, or even available for, a job. Hence the SSC unemployment scheme, in its current form, does not meet the requirements of ILO Convention 102 (Social Security Minimum Standards) and Convention 168 (Employment Promotion and Protection Against Unemployment).

▶ **Table 4.25. Unemployment benefits – Projected revenues, expenditures and reserve, 2024–2100 (in current JOD millions)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	96	11	106	48	2	50	243	4,9	0,8
2025	100	14	114	53	2	55	302	5,5	0,8
2026	105	17	121	58	2	60	363	6,0	0,9
2027	109	20	129	64	2	66	426	6,5	0,9
2028	114	23	137	70	2	73	491	6,8	1,0
2029	120	27	147	77	2	79	559	7,1	1,0
2030	127	30	157	83	2	86	630	7,4	1,0
2035	172	50	222	123	3	126	1 060	8,4	1,1
2040	238	76	314	192	3	195	1 612	8,2	1,2
2045	324	106	430	290	4	293	2 259	7,7	1,4
2050	414	141	555	387	4	391	3 019	7,7	1,4
2060	641	219	860	643	5	649	4 924	7,6	1,5
2070	961	338	1 299	947	7	954	7 689	8,1	1,5
2080	1 415	513	1 928	1 433	10	1 443	11 903	8,2	1,5
2090	2 042	757	2 799	2 146	13	2 159	17 561	8,1	1,6
2100	2 894	1 086	3 980	2 980	18	2 998	25 562	8,5	1,6

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ **Table 4.26. Unemployment benefits – Projected revenues, expenditures and reserve, 2024–2100 (in <u>constant</u> JOD millions)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	96	11	106	48	2	50	243	4,9	0,8
2025	98	13	111	51	2	53	295	5,5	0,8
2026	100	16	116	55	2	57	346	6,0	0,9
2027	101	19	120	59	2	61	396	6,5	0,9
2028	103	21	124	64	2	66	445	6,8	1,0
2029	106	24	130	68	2	70	494	7,1	1,0
2030	110	26	136	72	2	74	544	7,4	1,0
2035	131	38	169	94	2	96	808	8,4	1,1
2040	161	51	212	130	2	132	1 086	8,2	1,2
2045	193	63	256	173	2	175	1 346	7,7	1,4
2050	218	74	292	204	2	206	1 590	7,7	1,4
2060	263	90	354	265	2	267	2 025	7,6	1,5
2070	309	109	417	304	2	307	2 471	8,1	1,5
2080	355	129	484	360	2	362	2 988	8,2	1,5
2090	400	148	549	421	3	423	3 444	8,1	1,6
2100	443	166	610	457	3	459	3 916	8,5	1,6

[1] Expressed as the number of times the reserve covers current year's expenditures.

4.8.   Actuarial liabilities

As part of the terms of reference for this actuarial review, it is requested to calculate actuarial liabilities of the SSC on a closed-group basis. Normally, this type of results is not included in actuarial reviews performed by the ILO. The ILO considers that social security schemes are universal, long-term in nature and are not expected to wind up at any point in time. Social security schemes can thus continually count on the inflow of new contributors to support scheme's expenditures over time.

4.8.1.   Separation of initial reserve by benefit branch and sector of activity

In this section, the actuarial liabilities of the scheme are calculated for the separation of the reserve as at 31 December 2023 between the different benefit branches and sectors of activity (private sector, civil service, and Military personnel).

– A separation of reserves (and separate accounting) <u>by benefit branch</u> is essential to identify revenues and expenditures for each branch and to apply an adequate financing.

– A separation of the initial reserve <u>by sector of activity</u> appears necessary to meet the requirements of Article 72 of the law, namely for measuring an eventual deficit in the public sector's account that the government would have to absorb. The ILO warns that such a separation of reserves by sector will expose the deficit position of public sector's schemes in the future (and require Government's financial intervention) due to their worse demographic structure and foreseeable public sector's restructuring. Articles 72 of the law could be reconsidered with these considerations in mind.

For OADDI and WI, the suggested amount of the initial reserves separated by benefit branches and sectors of activities is based on the actuarial liabilities estimated for each branch or sector. For Maternity and Unemployment benefits, the initial reserve is determined as the amount of the observed accumulated funds at the valuation date.

The actuarial liability refers to the present value, as of the valuation date, of future payments related to pensions-in-payment and to the accrued rights of the present insured persons. The following approach is used:

– **Old-age, disability and death insurance**. The actuarial liability refers to the value of pensions accrued at the valuation date. It is assumed that future wage increases will be recognized in the calculation of pensions becoming payable after the valuation date, and that pensions in payment will continue to be indexed. However, it is assumed that no additional insurance credits are granted after the valuation date for calculating benefits (while future service accruals are considered for eligibility assessment).

– **Work injury benefits**. The actuarial liability refers to the value of future benefit payments related to accidents that occurred before the valuation date.

The total actuarial liabilities of OADDI and WI as of 31 December 2023 are estimated at JOD76,184 million. The distribution by benefit branch and sector of activity appears in Table 4.27. For the OADDI branch, the separation by sector has been calculated precisely according to the data available on insured persons and pensioners by sector. For the Work injury branch, the separation by sector has been done with reference to the expenditures on WI pensions by sector observed in 2023. Private sector attracts 58 per cent of total OADDI and WI liabilities.

▶ **Table 4.27. Distribution of actuarial liabilities as at 31 December 2023, by branch and by sector of activity (in million JOD)**

	Private sector	Civil service	Military	Total
OADDI	44 311	22 452	9 056	75 819
Work injury	224	56	85	365
Total	**44 535**	**22 508**	**9 141**	**76 184**

Based on that distribution, the recommended separation by sector and benefit branches of the reserve accumulated on 31 December 2023 appears in Table 4.28. For this separation, the reserve of the Work injury branch is set equal to the actuarial liabilities, considering that this branch is normally financed on a full funding basis, whereby yearly contributions are set equal to the cost of work injuries occurring during the year for which the cost is established. The reserve for the OADDI branch is established as the difference between the total SSC reserves and the reserves amounts established for Work injury, Maternity and Unemployment benefits, distributed by sector in proportion to the OADDI actuarial liabilities calculated for each sector.

▶ **Table 4.28. Distribution by sector of the accumulated reserve as at 31 December 2023 (in million JOD)**

Sector	Reserve				
	OADDI	Work injury	Maternity	Unemployment	Total
Private sector	8 703,4	223,9	324,1	185,9	9 437,3
Civil service	4 410,0	55,6	-	-	4 465,6
Military	1 778,7	85,9	-	-	1 864,6
Total	**14 892,2**	**365,4**	**324,1**	**185,9**	**15 767,5**

4.8.2. Actuarial balance sheets

This section presents actuarial balance sheets for the OADDI and WI branches under two approaches:

1. Closed group basis, which does not consider future contributions and benefit accruals for the current insured population.

2. Open group basis, which considers future contributions and benefit accruals for the current insured population, and future new entrants to the system.

Table 4.29 presents actuarial balance sheets for each benefit branch and each sector on a closed-group basis. The global actuarial deficit of the OADDI branch is JOD59,777 million. For the WI branch, since it has been established in the preceding subsection that the reserve of this branch is equal to the actuarial liabilities, the surplus (deficit) is equal to zero as at 31 December 2023.

Article 72 of the law provides that special accounts must be established for persons working in the public sector and for the Military, and that the Treasury must cover any deficit in these accounts. According to results presented in Table 4.29, for applying the requirements of Article 72, the Treasury would have to cover a deficit of JOD17,702 million for civil servants and JOD7,140 for the Military.

▶ **Table 4.29. Actuarial balance sheets (closed group) as at 31 December 2023, by benefit branch and sector of activity (in million JOD)**

Year	Private sector	Civil servants	Military	Total
OADDI				
Assets	8 703	4 410	1 779	14 892
Liabilities	44 311	22 452	9 056	75 819
Surplus (deficit)	-35 608	-18 042	-7 277	-60 927
Work injury				
Assets	224	56	86	365
Liabilities	224	56	86	365
Surplus (deficit)	0	0	0	0
OADDI and Work injury				
Assets	8 927	4 466	1 865	15 258
Liabilities	44 535	22 508	9 141	76 184
Surplus (deficit)	-35 608	-18 042	-7 277	-60 927

A similar exercise has been performed on an open-group basis, thus including contributions to be paid in the future by new entrants to the system and benefit expenditures that consider past and future participation to the system. Results are presented in Table 4.30 for the OADDI branch.[11] Under the open-group basis, the global deficit is JOD239,393 million. This exercise confirms the insufficiency of the present contribution rates.

▶ **Table 4.30. Actuarial balance sheets (open group) of the OADDI as at 31 December 2023, by sector of activity (in million JOD)**

Year	Private sector	Civil servants	Military	Total
Assets				
Reserve	8 703	4 410	1 779	14 892
Present value of future contributions	101 893	39 581	34 825	176 299
Total	**110 596**	**43 991**	**36 604**	**191 191**
Liabilities				
Present value of future expenditures	**261 934**	**106 668**	**63 132**	**431 734**
Surplus (deficit)	**-151 337**	**-62 677**	**-26 528**	**-240 543**

4.8.3.   Current service costs

As part of the terms of reference of the actuarial review, it has been requested to calculate the current service cost associated with each benefit branch and each sector. Current service cost is a concept normally associated with private occupational pension plans. It is used to determine the contribution level to an occupational

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[11] The exercise is not as pertinent for the WI branch because full funding under the WI branch (and the associated actuarial balance sheets) normally requires that contributions during a given year be equal to the present value of all benefits related to work injuries occurring during the same year. Hence no important surplus or deficit would emerge on a going-concern basis (if the applicable contribution rate dose not depart too much from the actual cost of the WI branch).

pension plan. It represents the cost for one additional year of credited service. In the context of the SSC, such a measure has no practical use since contribution rates are determined by law.

Table 4.31 presents current service costs for each benefit branch and by sector. It can be considered that these current service costs will be relatively constant each year until the next actuarial valuation, as a percentage of insured earnings.

▶ **Table 4.31. Current service costs for 2024 by benefit branch and sector of activity (in million JOD)**

	Private sector		Civil servants		Military		Total	
	Million JOD	% of earnings	Million JOD	% of earnings	Million JOD	% of earnings	Million JOD	% of earnings
OADDI	2 880	46,3%	1 157	46,5%	1 245	62,1%	5 282	49,3%
Work injury	31	0,4%	9	0,3%	7	0,4%	47	0,4%
Total	**2 911**	**46,8%**	**1 166**	**46,8%**	**1 252**	**62,5%**	**5 329**	**49,7%**

▶ 5. Measures to restore the financial sustainability of the OADDI branch

According to Article 18 of the law, if the reserve ratio is lower than 10 in the tenth projection year, the Council of Ministers must, upon recommendation of the SSC Board, take necessary actions to ensure the correction of the financial position of the SSC by initiating appropriate legislative amendments. In addition, Articles 72 and 73 of the Law provide that a special account is established for persons working in the public sector, and that the government undertakes to cover any deficit in this account.

Considering the financial projections presented in Section 4 and the requirements of the law, there is a need to adjust benefits and/or plan for future contribution rate increases to ensure the long-term sustainability of the social security system. The scheme offers a high replacement rate with generous retirement conditions. In addition, effective retirement ages are low when considering the present and projected life expectancies. Finally, it is important to reinforce the link between contributions paid by individual members and the benefits that they receive.

A series of modifications are analysed in this section for improving the financial situation of the OADDI branch.

5.1.   Return to the previous indexation mechanism

Pensions in payment are presently indexed annually in line with the lesser of the inflation and wage growth. The global amount of indexation is divided equally among all pensioners. This indexation mechanism weakens over time the link between contributions paid and benefits received, thus discouraging participation to the scheme. In addition, it requires to maintain a record of the relationship between former deceased participants and their survivors for the calculation of the shared indexation. It is understood that the government has introduced this indexation mechanism to make redistribution among SSC pensioners. However, tax-financed benefits represent a better tool for redistribution.

It is suggested to return to the previous indexation mechanism, thus stopping to distribute the global amount of indexation equally among all pensioners.

5.2.   Neutral early retirement reduction factors

Adjustment factors presently applied in case of early retirement are not actuarially neutral and encourage early retirement. It would be justifiable to make these factors less generous and aligned with actuarial equivalency. It is suggested to reduce early retirement pensions by 4 per cent for each year before the normal retirement age. The exact actuarial equivalence varies slightly by age, but this 4 per cent reduction, in addition to simplifying communications with SSC members, corresponds to an appropriate reduction factor over the possible range of early retirement ages, and accounts for the projected increase of life expectancy.

5.3.   Increase of retirement age

Life expectancy at age 60 is projected to increase from 17.5 years for males / 21.1 years for females in 2023 to 24.6 years for males / 27.0 years for females in 2070. It would be equitable to increase the normal retirement age under the SSC scheme to account for a projected longer time spent at retirement in the future compared to the working lifetime.

Equalization of retirement ages for all categories. It is suggested, as a first step, to merge the normal retirement ages for all insured groups (while keeping a 5-year gap between retirement ages of men and women) by increasing the retirement age such that all groups have the retirement age of the NEW group. Hence, normal retirement age would attain age 60 for males and 55 for females after that transition.

Increase or retirement age in line with life expectancy. After this retirement age equalization process for all categories or participants, it is suggested to increase the normal retirement age in line with future increases of life expectancy, at a pace of 1 year per decade, such that the ratio of the time spent at retirement to the time spent at work would remain relatively constant over time).

Early retirement. The possibility to retire early would be reduced to 5 years before the normal retirement age, instead of being established at the fixed age of 45.

Hazardous occupations. Workers in hazardous occupations and the Military would benefit from a normal retirement age 5 years lower than the other groups (age 55 for males and 50 for females). Entitlement to early retirement for these persons would represent an additional 5 years earlier. Moreover, the definition of hazardous occupation would also be tightened: no employees of the public sector would be considered in hazardous occupations, and only half of private sector jobs presently classified as hazardous occupations would qualify under the new more stringent definition.

Table 5.1 shows the normal retirement age for all groups applicable just after the proposed change, and at the end of the projection period.

▶ **Table 5.1. Normal retirement age applicable under the proposed reform**

	Private sector and Civil servants		Military and Hazardous occupations	
	Male	**Female**	**Male**	**Female**
Date of reform (2030)	60	55	55	50
2060	63	58	58	53
2100	67	62	62	57

5.4.   Elimination of dependents and fixed supplements

The SSC scheme presently pays a series of pension supplements (some linked to the number of dependents, others as fixed amounts) in addition to the pension based on the salary and years of service. These supplements are not automatically indexed and will gradually loose value over time. It is suggested to eliminate them.

5.5.   Career-average reference earnings and reduction of pension accrual rates

5.5.1. Career-average reference earnings

Pensions are presently calculated on earnings over a short period before retirement (last 2 years for the "Old" category, last year for the Military, and last 3 years for the "Current" and "New" categories). This represents an incentive, for certain members or their employers, to under-declare earnings in the early years of the career, or for boosting earnings' declaration just before retirement to obtain a higher pension.

It is proposed to calculate pensions based on earnings over the whole career of insured persons, while providing that the earnings of every past year would be valorised to account for the general wage increases between the year these earnings were received and the year the pension becomes payable. There would be a transition period to avoid an abrupt impact on pension credits already accumulated.

Using career-average reference earnings for calculating pensions reinforces the link between contributions and benefits (every contribution paid by a member will be considered in the calculation of the pension). Consequently, this would foster full declaration of earnings and encourage participation to the SSC. This could become one tool to increase formal employment. The career-average formula reduces risks for both the SSC and the worker. For the SSC, it reduces the risks of financial disequilibrium (by avoiding earnings'

manipulation), and for the worker, it reduces the risk of insufficient income at retirement (by encouraging full SSC participation throughout the career).

5.5.2. Reduction of pension accrual rates

Option 1. A first option would be to reduce the pension accrual rate from 2.5 per cent per annum to 2.0 per annum on the first JOD1,500 of earnings such that the accrual rate would be uniform at 2.0 per cent on total earnings. The change would be done prospectively i.e., for service accrued from the date of reform. It would not affect prior accumulated service.[12]

A pension accrual rate of 2.0 per cent per year is generally considered generous by international standards, as it allows to accumulate a replacement rate of 70 per cent of earnings after 35 years of contribution.

Option 2. An alternative would be to establish a first threshold of JOD400 on which an accrual rate of 1.33 per cent would apply, while the accrual rate of 2.0 per cent would apply on earnings between JOD400 and JOD1,500 (a new lower earnings ceiling).[13]

Such a reduction of the global replacement rate of SSC pension could be justified in the following context:

– a tax-financed universal pension would be introduced to guarantee basic old-age protection for lower earners, and

– additional complementary programmes would be available for workers with higher income and additional contributory capacity, allowing them to secure higher replacement rates.

5.6.   Adoption of a funding policy[14]

The SSC should establish a formal written funding policy, including its corresponding financing approach, which takes into account factors relevant to the scheme as well as the socio-economic context of the country.

The financing approach and the funding policy are two closely linked terms. The purpose of a funding policy is to establish a framework for funding a social security scheme by taking into account factors relevant to the scheme: benefit security and adequacy, stability and/or affordability of contributions, the evolution of demographic characteristics of the scheme's members, the financial situation of the scheme, the legal provisions of the scheme, and any substantive commitments such as benefit indexation.

The financing approach is the method by which a social security scheme systematically accumulates revenues to provide security for benefit payments by allocating resources in an orderly and rational manner over time,

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[12] From the reform date, the pension calculation will involve two steps: first, determining the pension amount based on the provisions in effect before reform; second, determining the pension amount based on the provisions after reform. At both steps, the pension will be calculated with the total service accrued at retirement. The pension amount from the OADDI branch will be prorated based on the service accrued before and after the reform date. As an example, an insured with 20 years of service, including 5 years of service after reform, will receive 75 per cent (15/20) of the pension calculated according to the old provisions and 25 per cent (5/20) of the pension calculated according to the new provisions.

[13] Under this scenario, it is assumed that the first and second thresholds used for the calculation of contributory earnings and pension benefits accrued from the reform date will be indexed on an annual basis, in line with salaries. Career average monthly earnings, used to define the pension benefits accrued from the reform date, will be revalorised in line with salaries. Accrued rights before reform date are preserved and will not be affected by the reform measures, which target future accruals only. After reform, since no contributions will be collected on monthly earnings exceeding the second threshold, the average monthly earnings used for the calculation of the portion of the pension accrued under the current rules (for those with average monthly earnings exceeding 1,500 JD) will be considered as the maximum between (1) the average monthly earnings assessed at reform date, and (2) the career average monthly earnings assessed at pension calculation date, up to the amount of the second threshold applicable at pension calculation date.

[14] Extracts from ISSA, ILO, *Guidelines – Actuarial Work for Social Security 2022* (Guidelines 45 and 46).

thus ensuring that resources will be available to meet benefit payment commitments and administrative expenses. The selection of the financing approach should reflect the funding policy objectives and should be fully documented through the funding policy.

Both the funding policy and the financing approach provide guidance to the actuary in the selection of valuation methodologies and assumptions in accordance with actuarial standards of practice and respecting the scheme's risk tolerance. Their consideration by the actuary is essential to ensure that the funding objectives are met with respect to securing benefit levels and payments in line with the rules, and stability and sustainability of the contribution level.

Principles

A funding policy should be a formal written document and be publicly available.

- The funding policy should define the scheme's funding objectives, describe key risks faced by the scheme and identify funding volatility factors.
- It is necessary to consider affordability and stability of contributions and benefit adequacy under the socioeconomic status of the specific country.
- The funding policy should be established by striking the right balance between benefit adequacy, contribution affordability and sustainability over a long-term horizon.
- The funding policy should specify a financing approach that is consistent with the funding policy objectives.
- The desired funding level should take into account the demographic and economic environment of the country.
- The financial approach should reflect the long-term nature of pension benefits.

Funding objectives

The desired level of pre-funding should be chosen with attention to the following considerations:

- A higher funding level is generally more suitable in situations where the expected future real rate of return on investments is higher than the expected real growth of wages, expressed as the sum of the employment growth and the real average individual salary growth. However, higher funding levels are only appropriate in situations where long-term and stable investment opportunities and investment management expertise exist. A lower funding level is more suitable in countries where the expected future real growth of wages is higher than the expected future real rate of return on investments.
- A high level of pre-funding is not suitable in countries with unstable macroeconomic conditions and/or limited investment opportunities. It is also not recommended to have a high funding level where there exist significant risks associated with high inflation, limited investment opportunities and insufficient investment management expertise, lack of investment governance resources and/or possible abuses of scheme funds.
- The level of pre-funding should be monitored and adjusted as the economic and demographic environment of the country evolves.

Once the scheme's funding objectives have been determined, the financing approach that best responds to these objectives must be chosen. Some of the financing approaches used in public social security schemes are the following:

- **PAYG**. Under this financing approach, it is not required, in principle, to set aside funds in advance and the cost of benefits and administration expenses is covered by contributions made during the same year. It is recommended that a small reserve (contingency reserve) be set up to absorb unexpected fluctuations in expenditure.

-    **Full funding**. Under this approach, it is required that sufficient funds be available at all times to cover the present value of accrued benefits in respect to past contributions for current and future beneficiaries.
-    **Partial funding**. There is a wide variety of partial funding approaches between PAYG and Full funding. Some of those are the scaled premium system, the reserve ratio system, and the general average premium.

Appendix 5 discusses financing systems and funding targets in more detail.

Automatic adjustment mechanisms

The social security institution may consider the introduction of automatic adjustment mechanisms aimed at maintaining the sustainability of the scheme. Automatic adjustment of certain parameters (e.g. benefit indexation, benefit reduction, contribution rates) could be established, depending on the demographic and financial status of the scheme, based discussions and decisions of stakeholders.

Automatic adjustment mechanisms aim at maintaining the sustainability of the social security system. Such mechanisms may depend on demographic ratios of the scheme, economic parameters and/or combinations of these. The social security institution should perform a detailed analysis of the impacts of the application of such mechanisms on affordability, adequacy and sustainability of the social security scheme. Appendix 5 presents automatic adjustment mechanisms adopted in different countries.

Assessment of intergenerational transfers

The social security institution, with the assistance of the actuary, should periodically assess the level of intergenerational transfer present in the social security scheme. The extent of intergenerational transfer depends on the demographic and economic context as well as the financing approach adopted by the scheme. For example, under a pure PAYG system, current contributions are fully used to pay for benefits of previous generations, which implies intergenerational transfers. PAYG approaches with smoothed contribution rates over a certain period imply a certain amount of pre-funding of benefits, which reduce such transfers.

Even if contributors to a social security scheme generally accept that the first generations of pensioners of the scheme receive benefits that exceed the value of their contributions, it is important for the social security institution and other stakeholders to set the level of benefits and contributions in such a way as to maintain an acceptable relationship between benefits and contributions for future generations. Intergenerational equity may influence the choice of a financing strategy and the level of reserves. The actuary should develop appropriate measures of intergenerational equity. For example, these measures may include:

-    Internal rate of return for different cohorts.
-    Ratio of present value of benefits to present value of contributions over a contributor's lifetime.
-    Ratio of present value of total contributions to annual value of the pension.

5.8. Financial implications of reform measures

The financial implications of the above measures are presented in Table 5.4. It shows the cumulative impact of each measure applied successively. With the application of these parametric reforms, the GAP of the OADDI branch would decrease from 44.8 to 30.6 per cent with pension accrual rates under Option 1, and 27.3 per cent with pension accrual rates under Option 2.

To reduce the financial burden of the OADDI branch in the years just following the reform date, a scale-premium approach is recommended. It would result in contribution rates as appearing in Tables 5.2 and 5.3. With these contribution rates, the SSC fund would be at least equal to 2 times the annual expenditures until year 2100.

▶ **Table 5.2. Suggested contribution rates (scaled premium) under Option 1**

Period	On total earnings	
	Private and Civilians	**Military**
2027-2036	20.0%	25.0%
2037-2046	22.5%	27.5%
2047-2056	25.0%	30.0%
2057-2066	27.5%	32.5%
2067-2076	30.0%	35.0%
2077-2086	32.5%	37.5%
2087-2096	35.0%	40.0%

▶ **Table 5.3. Suggested contribution rates (scaled premium) under Option 2**

Period	Private and Civilians		Military	
	On earnings below JOD400	**On earnings between JOD400 and JOD1,500**	**On earnings below JOD400**	**On earnings between JOD400 and JOD1,500**
2027-2036	16.25%	23.75%	21.25%	31.25%
2037-2046	17.50%	25.00%	22.50%	32.50%
2047-2056	18.75%	26.25%	23.75%	33.75%
2057-2066	20.00%	27.50%	25.00%	35.00%
2067-2076	21.25%	28.75%	26.25%	36.25%
2077-2086	22.50%	30.00%	27.50%	37.50%
2087-2096	23.75%	31.25%	28.75%	38.75%

▶ **Table 5.4. Summary of financial implications of the different scenarios (cumulative impact)**

Reform measures	Pay-as-you-go rate (%)			General average premium (2024-2113)	Key moments of evolution of reserve		
	2030	**2060**	**2090**		**First year expenditures exceed contributions**	**Year reserve starts to decrease**	**Year of reserve exhaustion**
Status quo (base scenario)	**19.1%**	**39.4%**	**63.4%**	**44.8%**	**2030**	**2038**	**2050**
Return to previous indexation mechanism	19.1%	39.4%	63.4%	44.8%	2030	2038	2050
Neutral early retirement reduction factors	18.2%	36.7%	60.4%	42.3%	2031	2042	2054
Alignment of retirement ages for all categories	16.6%	39.3%	62.1%	43.6%	2034	2042	2053
Increase of retirement age in line with life expectancy	15.8%	34.9%	54.9%	39.2%	2035	2045	2056
Elimination of pension supplements	15.1%	33.2%	54.1%	37.9%	2038	2048	2059
Reduction of pension accrual rates (Option 1) with career-average reference earnings	**14,9%**	**27,0%**	**41,2%**	**30,6%**	**2040**	**2054**	**2066**
Reduction of pension accrual rates (Option 2) with career-average reference earnings	**15.3%**	**24.7%**	**35.2%**	**27.3%**	**2042**	**2057**	**2071**

▶ Actuarial opinion

This report was prepared as requested under Article 18 of the Social Security Law (Law Nº 1 of 2014). In our opinion,

- the data on which this report is based are sufficient and reliable,

- the assumptions used are, individually and in aggregate, reasonable and appropriate, and

- the methodology employed is appropriate and consistent with accepted actuarial practice.

Based on the results of this valuation, we hereby certify that the OADDI branch of the SSC is not financially sustainable over the period covered by the projections in this report. This means that in considering applicable financing rules and the future demographic and economic environment in which it will operate, the current assets of the SSC Fund, together with future contributions, will not be sufficient to pay all future benefits and administrative and operational expenses over the period covered by the projections in this report.

This report has been prepared, and our opinions given, in accordance with internationally accepted actuarial practice as provided by the *International Standard of Actuarial Practice 2: Financial Analysis of Social Security Programs*.

DD MMMM 2022

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▶ Appendix 1. Summary of the Social Security Law

This section presents a general overview of the key coverage, contribution, and benefit provisions of the Social Security Law (Law No 1 of 2014), with subsequent amendments.

A1.1.   Contingencies covered

The following contingencies are covered under the law:

– Old-age, disability and death insurance (regular old-age pension, early old-age pension, lump-sum, disability pension and survivors' benefits)
– Work injury (medical expenses, injury allowance, disablement pensions and death benefit)
– Maternity
– Unemployment
– Health

Maternity and Unemployment have been introduced in September 2011 and cover only workers of the private sector. Health insurance is not yet implemented.

A1.2.   Persons covered

The law applies to:

– Employees older than age 16 working in private establishments
– Government and public sector employees hired since 1995 (military since 2003)
– Employees of universities, municipalities, and village councils
– Jordanian citizens working at diplomatic missions or for international organizations
– Self-employed persons are compulsorily covered since 1 January 2015

Voluntary coverage is possible for all Jordanian citizens residing in the Kingdom or abroad provided they are less than age 60 for males and 55 for females upon their first contribution. Voluntary contributors are covered only for old-age, disability (non-work) and death insurance.

Exclusions from coverage:

– Civil servants hired before 1995, and military staff hired before 2003
– Foreign employees in international organizations or foreign political or military missions
– Persons with irregular employment relationship

A1.3.   Minimum and maximum insurable earnings

Minimum insurable earnings follow the official minimum wage in Jordan. Effective monthly minimum wage is the following:

Effective date	Jordanian	Non-Jordanian
01/01/2020	220	190
01/01/2021	260	230
01/01/2022	260	245
01/01/2023	260	260

Maximum insurable earnings depend on the date of first enrolment in SSC:

- Persons who joined the scheme before 01/05/2010: JOD5,000 (or his/her wage if exceeding JOD5,000 at that date)
- Military personnel: JOD5,000
- Persons who joined the scheme between 01/05/2010 and 28/02/2014: the highest of JOD3,000 and five times the average monthly wage of SSC contributors
- Persons who joined the scheme from 01/03/2014: JOD3,000 indexed with inflation. Maximum insurable earnings were as follows since 2014 for this group:

Year	Maximum insurable earnings
2014	3,000
2015	3,084
2016	3,084
2017	3,084
2018	3,186
2019	3,328
2020	3,338
2021	3,349
2022	3,394
2023	3,538

The JOD5,000 threshold applicable to certain groups above will be indexed with inflation once the indexed JOD3,000 have reached JOD5,000.

A1.4. Financing

Contribution rates are as follows as at 31 December 2023:

	Private sector		Public sector			
			Civil service		Military	
	Employees	**Employer**	**Employees**	**Employer**	**Employees**	**Employer**
Old-age, disability and death	6.5%	11.0%	6.5%	11.0%	6.5%	17.0%[1]
Work injury[2]	–	2.0%	–	2.0%	–	Included above
Unemployment	1.0%	0.5%	–	–	–	–
Maternity	–	0.75%	–	–	–	–

[1] The contribution rate of the employer includes the contribution for the work injury branch (assumed to be equal to 1.0% for the purpose of the valuation). The contribution rate of the employer varies according to the real GDP growth of the country:
- Real GDP growth less than 5%: 17.0% contribution rate;
- Real GDP growth is exactly 5%: 21.5% contribution rate;
- Real GDP growth is more than 5%: 26% contribution rate.

[2] For Work injury benefits, the employer's contribution rate may be reduced to 1.0% of earnings if the employer assumes separately the cost of temporary disability benefits (daily allowances and medical expenses). This applies only to public sector since 1/1/2020.

Note: An additional contribution of 1% is charged for hazardous jobs, paid by the employer.

A1.4.1. Contribution adjustments

– **Youth employment:** Private sector employers may reduce their contribution to the OADDI branch by up to 50% for new insured personnel under the age of 30.

– **Self-employed:** Since 2020, own account workers (who are not owners of establishments) contribute at reduced rates to the old-age insurance branch (16.5 per cent) and to the death and disability branch (1.0 per cent). Old-age credits are fully recognized for eligibility purposes.

A1.4.2. Funding policy

A special account is established for the public sector. The financial position of this account is determined every three years (as part of the actuarial review). The government must fill any deficit in the account. This account is credited with contributions paid on behalf of public sector workers, interest on contribution payment delays, penalties, investment return and sums paid by the government to fill any deficit in the account.

Article 18 of the Law mentions that if the reserve ratio (reserve divided by annual expenditures) of the tenth projection year is lower than 10, the Council of Ministers must, upon recommendation of the SSC Board, take the necessary action to ensure the correction of the financial position of the SSC by initiating appropriate legislative amendments.

A1.5.   Categories of insured persons

Insured persons are divided into four categories:

- **OLD:** accumulated at least 18 years of contribution for males and 15 years for females before 1 March 2014. Also includes those who reached retirement age and accumulated 15 years of contribution by 1 March 2014.

    i)   The Military personnel is governed by provisions of the previous legislation applicable until 2001. Apart for some exceptions, they are generally treated, for eligibility and benefit calculation, as the OLD category (differences are indicated where appropriate).

- **CURRENT:** contributed for the first time before 1 October 2019 but did not accumulate 18 years of contribution for males and 15 years for females before 1 March 2014, nor reached age 42 on 1 March 2014.

- **CURRENT (RELAXED CONDITIONS):** contributed for the first time before 1 October 2019, did not accumulate 18 years of contribution for males and 15 years for females before 1 March 2014, but reached age 42 before 1 March 2014.

- **NEW:** Contributed for the first time on 1 October 2019 or after.

A1.6.   Benefit provisions

A1.6.1. Old-age

Eligibility

Normal retirement: All insured categories are eligible for normal retirement at age 60 for males and 55 for females, with 15 years of contribution.

Early retirement:

- **OLD**: from age 45 with 18 years of contribution for males and 15 years for females. For the Military, age 45 with 20 years of contribution for males and females.
- **CURRENT**: age 50 with 21 years of contribution for males and 19 years for females, or age 45 with 25 years of contribution, for both males and females.
- **CURRENT (RELAXED CONDITIONS)**:

Person's age at 1 March 2014	Requirements to qualify for early retirement		
	Minimum retirement age		Minimum number of years of contribution
42	48	Male	21
		Female	18
43	47	Male	20
		Female	17
44	46	Male	19
		Female	16
45 or more	45	Male	19
		Female	16

- **NEW:** Age 55 with 21 years of contribution for males, age 52 with 19 years of contribution for females.

Pension calculation

- **OLD**:

  The pension is equal to:

  a) 2.5% of the insured's average monthly wage in the <u>last 24 months</u> (for the Military, the last salary is used) times the number of years of contribution, up to a maximum of 75% of that average. The increase of the insured's average wage on which the old-age pension is calculated may not exceed 60% of the wage at the beginning of the last 60 months, nor less than 20% of that wage.

  b) In case of early retirement, the above pension is reduced as follows depending on the age of actual retirement:

Age at retirement	Reduction factor	
	Males	Females
Between 45 and 46	18%	10%
Between 46 and 47	16%	10%
Between 47 and 48	14%	10%
Between 48 and 49	12%	10%
Between 49 and 50	10%	10%
Between 50 and 51	9%	5%
Between 51 and 52	8%	5%
Between 52 and 53	7%	5%
Between 53 and 54	6%	5%
Between 54 and 55	5%	0%
Between 55 and 56	4%	–
Between 56 and 57	3%	–
Between 57 and 58	2%	–
Between 58 and 59	1%	–
Between 59 and 60	0%	–

c) A dependents' supplement is added to the above pension, expressed as a percentage of the age-adjusted pension, according to the number of dependents:

- 10% for 1 dependent
- 15% for 2 dependents
- 20% for 3 or more dependents

Eligible dependents include wife, dependent husband with a disability, son up to age 23 or disabled, unmarried dependent daughter and dependent parents, brothers and sisters.

d) A fixed supplement is added, equal to 10% of the age-adjusted pension calculated in (a), with a minimum of JOD30 and a maximum of JOD50.

- **CURRENT and CURRENT (RELAXED CONDITIONS)**:

The pension is equal to:

a) 2.5% of the insured's average monthly earnings in the last 36 months up to JOD1,500 and 2.0% above JOD1,500, multiplied by the number of years of contributions. The increase of the insured's average wage on which the old-age pension is calculated may not exceed 60% of the wage at the beginning of the last 48 months for normal retirement (60 months for early retirement), nor less than 20% of that wage.

b) In case of early retirement, reference earnings are calculated over the last 60 months, and the pension is reduced as follows depending on the age of actual retirement:

Age at retirement	Reduction factor	
	Males	Females
Between 45 and 46	20%	14%
Between 46 and 47	18%	12%
Between 47 and 48	16%	10%
Between 48 and 49	14%	8%
Between 49 and 50	12%	7%
Between 50 and 51	11%	6%
Between 51 and 52	10%	5%
Between 52 and 53	9%	4%
Between 53 and 54	8%	3%
Between 54 and 55	7%	2%
Between 55 and 56	6%	–
Between 56 and 57	5%	–
Between 57 and 58	4%	–
Between 58 and 59	3%	–
Between 59 and 60	2%	–

c) A dependents' supplement is added to the above pension, expressed as a percentage of the age-adjusted pension, according to the number of dependents:

- 12% for the first dependent (minimum JOD10, maximum JOD100)
- 6% for the second dependent (minimum JOD10, maximum JOD25)
- 6% for the third dependent (minimum JOD10, maximum JOD25)

d) A fixed supplement is added, equal to JOD20 before the normal retirement age and JOD40 from the normal retirement age.

● **NEW**:

The pension is calculated the same way as for the CURRENT category, but with higher reduction factors in case of early retirement, as follows:

Age at retirement	Reduction factor	
	Males	Females
Between 52 and 53	–	25%
Between 53 and 54	–	15%
Between 54 and 55	–	5%
Between 55 and 56	22%	–
Between 56 and 57	18%	–
Between 57 and 58	14%	–
Between 58 and 59	10%	–
Between 59 and 60	5%	–

Retirement after normal retirement age

For persons retiring after the normal retirement age (on the condition that they have at least 15 years of contribution at age 60 for males and 55 for females), the accrual rates are increased as follows:

Male			Female		
Age	First JOD1,500	Excess of JOD1,500	Age	First JOD1,500	Excess of JOD1,500
From 60 to less than 61	2.50%	2.00%	From 55 to less than 56	2.50%	2.00%
From 61 to less than 62	2.60%	2.10%	From 56 to less than 57	2.60%	2.10%
From 62 to less than 63	2.70%	2.14%	From 57 to less than 58	2.70%	2.14%
From 63 to less than 64	2.80%	2.22%	From 58 to less than 59	2.80%	2.22%
From 64 to less than 65	2.90%	2.34%	From 59 to less than 60	2.90%	2.34%
65	3.00%	2.50%	60	3.00%	2.50%

Hazardous occupations

To qualify for an early retirement pension because of working in "Hazardous Occupation" an insured must fulfil the following conditions:

- Have contributed at least 60 contributions during the last 120 contributory months preceding retirement in a job that is classified as "Hazardous".
- Reach the age of 45 at least (for male and females).
- Have contributed to the scheme at least 216 contributions for males and 180 for females.
- The normal and early retirement pensions is calculated the same way as for the "CURRENT" category.

A1.6.2. Disability (natural cause)

Eligibility

The insured must be assessed with a total or partial incapacity for work and have at least 60 months of contributions, including 24 consecutive months.

Benefits

For all categories of insured:

- In case of total disability, the pension is equal to 50% of the insured's average monthly earnings of the last 36 months on the first JOD1,500, plus 30% of the earnings above JOD1,500. In case of partial disability, the pension is equal to 75% of the above calculated pension.

- The pension is increased by 0.5% for each full year of contributions if the insured has between 5 and 10 years of contributions, or by 1% for each full year of contributions if the insured has at least 10 years of contributions.

- In case of total disability, after assessment by the SSC Medical Reference Committee, a constant-attendance allowance equal to 25% of the pension may be added subject to a maximum value equivalent to the applicable minimum wage.

- A fixed supplement of JOD40 is added.

A1.6.3. Death (natural cause)

Eligibility

The deceased has at least 24 months of contributions, including 6 consecutive months. If more than one survivor is eligible, the pension is split between survivors according to a schedule in law.

Eligible survivors include a widow, a disabled widower, the insured's male children up to age 23 or disabled, all dependent daughters if unmarried, widowed, or divorced, dependent brothers younger than age 18, dependent sisters, parents and an unborn child.

The pension for a widow, daughter, or sister is suspended on marriage, but is resumed if she is subsequently widowed or divorced.

Benefits

The pension is equal to:

- for pensioners: 100% of the pension in payment.

- for active insured persons:

    i)   50% of the insured's average monthly earnings in the last year of contributions

    ii) The pension is increased by 0.5% for each full year of contributions if the insured has between 5 and 10 years of contributions, or by 1% for each full year of contributions if the insured has at least 10 years of contributions.

    iii) A fixed supplement of JOD40 is added.

A1.6.4. Lump-sum benefit

If the employment of a person is terminated because of death, permanent natural disability, or attainment of age 60 for males and 55 for females, and the person is not eligible for a pension, the person receives a lump-sum equal to 15% of the average monthly salary of the last 24 months multiplied by the number of months of contribution. In case the period of contribution is lower than 24 months, the actual number of months is used.

A list of other categories of persons (specified by the SSC Board), who are not entitled to an old-age pension at retirement age or a permanent natural disability pension, receive a lump sum calculated as follows:

- 10% of the sum of monthly salaries on which contributions were paid, if the period of contribution is less than 10 years.

- 12% of the sum of monthly salaries on which contributions were paid, if the period of contribution is more than 10 years but less than 18 years.

> - 15% of the sum of monthly salaries on which contributions were paid, if the period of contribution is 18 years or more.

A1.6.5. Work injury

Eligibility

There is no minimum qualifying period.

Injury allowance

75% of the insured's daily earnings is paid until the insured resumes work, is assessed with a permanent disability, or dies.

Disablement pensions and grants

If the insured is assessed with a total disability, the pension is equal to 75% of the monthly earnings on the day of the injury (minimum JOD100).

For partial disability (from 30% to 74% degree of disability), the amount of the pension calculated for total disability is multiplied by the degree of disability.

For a degree of disability of less than 30%, a lump sum (grant) is paid. It is equal to the disability pension (75% of monthly earnings on the day of the injury) multiplied by the percentage degree of disability, multiplied by 36.

In case of total disability, if assessed by the SSC Medical Reference Committee, the person may receive a constant-attendance allowance equal to an additional 25% of the pension (not to exceed the minimum wage).

A fixed supplement of JOD40 is added to the pension, for both total and partial disability.

Survivor benefits

The pension is equal to 75% of the covered monthly earnings on the day of the injury. If there is more than one eligible survivor, the pension is split between them according to a schedule provided in the law.

Eligible survivors include a widow, a disabled widower, the insured's male children up to age 23 or disabled, all dependent daughters if unmarried, widowed, or divorced, dependent brothers younger than age 18, dependent sisters, parents and an unborn child.

The pension for a widow, daughter, or sister is suspended on marriage but is resumed if she is subsequently widowed or divorced.

Medical expenses

Medical treatment, hospitalization, transportation, and rehabilitation services (including artificial limbs) are provided.

A1.6.6. Funeral grant

A funeral grant of JOD700 is paid at the death of an <u>active</u> insured person (for natural or work-related death, and for beneficiaries of lump-sums).

A1.6.7. Maternity

Eligibility

Must have at least 6 months of coverage before childbirth (the requirement was 9 months between 1 September 2011 and 28 February 2014).

Benefits

100% of the insured's last monthly earnings, minus SSC contributions (6.75% in 2014), for a maximum of 10 weeks.

A1.6.8. Unemployment

Eligibility

Must have at least 36 months of coverage under OADDI (except voluntary) before the date of entitlement to Unemployment benefits. In addition, the person must have paid at least one contribution to the Unemployment scheme since 1 September 2011. Each insured is entitled to a maximum of three benefit spells during the career.

Benefits

Duration: Paid for up to 3 months with contributions during less than 180 months; up to 6 months with contributions paid for 180 months or more.

Amount: 75% of the covered wage for the first month, 65% for the second month, 55% for the third month and 45% for the fourth to sixth months. Each monthly payment is subject to a maximum of JOD500 (indexed with inflation).

Individual accounts

Each insured person is assigned an individual account credited with contributions received by the SSC and reduced by benefits paid to the person.

The residual value of the account at time of retirement, if any, is reimbursed to the person.

The individual account may be overdraft to pay unemployment benefits. For Jordanians, the possibility to overdraft the individual account is limited to 3 times the average wage of the last 3 years. Non-Jordanians may not overdraft their individual accounts. Any deficit in the individual account existing at the time a benefit becomes payable under the SSC is deducted from the benefits payable. The deduction may be spread over time.

Additional benefits

Following amendments introduced in 2019, withdrawals from individual accounts are now allowed for education and for medical treatment. Moreover, as part of COVID support measures adopted by the Jordan government, individual accounts have been used to finance targeted benefits to unemployed members since March 2020.

A1.7. Minimum pension

The minimum pension was JOD50 between 1993 and 31 May 2019. It was increased to JOD100 on 1 June 2019.

From 1 January 2020, minimum pensions were increased for Jordanians and Gazans, as follows:

- JOD160 for total disability pension (natural or work-related), and survivors' pensions (natural or work-related).

- JOD125 for old-age, early and partial disability pensions (natural or work-related). For early retirement, the minimum pension is not applied before age 55 for males and 50 for females.

A1.8.   Pension indexing

Old-age and disability pensions (after age reduction and excluding the various supplements) are indexed at the end of May of each year. The inflation adjustment is equal to the lesser of the inflation rate and the rate of growth of contributors' salaries, subject to a maximum adjustment of JOD20 per month which is indexed to inflation in May of each year (JOD20.56 in 2015, JOD20.89 in 2018, JOD21.46 in 2019, JOD21.52 in 2020, JOD21.60 in 2021, JOD21.89 in 2022 and JOD22.18 in 2023). Early-retirement and partial disablement (work-related) pensions are not subject to indexation before the normal retirement age.

The global amount of indexation of all pensioners (calculated as described above, considering the monthly maximum) is then divided equally among all pensioners.

The indexing mechanism considers that certain pension supplements are transferred to survivors in case of death of the main pensioner (hence these survivors participate to the equalized indexation mechanism). But the transferred supplements do not include family allowances associated with the old-age pension, and daily living activities allowances associated with total permanent disability pensions (natural or work -related).

▶ Appendix 2. Methodology of the Actuarial Valuation

This actuarial review makes use of the comprehensive methodology developed by the ILO for reviewing the long-term actuarial and financial status of national pension schemes. These modelling tools include a population model, an economic model, a labour force model, a wage model, a long-term benefits model, a short-term benefits model, and an employment injury model. The review has been undertaken using the version of the ILO models used for the 9th Actuarial Review of the SSC, adjusted to reflect the situation of the scheme as at 31 December 2019.

The actuarial valuation starts with a projection of the future demographic and economic environment of Jordan. Next, projection factors specifically related to the SSC are determined and used in combination with the demographic/economic framework.

A2.1. Modelling the demographic and economic environment

The use of the ILO actuarial projection model requires the development of demographic and economic assumptions related to the general population, the economic growth, the labour market and the increase and distribution of wages. Other economic assumptions relate to the future rate of return on investments, the indexation of benefits and the adjustment of parameters like the maximum insurable earnings and the future level of flat-rate benefits.

The selection of projection assumptions takes into account the recent experience of the SSC to the extent this information was available. The assumptions are selected to reflect long-term trends rather than giving undue weight to recent experience.

A2.1.1. General population

General population is projected starting with most current data on the general population, and applying appropriate mortality, fertility and migration assumptions.

A2.1.2. Economic growth

Increase of the productivity of labour, wage share of GDP and inflation rates are exogenous inputs to the economic model. The long-term GDP growth is the result of assumptions on the future evolution of the labour force, the employment rate in the labour force and labour productivity.

A2.1.3. Labour force, employment and insured population

The projection of the labour force, i.e. the number of persons available for work, is obtained by applying assumed labour force participation rates to the projected number of persons in the general population. Employment rates are assumed for the future and unemployment is calculated as the difference between labour force and employment. This exercise is performed separately for salaried and self-employed persons.

The model assumes movement of participants between the groups of active and inactive insured persons. This movement is simulated by comparing projected active insured persons for two successive years and for each age/sex cell. If the number of persons in that cell decreases by more than the number of persons dying or becoming disabled during the year (for ages at which retirement is not possible), then the difference is considered as new inactive persons. In the reverse case, it is presumed that former inactive persons re-integrate the active insured population.

A2.1.4. Wages

Based on an allocation of total GDP to capital income and to labour income, a starting average wage is calculated by dividing total wages in the GDP by the total number of employed persons.

In the medium term, real wage development is checked against the labour productivity growth. In specific labour market situations, wages might grow at a pace faster or slower than productivity. However, due to the long-term perspective of the present review, the real wage increase is assumed to gradually converge with the real increase of labour productivity. It is expected that wages will adjust to efficiency levels over time.

Wage distribution assumptions are also needed to simulate the possible impact of the social protection system on the distribution of income, for example through minimum and maximum pension provisions. Assumptions on the differentiation of wages by age and gender are established, as well as assumptions on the dispersion of wages between income groups.

A2.2.   Modelling the financial development of the SSC

The present actuarial review addresses all revenue and expenditure items of the SSC. The most important components of this budget concern long-term (pension) benefits. This section focuses on them.

For Maternity benefits, income and expenditures are projected using simple projection methods based on fertility assumptions of the general demographic framework. For Work injury benefits, income and expenditures are projected using a model specifically developed for that branch.

Projections are performed for each gender separately. Groups of insured are separated by sector (private sector, civil servants and military personnel) and by categories of insured (Old, Current, Current-Relaxed conditions and New).

A2.2.1. Purpose of pension projections

The purpose of the pension model is twofold. First, it is used to assess the financial viability of the Long-term benefits branch. This refers to the measure of the long-term balance between income and expenditure of the scheme. In case of imbalance, a revision of the contribution rate or the benefit structure is recommended. Second, the model may be used to examine the financial impact of different reform options, thus assisting policymakers in the design of benefit and financing provisions. More specifically, the pension model is used to develop long-term projections of expenditures and insurable earnings under the scheme, for the purpose of:

- Assessing the options to build up a contingency or a technical reserve;

- Proposing schedules of contribution rates consistent with the funding objective; and

- Testing how the system reacts to changing economic and demographic conditions.

A2.2.2. Pension data and assumptions

Pension projections require the demographic and macro-economic frame already described and, in addition, a set of assumptions specific to the SSC.

The database as of the valuation date includes the insured population by active and inactive status, the distribution of insurable wages among contributors, the distribution of past credited service and pensions in payment. Data are disaggregated by age and gender.

Scheme-specific assumptions such as the disability incidence rates and the distribution of retirement by age are determined with reference to the scheme provisions and the historical experience under the scheme.

The projection of the annual investment income requires information on the existing assets on the valuation date. A rate of return assumption is formulated by considering the nature of the scheme's assets, the past performance of the fund, the scheme's investment policy and assumptions on future economic growth and wage development.

A2.2.3. Pension projection approach

Pension projections are performed following a year-by-year cohort methodology. The existing population is aged and gradually replaced by the successive cohorts of participants on an annual basis according to the demographic and coverage assumptions. The projection of insurable earnings and benefit expenditures are then performed according to the economic assumptions and the scheme's provisions.

Pensions are long-term benefits. Hence the financial obligations that a society accepts when adopting financing provisions and benefit provisions for them are also of a long-term nature. Participation in a pension scheme extends over the whole adult life, either as contributor or beneficiary, i.e. up to 70 years for someone entering the scheme at the age of 16, retiring at the age of 65 and dying some 20 or so years later. During their working years, contributors gradually build entitlement to pensions that will be paid even after their death, to their survivors. The objective of pension projections is not to forecast the exact development of income and expenditures of the scheme, but to check its financial viability. This entails evaluating the scheme with a view to the relative balance between future revenue and expenditure.

A2.2.4. Calculation of accrued liabilities

The actuarial liability refers to the present value, as of the valuation date, of future payments related to pensions-in-payment and to the accrued rights of the present insured persons. The following approaches are used.

- **Old-age, disability and death insurance**. The actuarial liability refers to the value of pensions accrued at the valuation date. It is assumed that future wage increases will be recognized in the calculation of pensions becoming payable after the valuation date, and that pensions in payment will continue to be indexed. However, it is assumed that no additional insurance credits are granted after the valuation date for calculating benefits (while future service accruals are taken into account for eligibility purposes).

Work injury benefits. The actuarial liability refers to the value of future benefit payments related to accidents that occurred before the valuation date.

▶ Appendix 3. SSC Specific Data and Assumptions

In addition to the demographic and economic assumptions presented in Section 3, the projection of the future financial development of the Social Security Corporation requires a database specific to the scheme (characteristics of insured persons and pensions in payment) and specific actuarial assumptions.

A3.1. Data and assumptions on the insured population

A3.1.1. Number of insured and average wages

Data on the insured population was obtained from the SSC. The database shows a total insured population of 1,736,484 persons who contributed in 2023. They are presented in Table A3.1, by age and gender, and according to the sector to which they belong at the valuation date. It is understood that the employment market is volatile in Jordan and that people may move easily from one sector to another. However, for the purposes of the valuation, and given the limitations of the database and constraints of the actuarial model, it is assumed that insured persons remain in the same sector during their entire participation to the scheme.

Table A3.1 also presents the average earnings of insured persons, classified by age, gender, and sector of activity.

A3.1.2. Salary scales

Table A3.2 present the salary scales used for each sector of activity and gender. This reproduces the theoretical evolution of the salary of an individual throughout his/her entire career, by age, as a result of seniority and promotion. These salary scales are derived from the observed earnings profile of active contributors in 2023, with some smoothing.

For an appropriate treatment of minimum and flat-rate benefits, the actuarial model separates the insured population into three earnings brackets: the lowest 30 per cent, a medium range of 40 per cent and the highest 30 per cent, at each age and for each gender. Separate salary scales are established for each of these earnings brackets.

▶ **Table A3.1. Number and average monthly earnings of active insured persons by age, gender and sector (as at 31 December 2023)**

Age	Private sector				Civil servants				Military				Total			
	Male		Female		Male		Female		Male		Female		Male		Female	
	Number	Average monthly earnings	Number	Average monthly earnings	Number	Average monthly earnings	Number	Average monthly earnings	Number	Average monthly earnings	Number	Average monthly earnings	Number	Average monthly earnings	Number	Average monthly earnings
16–19	24 662	279	4 484	247	891	273	56	273	3 292	327	315	329	28 845	285	4 855	253
20–24	105 402	313	48 815	305	7 975	318	4 597	293	35 611	415	2 632	379	148 988	337	56 044	307
25–29	133 640	412	83 407	390	18 119	430	13 412	420	70 367	504	6 224	459	222 126	443	103 043	398
30–34	122 406	534	70 564	466	25 716	548	18 496	524	69 383	551	6 746	502	217 505	541	95 806	480
35–39	106 590	653	56 495	537	33 441	617	30 553	580	64 202	584	6 714	502	204 233	625	93 762	548
40–44	94 598	775	36 018	671	37 650	653	37 690	645	28 772	591	4 117	473	161 020	714	77 825	648
45–49	77 317	867	23 175	749	36 673	675	28 942	707	5 021	558	1 644	426	119 011	795	53 761	717
50–54	53 700	864	14 801	731	26 481	709	15 230	750	976	464	496	407	81 157	809	30 527	735
55–59	31 161	893	3 787	697	13 298	735	2 325	698	425	446	116	404	44 884	842	6 228	692
60–64	7 295	938	511	704	2 159	873	139	855	71	487	28	454	9 525	920	678	725
65–69	1 158	835	59	880	543	914	43	1 596	5	346	9	0	1 706	858	111	1 086
Total	**757 929**	**596**	**342 116**	**489**	**202 946**	**615**	**151 483**	**609**	**278 125**	**530**	**29 041**	**469**	**1 239 000**	**584**	**522 640**	**523**

▶ **Table A3.2. Salary scales by gender, sector and salary bracket**

Age	Private sector						Civil servants						Military					
	Male			Female			Male			Female			Male			Female		
	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High
17	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
18	0.998	1.055	1.000	1.006	1.019	1.051	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
19	0.997	1.099	1.000	1.012	1.037	1.051	1.011	1.000	1.088	1.000	1.000	1.000	1.160	1.136	1.199	1.050	1.107	1.108
20	0.997	1.135	1.002	1.018	1.056	1.068	1.010	1.226	1.177	1.000	1.000	1.000	1.274	1.233	1.340	1.085	1.184	1.185
21	0.997	1.164	1.052	1.024	1.074	1.096	1.004	1.387	1.265	1.000	1.176	1.252	1.362	1.308	1.450	1.113	1.243	1.245
22	0.998	1.191	1.144	1.029	1.093	1.437	0.998	1.512	1.353	1.000	1.312	1.447	1.434	1.369	1.540	1.135	1.291	1.293
23	1.000	1.216	1.274	1.035	1.112	1.639	0.996	1.614	1.442	1.000	1.423	1.607	1.495	1.420	1.615	1.154	1.332	1.335
24	1.002	1.241	1.435	1.041	1.130	1.819	1.002	1.700	1.530	1.001	1.518	1.742	1.548	1.465	1.681	1.171	1.367	1.370
25	1.004	1.268	1.622	1.047	1.149	1.979	1.016	1.774	1.618	0.999	1.599	1.859	1.594	1.505	1.739	1.185	1.398	1.402
26	1.007	1.297	1.831	1.053	1.167	2.140	1.039	1.840	1.707	0.995	1.671	1.962	1.636	1.540	1.791	1.198	1.426	1.430
27	1.010	1.329	2.057	1.059	1.186	2.431	1.070	1.899	1.795	0.992	1.736	2.054	1.674	1.572	1.837	1.210	1.451	1.455
28	1.014	1.364	2.295	1.065	1.205	2.584	1.110	1.952	1.883	0.992	1.794	2.138	1.708	1.601	1.880	1.221	1.474	1.479
29	1.018	1.403	2.542	1.071	1.223	2.814	1.155	2.001	1.972	0.998	1.847	2.214	1.740	1.628	1.919	1.231	1.496	1.500
30	1.022	1.445	2.795	1.076	1.242	3.059	1.206	2.046	2.060	1.011	1.896	2.284	1.769	1.653	1.956	1.240	1.515	1.520
31	1.027	1.490	3.049	1.082	1.260	3.189	1.258	2.087	2.148	1.034	1.941	2.349	1.796	1.676	1.990	1.248	1.533	1.538
32	1.032	1.538	3.303	1.088	1.279	3.310	1.311	2.125	2.236	1.068	1.983	2.409	1.822	1.698	2.021	1.256	1.551	1.556
33	1.037	1.587	3.552	1.094	1.298	3.377	1.361	2.161	2.325	1.112	2.023	2.466	1.846	1.718	2.051	1.264	1.567	1.572
34	1.042	1.639	3.795	1.100	1.316	3.436	1.407	2.195	2.413	1.167	2.060	2.519	1.868	1.737	2.079	1.271	1.582	1.587
35	1.047	1.691	4.029	1.106	1.335	3.396	1.447	2.227	2.501	1.232	2.095	2.569	1.890	1.756	2.106	1.277	1.596	1.601
36	1.052	1.743	4.254	1.112	1.354	3.779	1.480	2.257	2.590	1.305	2.128	2.616	1.910	1.773	2.131	1.284	1.610	1.615
37	1.058	1.794	4.466	1.118	1.372	4.394	1.505	2.286	2.678	1.383	2.159	2.661	1.929	1.789	2.155	1.290	1.623	1.628
38	1.063	1.844	4.665	1.123	1.391	4.480	1.522	2.313	2.766	1.464	2.189	2.704	1.948	1.805	2.178	1.295	1.635	1.641
39	1.069	1.891	4.851	1.129	1.409	4.563	1.532	2.339	2.855	1.544	2.217	2.744	1.965	1.820	2.200	1.301	1.647	1.652
40	1.074	1.935	5.021	1.135	1.428	4.642	1.536	2.364	2.943	1.619	2.244	2.783	1.982	1.834	2.221	1.306	1.658	1.664
41	1.079	1.975	5.177	1.141	1.447	4.718	1.539	2.388	3.031	1.686	2.270	2.821	1.998	1.848	2.241	1.311	1.669	1.675
42	1.085	2.010	5.317	1.147	1.465	4.791	1.544	2.411	3.120	1.742	2.295	2.856	2.014	1.861	2.260	1.316	1.679	1.685
43	1.090	2.041	5.443	1.153	1.484	4.861	1.558	2.433	3.208	1.785	2.319	2.891	2.029	1.873	2.278	1.321	1.689	1.695

Age	Private sector						Civil servants						Military					
	Male			Female			Male			Female			Male			Female		
	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High
44	1.095	2.067	5.554	1.159	1.502	4.929	1.572	2.454	3.296	1.814	2.342	2.924	2.043	1.886	2.296	1.325	1.699	1.705
45	1.099	2.088	5.652	1.165	1.521	4.994	1.586	2.474	3.385	1.831	2.364	2.956	2.057	1.897	2.314	1.329	1.708	1.714
46	1.104	2.104	5.737	1.170	1.540	5.057	1.600	2.494	3.473	1.837	2.386	2.986	2.070	1.909	2.330	1.333	1.717	1.723
47	1.108	2.115	5.812	1.176	1.558	5.118	1.615	2.513	3.561	1.840	2.407	3.016	2.083	1.920	2.346	1.338	1.726	1.732
48	1.111	2.122	5.877	1.182	1.577	5.177	1.629	2.531	3.650	1.847	2.427	3.045	2.096	1.930	2.362	1.341	1.734	1.741
49	1.115	2.126	5.935	1.188	1.595	5.235	1.643	2.549	3.738	1.873	2.446	3.072	2.108	1.941	2.377	1.345	1.742	1.749
50	1.118	2.128	5.988	1.194	1.614	5.290	1.658	2.566	3.826	1.936	2.465	3.099	2.120	1.951	2.392	1.349	1.750	1.757
51	1.121	2.129	6.039	1.200	1.633	5.344	1.673	2.583	3.915	1.998	2.483	3.126	2.131	1.961	2.406	1.352	1.758	1.765
52	1.123	2.132	6.091	1.206	1.651	5.396	1.688	2.599	4.003	2.060	2.501	3.151	2.142	1.970	2.420	1.356	1.765	1.772
53	1.124	2.139	6.147	1.212	1.670	5.447	1.703	2.614	4.091	2.123	2.518	3.176	2.153	1.979	2.433	1.359	1.773	1.779
54	1.125	2.152	6.210	1.218	1.688	5.497	1.718	2.630	4.180	2.185	2.535	3.200	2.164	1.988	2.446	1.363	1.780	1.787
55	1.126	2.175	6.285	1.223	1.707	5.545	1.733	2.645	4.268	2.247	2.551	3.223	2.174	1.997	2.459	1.366	1.786	1.794
56	1.126	2.211	6.375	1.229	1.726	5.592	1.749	2.659	4.356	2.310	2.567	3.246	2.184	2.005	2.471	1.369	1.793	1.800
57	1.127	2.264	6.484	1.235	1.744	5.638	1.764	2.673	4.444	2.372	2.582	3.268	2.194	2.014	2.484	1.372	1.800	1.807
58	1.128	2.340	6.618	1.241	1.763	5.683	1.780	2.687	4.533	2.434	2.597	3.289	2.203	2.022	2.495	1.375	1.806	1.813
59	1.128	2.442	6.782	1.247	1.781	5.727	1.796	2.701	4.621	2.497	2.612	3.311	2.213	2.030	2.507	1.378	1.812	1.820
60	1.129	2.577	6.980	1.253	1.800	5.770	1.812	2.714	4.709	2.559	2.627	3.331	2.222	2.037	2.518	1.381	1.818	1.826
61	1.129	2.751	7.219	1.259	1.819	5.812	1.828	2.727	4.798	2.621	2.641	3.351	2.231	2.045	2.529	1.383	1.824	1.832
62	1.130	2.971	7.504	1.265	1.837	5.853	1.844	2.739	4.886	2.683	2.654	3.371	2.239	2.052	2.540	1.386	1.830	1.838
63	1.130	3.245	7.842	1.270	1.856	5.893	1.861	2.751	4.974	2.746	2.668	3.390	2.248	2.059	2.551	1.389	1.836	1.843
64	1.131	3.581	8.239	1.276	1.874	5.932	1.877	2.763	5.063	2.808	2.681	3.409	2.256	2.067	2.561	1.391	1.841	1.849
65	1.131	3.988	8.701	1.282	1.893	5.970	1.894	2.775	5.151	2.870	2.694	3.427	2.264	2.073	2.571	1.394	1.847	1.855
66	1.132	4.475	9.236	1.288	1.912	6.008	1.911	2.787	5.239	2.933	2.706	3.446	2.272	2.080	2.581	1.396	1.852	1.860
67	1.132	5.053	9.852	1.294	1.930	6.045	1.928	2.798	5.328	2.995	2.719	3.463	2.280	2.087	2.591	1.399	1.857	1.865
68	1.133	5.733	10.555	1.300	1.949	6.081	1.945	2.809	5.416	3.057	2.731	3.481	2.288	2.093	2.600	1.401	1.863	1.870
69	1.134	6.527	11.355	1.306	1.967	6.116	1.963	2.820	5.504	3.120	2.743	3.498	2.295	2.100	2.610	1.404	1.868	1.875

A3.1.3. Inactive insured persons

The SSC has records on inactive insured persons. However, an important part of these people left Jordan, or are above age 60. Others have already received a lump sum from the scheme and will probably never claim other benefits. Hence, it appears that most of these inactive insured persons do not actually maintain rights under the scheme.

A comparison has been made between the number of emerging pensions projected in the years just following the valuation date (without considering inactive insured persons) with the experience of the scheme over recent years, and it appears that the model would project a reasonable number of new pensioners (considering recent trends) without considering inactive insured persons. In that context, and for the other reasons outlined above, inactive insured persons are not considered in this valuation.

A3.1.4. Projected growth of the insured population

The projection of the insured population is performed following a year-by-year cohort methodology. The existing population is aged and gradually replaced by successive cohorts of participants on an annual basis according to the demographic and coverage assumptions.

In 2023, the SSC covered population[1] represents 70.5 per cent of total employment in the country. Under the baseline scenario of the valuation, it is assumed that the SSC insured population will increase in the future in line with the growth of the total employed population in the country, thus resulting in a global coverage rate of 70.5 per cent constant over time.[2] This assumption is based on the following considerations:

- Over the period 2014-2023, the total SSC insured population has increased in line with total employment in the country.

- In the **private sector**, different forces are at play. A gradual formalisation of employment may be expected in the future. But the present SSC coverage is concentrated in larger enterprises and salaried employment. Extending coverage to small and medium enterprises and to the self-employed comes with challenges. Emerging employment in Jordan might be concentrated in self-employment which is more difficult to attract under social security coverage. It is expected that an eventual modification of the structure of employment in Jordan will be considered in the administrative practices of the SSC and that a gradually increasing proportion of self-employed persons will be attracted into the scheme. With all these considerations, it appears realistic to assume that SSC coverage in the private sector will be aligned with the evolution of total private sector employment in the country.

- According to the commitments of the Jordanian government towards the IMF (Memorandum of Understanding), the **civil service** wage bill should follow the increase of nominal GDP, which translates into civil service employment following total employment in the country (if wages in the public service increase at the same pace as private sector wages).

- For the **military personnel**, SSC coverage concerns only those hired since January 2003, hence it will take some time before the military insured population will reach maturity. The assumption of an increase of military insured persons in line with the general employment growth of the country is consistent with their anticipated participation pattern.

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[1] Persons who paid at least one contribution during the year.

[2] It is supposed that the female coverage rate (SSC female insured divided by female employment) which is higher than 100 per cent in 2023 (because of difference estimation bases for SSC covered people and for the Labour Force Survey) will gradually decrease to 83 per cent in 2080 and 77 per cent in 2100. Hence it is supposed that a portion of new emerging female employment will be informal, as this is already the case for males. Male coverage is then calculated by difference to reach the 70.5 per cent global coverage rate.

The report also presents alternative scenarios based on more optimistic and pessimistic assumptions regarding future coverage. Under the optimistic scenario, the present coverage rate of 70.5 per cent will increase to 80 per cent of total employment in 2070 and will remain at this percentage thereafter. Under the pessimistic scenario, the present coverage rate of 70.5 per cent will decrease to 50 per cent of total employment in 2070 and will remain at this percentage thereafter.

The different coverage scenarios are illustrated in Figure A3.1.

▶ **Figure A3.1. Projection of SSC covered population vs total employment**
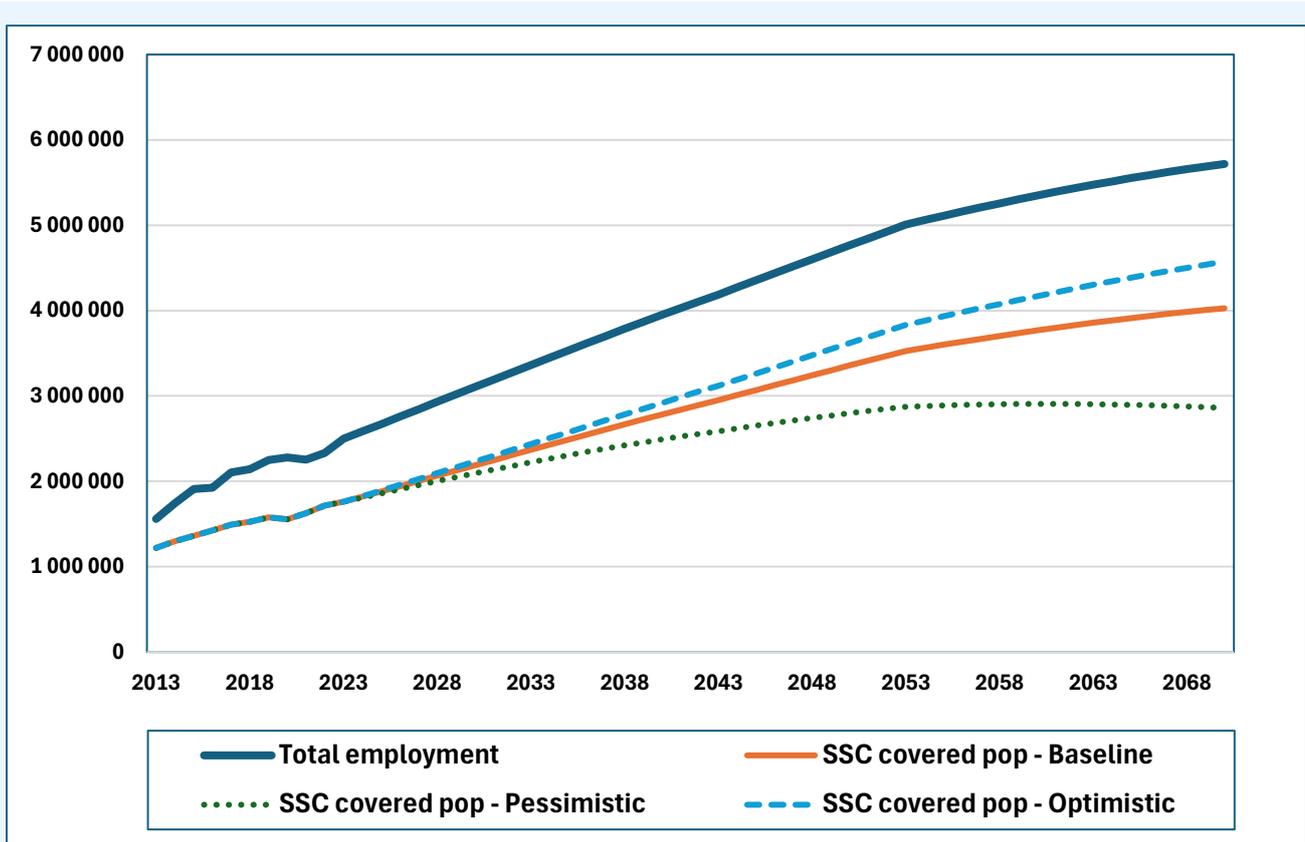
For the application of the year-by-year cohort methodology, an assumption is required on the age and gender distribution of new entrants. The assumed distributions, based on scheme's experience, appear in Table A3.3.

▶ **Table A3.3. Age distribution of new entrants by sector, age and gender**

Age	Private sector		Civil servants		Military	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
17	2.2%	0.2%	0.3%	0.0%	4.4%	0.1%
18	10.6%	2.7%	5.8%	0.3%	15.0%	8.3%
19	12.9%	5.4%	10.2%	0.5%	26.1%	15.9%
20	8.4%	5.3%	7.6%	0.6%	18.3%	9.4%
21	6.3%	5.5%	6.4%	1.1%	10.0%	4.2%
22	7.0%	12.3%	11.8%	12.6%	7.0%	6.4%
23	8.0%	13.9%	12.6%	17.2%	6.0%	11.0%
24	6.7%	9.1%	9.0%	13.3%	4.7%	10.2%

Age	Private sector		Civil servants		Military	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
25	4.4%	7.0%	6.8%	10.1%	3.4%	11.1%
26	3.9%	6.2%	5.3%	7.6%	2.1%	7.3%
27	3.3%	5.1%	4.3%	5.8%	1.3%	4.5%
28	3.1%	4.3%	3.3%	4.5%	0.6%	2.8%
29	2.7%	3.7%	2.5%	3.7%	0.3%	2.2%
30	2.5%	2.8%	1.9%	3.3%	0.1%	1.6%
31	2.3%	2.5%	1.6%	2.8%	0.1%	1.1%
32	2.1%	2.3%	1.3%	2.6%	0.1%	0.9%
33	2.0%	1.9%	1.2%	2.4%	0.1%	0.7%
34	1.9%	1.8%	1.0%	2.3%	0.0%	0.6%
35	1.8%	1.5%	1.0%	2.0%	0.0%	0.5%
36	1.7%	1.6%	1.0%	1.8%	0.0%	0.5%
37	1.6%	1.4%	1.0%	1.6%	0.0%	0.4%
38	1.5%	1.2%	1.1%	1.4%	0.0%	0.3%
39	1.6%	1.1%	1.4%	1.3%	0.1%	0.2%
40	1.5%	1.0%	1.6%	1.2%	0.1%	0.2%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

A3.1.5. Density of contributions

Density of contributions represents the proportion of the year during which the average contributor pays contributions. A density factor of 100 per cent means that the person has paid 12 monthly contributions during a given year. Density factors of 100 per cent are assumed for civil servants and the military personnel, given their employment conditions and the observed data. For the private sector, SSC data allowed to determine density for each specific category of insured (old, current, current-relaxed and new). A transition from crude density data in 2023 to an ultimate level to be reached in 2028 has been done. Resulting density factors appear in Table A3.4.

▶ **Table A3.4. Density factors (ultimate) by sector, age and gender**

Age	Private sector								Civil Servants (both genders)	Military (both genders)
	Male				Female					
	Old	Current	Current Relaxed	New	Old	Current	Current Relaxed	New		
16	-	67.6%	67.6%	63.2%	-	71.7%	71.7%	77.5%	100%	100%
17	-	67.6%	67.6%	63.2%	-	71.7%	71.7%	77.5%	100%	100%
18	-	67.6%	67.6%	63.2%	-	71.7%	71.7%	77.5%	100%	100%
19	-	67.6%	67.6%	63.2%	-	71.7%	71.7%	77.5%	100%	100%
20	-	67.6%	67.6%	63.2%	-	71.7%	71.7%	78.6%	100%	100%
21	-	70.9%	70.9%	67.1%	-	71.7%	71.7%	79.2%	100%	100%
22	-	72.9%	72.9%	69.4%	-	71.7%	71.7%	79.7%	100%	100%

23	-	74.3%	74.3%	71.0%	-	74.3%	74.3%	80.0%	100%	100%
24	-	75.4%	75.4%	72.3%	-	75.8%	75.8%	80.3%	100%	100%
25	-	76.3%	76.3%	73.3%	-	76.9%	76.9%	80.5%	100%	100%
26	-	77.0%	77.0%	74.2%	-	77.7%	77.7%	80.8%	100%	100%
27	-	77.7%	77.7%	74.9%	-	78.4%	78.4%	80.9%	100%	100%
28	-	78.2%	78.2%	75.6%	-	78.9%	78.9%	81.1%	100%	100%
29	-	78.8%	78.8%	76.2%	-	79.4%	79.4%	81.2%	100%	100%
30	-	79.2%	79.2%	76.7%	-	79.9%	79.9%	81.4%	100%	100%
31	-	79.6%	79.6%	77.2%	-	80.3%	80.3%	81.5%	100%	100%
32	-	80.0%	80.0%	77.7%	-	80.6%	80.6%	81.6%	100%	100%
33	-	80.4%	80.4%	78.1%	-	81.0%	81.0%	81.7%	100%	100%
34	-	80.7%	80.7%	78.5%	-	81.3%	81.3%	81.8%	100%	100%
35	-	81.0%	81.0%	78.9%	-	81.5%	81.5%	81.9%	100%	100%
36	-	81.3%	81.3%	79.2%	-	81.8%	81.8%	82.0%	100%	100%
37	-	81.6%	81.6%	79.5%	-	82.0%	82.0%	82.1%	100%	100%
38	-	81.9%	81.9%	79.8%	-	82.3%	82.3%	82.2%	100%	100%
39	-	82.1%	82.1%	80.1%	-	82.5%	82.5%	82.2%	100%	100%
40	-	82.4%	82.4%	80.4%	-	82.7%	82.7%	82.3%	100%	100%
41	-	82.6%	82.6%	80.7%	-	82.9%	82.9%	82.4%	100%	100%
42	-	82.8%	82.8%	80.9%	88.6%	83.0%	83.0%	82.5%	100%	100%
43	-	83.0%	83.0%	81.1%	87.6%	83.2%	83.2%	82.5%	100%	100%
44	93.4%	83.2%	83.2%	81.4%	86.5%	83.4%	83.4%	82.6%	100%	100%
45	91.4%	83.4%	83.4%	81.6%	85.5%	83.5%	83.5%	82.6%	100%	100%
46	90.2%	83.6%	83.6%	81.8%	84.4%	83.7%	83.7%	82.7%	100%	100%
47	89.3%	83.8%	83.8%	82.0%	83.4%	83.8%	83.8%	82.7%	100%	100%
48	88.7%	83.9%	83.9%	82.2%	82.3%	84.0%	84.0%	82.8%	100%	100%
49	88.2%	84.1%	84.1%	82.4%	81.3%	84.1%	84.1%	82.8%	100%	100%
50	87.7%	84.3%	84.3%	82.6%	80.2%	84.2%	84.2%	82.9%	100%	100%
51	87.3%	84.4%	84.4%	82.8%	79.2%	84.4%	84.4%	82.9%	100%	100%
52	87.0%	84.6%	84.6%	82.9%	78.2%	84.5%	84.5%	83.0%	100%	100%
53	86.7%	84.7%	84.7%	83.1%	77.1%	84.6%	84.6%	83.0%	100%	100%
54	86.4%	84.9%	84.9%	83.3%	76.1%	84.7%	84.7%	83.1%	100%	100%
55	86.1%	85.0%	85.0%	83.4%	75.0%	84.8%	84.8%	83.1%	100%	100%
56	85.9%	85.1%	85.1%	83.6%	74.0%	84.9%	84.9%	83.2%	100%	100%
57	85.7%	85.3%	85.3%	83.7%	72.9%	85.0%	85.0%	83.2%	100%	100%
58	85.5%	85.4%	85.4%	83.9%	71.9%	85.2%	85.2%	83.2%	100%	100%
59	85.3%	85.5%	85.5%	84.0%	70.8%	85.3%	85.3%	83.3%	100%	100%

A3.1.6. Separation of the insured population by category

The total population of insured persons at the valuation date was separated into different groups to recognize the specific treatment of the different categories (Old, Current, Current-relaxed and New) of insured persons. This separation was operated using data extracted from the SSC database on past service by category of workers. The population of insured persons as at 31 December 2023 by category is presented in Table A3.5.

▶ **Table A3.5. Insured persons as at 31 December 2023, by category of insured and sector**

Age	PRIVATE SECTOR							
	Male				Female			
	Old	Current	Curr. Rel.	New	Old	Current	Curr. Rel.	New
16–19	0	1	0	24 242	0	0	0	4 474
20–24	0	23 122	0	79 917	0	3 487	0	44 897
25–29	0	83 193	0	48 939	0	34 896	0	47 578
30–34	0	98 705	0	22 644	0	50 761	0	19 550
35–39	0	88 519	0	16 578	0	43 334	0	13 259
40–44	33	78 766	0	14 014	72	30 176	0	5 875
45–49	1 880	64 917	0	8 682	1 144	19 205	0	2 942
50–54	4 071	17 989	25 179	4 719	1 709	5 164	6 636	1 271
55–59	2 655	0	25 185	2 218	309	0	3 193	187
60–64	421	0	6 041	297	8	0	457	0
65–69	9	0	759	2	1	0	35	0
Total	**9 069**	**455 212**	**57 164**	**222 252**	**3 243**	**187 023**	**10 321**	**140 033**

Age	CIVIL SERVANTS							
	Male				Female			
	Old	Current	Curr. Rel.	New	Old	Current	Curr. Rel.	New
16–19	0	0	0	937	0	0	0	57
20–24	0	1 663	0	6 930	0	104	0	4 742
25–29	0	12 739	0	5 933	0	6 086	0	7 603
30–34	0	23 781	0	1 907	0	16 046	0	2 245
35–39	0	32 443	0	650	0	28 458	0	1 728
40–44	48	35 857	0	1 170	43	35 981	0	1 232
45–49	2 347	32 875	0	817	2 691	25 320	0	536
50–54	4 610	8 769	11 831	585	4 547	4 811	5 462	169
55–59	2 443	0	9 937	390	539	0	1 702	14
60–64	337	0	1 434	54	1	0	60	0
65–69	2	0	122	0	0	0	6	0
Total	**9 787**	**148 127**	**23 324**	**19 373**	**7 821**	**116 806**	**7 230**	**18 326**

Age	MILITARY	
	Male	Female
16–19	3 472	316
20–24	36 250	2 735
25–29	68 496	6 428
30–34	67 158	6 701
35–39	62 658	6 556
40–44	28 044	4 029
45–49	4 898	1 616
50–54	971	485
55–59	385	100
60–64	61	10
65–69	4	0
Total	**272 397**	**28 976**

A3.1.7. Past credits accrued at valuation date

A distribution of past credits accrued at valuation date for the active insured population by sector of activity (private, civil servants and military) was obtained from the administrative records of the SSC.

Based on the available data, the past service of the current insured population has been calculated separately for the different sector of activity and category of insured. Data are presented in Table A3.6.

▶ **Table A3.6. Average past contribution years of insured persons as of 31 December 2023 by age, gender, sector of activity and category of insured**

Age	PRIVATE SECTOR							
	Male				Female			
	Old	Current	Curr. Rel.	New	Old	Current	Curr. Rel.	New
20	–	3.1	–	1.2	–	4.0	–	1.2
25	–	3.9	–	1.6	–	3.6	–	1.6
30	–	6.1	–	1.8	–	5.2	–	1.7
35	–	8.9	–	1.7	–	7.7	–	1.8
40	–	11.6	–	1.7	–	10.6	–	1.7
45	27.8	13.7	–	1.9	24.9	12.8	–	1.8
50	29.2	14.2	–	1.9	26.7	13.4	–	1.8
55	30.2	–	13.1	2.0	28.8	–	12.6	1.8
60	31.9	–	14.1	2.1	27.4	–	11.2	–

Age	CIVIL SERVANTS							
	Male				Female			
	Old	Current	Curr. Rel.	New	Old	Current	Curr. Rel.	New
20	–	–	–	1.0	–	–	–	1.0
25	–	4.0	–	1.6	–	2.5	–	1.3
30	–	6.4	–	2.1	–	4.8	–	1.8
35	–	10.8	–	2.1	–	8.4	–	1.7
40	–	14.9	–	1.8	–	12.5	–	1.6
45	28.5	18.1	–	1.9	25.5	16.4	–	1.8
50	29.1	19.2	–	1.9	26.9	18.0	–	1.8
55	29.7	–	17.8	1.8	28.0	–	18.1	2.3
60	30.9	–	18.0	1.6	27.0	–	11.2	–

Age	MILITARY	
	Male	Female
16–19	1.2	1.3
20–24	5.0	3.5
25–29	9.4	7.4
30–34	14.6	12.2
35–39	18.0	15.2
40–44	19.2	16.8
45–49	18.3	17.8
50–54	12.3	16.8
55–59	9.1	13.4
60–64	1.2	1.3
65–69	5.0	3.5
Total	9.4	7.4

A3.2. Demographic assumptions related to the scheme

A3.2.1. Mortality of insured persons

Mortality rates for the insured population are assumed to be equal to the mortality rates of the general population (sample mortality rates for 2024, 2050 and 2100 are presented in Table A3.7). Mortality rates were projected to decline continuously during the projection period in line with the assumed increase of the average life expectancy. This mortality pattern is also used to project survivors' benefits payable at death of insured persons or pensioners. For invalidity pensioners, it is assumed that mortality rates are equal to five times those of the general population at age 20 years, decreasing linearly to two times at age 60.

▶ **Table A3.7. Sample mortality rates, by age and gender (2024, 2050 and 2100)**

Age	Male			Female		
	2024	**2050**	**2100**	**2024**	**2050**	**2100**
0	0.01244	0.00581	0.00218	0.00979	0.00512	0.00237
5	0.00032	0.00016	0.00006	0.00026	0.00015	0.00007
10	0.00021	0.00011	0.00004	0.00015	0.00009	0.00004
15	0.00034	0.00019	0.00007	0.00022	0.00013	0.00006
20	0.00065	0.00038	0.00014	0.00036	0.00023	0.00010
25	0.00066	0.00040	0.00015	0.00046	0.00030	0.00013
30	0.00068	0.00042	0.00016	0.00056	0.00037	0.00016
35	0.00085	0.00053	0.00020	0.00073	0.00049	0.00022
40	0.00124	0.00079	0.00031	0.00102	0.00069	0.00031
45	0.00219	0.00141	0.00055	0.00158	0.00108	0.00048
50	0.00387	0.00249	0.00097	0.00248	0.00167	0.00074
55	0.00685	0.00439	0.00170	0.00382	0.00256	0.00112
60	0.01172	0.00747	0.00285	0.00602	0.00400	0.00170
65	0.01917	0.01224	0.00473	0.01031	0.00685	0.00294
70	0.03243	0.02112	0.00865	0.01896	0.01279	0.00576
75	0.05344	0.03590	0.01554	0.03380	0.02344	0.01107
80	0.08918	0.06293	0.02967	0.06195	0.04490	0.02288
85	0.14763	0.11073	0.05717	0.10681	0.08164	0.04492
90	0.22984	0.18422	0.10525	0.17104	0.13841	0.08266
95	0.32743	0.28049	0.18160	0.25800	0.22158	0.14652
100	0.42544	0.39043	0.29223	0.35609	0.32599	0.24433
105	0.51695	0.47609	0.38423	0.46993	0.42981	0.34216
110	0.62814	0.58055	0.50518	0.62015	0.56671	0.47917
115	0.76326	0.70792	0.66421	0.81840	0.74720	0.67104
120	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Life expectancy at birth	**74.7**	**79.1**	**86.5**	**79.3**	**82.9**	**88.9**
Life expectancy at age 60	**18.9**	**21.9**	**27.8**	**22.5**	**25.1**	**30.0**

A3.2.2. Disability incidence (natural cause)

Invalidity incidence rates are based on the experience of the SSC over the 3-year period 2021-2023. Rates of entry into invalidity are assumed to remain constant for the whole projection period. It is assumed that, among new disability pensioners, 40 percent are partially disabled. Disability incidence rates are shown in Table A3.8.

▶ **Table A3.8. Disability incidence rates by sector, age and gender**

Age	Private sector		Civil servants		Military	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**
20	0.00000	0.00000	0.00000	0.00001	0.00000	0.00000
25	0.00006	0.00000	0.00096	0.00000	0.00021	0.00021
30	0.00012	0.00003	0.00130	0.00013	0.00056	0.00056
35	0.00030	0.00015	0.00324	0.00020	0.00091	0.00091
40	0.00056	0.00043	0.00123	0.00043	0.00058	0.00058
45	0.00086	0.00065	0.00079	0.00053	0.00042	0.00042
50	0.00103	0.00079	0.00118	0.00079	0.00018	0.00018
55	0.00206	0.00092	0.00175	0.00153	0.00000	0.00000
60	0.00218	0.00040	0.00258	0.00601	0.00000	0.00000

A3.2.3. Retirement rates

The statutory retirement age under the law is 60 for males and 55 for females. However, early retirement is possible under certain conditions.

The assumptions concerning the retirement behaviour for civil servants and for the private sector are based on the general retirement pattern assumed for the different participants categories of participants (old, current, current relax, new) in the last actuarial valuation, calibrated on the basis of the experience of 2023 which is considered representative of long-term trends, as opposed to the period 2020-2022 which shows an unusual retirement behaviour due to the Covid-19 pandemic.

Retirement rates for the "New" category are separated between hazardous and non-hazardous jobs, allowing a certain proportion of future entrants in the "New" category to retire before the prescribed early retirement age. The proportion of new entrants in hazardous jobs is assumed to be 29 per cent for males in the private sector, 5 per cent for females in the private sector, 23 per cent for male civilians and 14 per cent for female civilians.[3] For the Military personnel, theoretical retirement rates are assumed until experience develops for this group.

Projected retirement rates appear in Table A3.9. The rates presented in these tables correspond to the percentage of people at a given age that will retire during the following year. For example, a retirement rate applied on insured persons aged 59 generates new retirees at age 60.

▶ **Table A3.9. Retirement rates by sector, gender, age and category of insured**

Private sector - Male					
Age	Old	Current	Current (relaxed conditions)	New	
				Non-hazardous	Hazardous
44	5%	1%	2%	0%	1%
45	5%	1%	1%	0%	1%
46	5%	1%	1%	0%	1%

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[3] Since the retirement conditions applicable to hazardous jobs are not materially different from those applicable to the "Current" category, the retirement rates of the "Current" category do not need to be adjusted for hazardous jobs.

47	5%	2%	2%	0%	2%
48	5%	2%	2%	0%	2%
49	5%	12%	2%	0%	12%
50	5%	5%	5%	0%	5%
51	5%	5%	5%	0%	5%
52	5%	5%	5%	0%	5%
53	5%	5%	5%	0%	5%
54	5%	5%	5%	5%	5%
55	5%	5%	5%	5%	5%
56	5%	5%	5%	5%	5%
57	5%	5%	5%	5%	5%
58	5%	5%	5%	5%	5%
59	62%	62%	62%	62%	62%
60	18%	18%	18%	18%	18%
61	18%	18%	18%	18%	18%
62	17%	17%	17%	17%	17%
63	19%	19%	19%	19%	19%
64	28%	28%	28%	28%	28%
65	24%	24%	24%	24%	24%
66	25%	25%	25%	25%	25%
67	26%	26%	26%	26%	26%
68	33%	33%	33%	33%	33%
69	100%	100%	100%	100%	100%

Private sector – Female					
Age	**Old**	**Current**	**Current (relaxed conditions)**	**New**	
				Non-hazardous	**Hazardous**
44	10%	1%	4%	0%	1%
45	4%	1%	2%	0%	1%
46	3%	1%	2%	0%	1%
47	5%	2%	3%	0%	2%
48	4%	2%	2%	0%	2%
49	5%	22%	3%	0%	22%
50	6%	6%	6%	0%	6%
51	5%	5%	5%	5%	5%
52	5%	5%	5%	5%	5%
53	4%	4%	4%	4%	4%

54	40%	40%	40%	40%	40%
55	12%	12%	12%	12%	12%
56	12%	12%	12%	12%	12%
57	11%	11%	11%	11%	11%
58	15%	15%	15%	15%	15%
59	19%	19%	19%	19%	19%
60	20%	20%	20%	20%	20%
61	20%	20%	20%	20%	20%
62	20%	20%	20%	20%	20%
63	20%	20%	20%	20%	20%
64	20%	20%	20%	20%	20%
65	100%	100%	100%	100%	100%
66	100%	100%	100%	100%	100%
67	100%	100%	100%	100%	100%
68	100%	100%	100%	100%	100%
69	100%	100%	100%	100%	100%

Civil servants – Male					
Age	**Old**	**Current**	**Current (relaxed conditions)**	**New**	
				Non-hazardous	**Hazardous**
44	6%	1%	1%	0%	1%
45	6%	1%	1%	0%	1%
46	6%	1%	1%	0%	1%
47	6%	3%	3%	0%	3%
48	6%	3%	3%	0%	3%
49	6%	9%	3%	0%	9%
50	6%	6%	6%	0%	6%
51	6%	6%	6%	0%	6%
52	6%	6%	6%	0%	6%
53	6%	6%	6%	0%	6%
54	6%	6%	6%	6%	6%
55	6%	6%	6%	6%	6%
56	6%	6%	6%	6%	6%
57	6%	6%	6%	6%	6%
58	6%	6%	6%	6%	6%
59	90%	90%	90%	90%	90%
60	25%	25%	25%	25%	25%

61	20%	20%	20%	20%	20%
62	28%	28%	28%	28%	28%
63	20%	20%	20%	20%	20%
64	55%	55%	55%	55%	55%
65	33%	33%	33%	33%	33%
66	23%	23%	23%	23%	23%
67	19%	19%	19%	19%	19%
68	4%	4%	4%	4%	4%
69	100%	100%	100%	100%	100%

Civil servants – Female					
Age	Old	Current	Current (relaxed conditions)	New	
				Non-hazardous	Hazardous
44	4%	1%	2%	0%	1%
45	3%	1%	2%	0%	1%
46	2%	1%	1%	0%	1%
47	3%	1%	1%	0%	1%
48	3%	1%	2%	0%	1%
49	3%	11%	2%	0%	11%
50	4%	4%	4%	0%	4%
51	3%	3%	3%	3%	3%
52	3%	3%	3%	3%	3%
53	4%	4%	4%	4%	4%
54	62%	62%	62%	62%	62%
55	10%	10%	10%	10%	10%
56	10%	10%	10%	10%	10%
57	9%	9%	9%	9%	9%
58	14%	14%	14%	14%	14%
59	41%	41%	41%	41%	41%
60	16%	16%	16%	16%	16%
61	16%	16%	16%	16%	16%
62	16%	16%	16%	16%	16%
63	16%	16%	16%	16%	16%
64	16%	16%	16%	16%	16%
65	100%	100%	100%	100%	100%
66	100%	100%	100%	100%	100%
67	100%	100%	100%	100%	100%

68	100%	100%	100%	100%	100%
69	100%	100%	100%	100%	100%

Military		
Age	**Male**	**Female**
44	75%	75%
45	5%	5%
46	5%	5%
47	5%	5%
48	5%	5%
49	5%	5%
50	5%	7%
51	5%	7%
52	5%	7%
53	5%	7%
54	5%	7%
55	5%	7%
56	5%	7%
57	5%	7%
58	5%	40%
59	5%	100%
60	5%	100%
61	5%	100%
62	5%	100%
63	40%	100%
64	100%	100%

A3.2.4. Family statistics

Family statistics are necessary for the projection of survivors' benefits. Assumptions must be established on the probability of having an eligible spouse at death, the average age of the spouse, the average number of children (and other survivors) possibly eligible for a benefit and the average age of the children (and other survivors). It is also necessary to determine survival rates for children and other beneficiaries.

Concerning the probability to have a spouse at death and the average age of orphans and other beneficiaries, no recent data were available, hence the same probabilities as those used for the last valuation were used. The same for the average number of children and the survival function of orphans. Factors used for the projection of survivors' benefits are shown in Table A3.10.

It is assumed here that children have a 100 per cent probability to reach the age of 18 in the status of beneficiary, that 50 per cent of children leave school at age 19 and that pension will terminate for 95 per cent of children remaining at age 26. For the 5 percent of children continuing to receive a pension after age 26, and

for the other types of survivors (sister, brother, parents), decrement rates are set equal to the mortality rates of the general population.

For dependents' supplement granted to new pensioners, it is assumed that new pensioners at age 45 have three dependents and that this number of dependents gradually decreases to two dependents for pensions starting at the normal retirement age.

▶ **Table A3.10. Family statistics**

Age	Male				Female			
	Probability of having an eligible spouse	Average age of spouse	Average number of other survivors	Average age of other survivors	Probability of having an eligible spouse	Average age of spouse	Average number of other survivors	Average age of other survivors
20	13%	18	0.1	1	0%	22	0.1	1
25	39%	22	0.8	1	0%	28	0.5	1
30	62%	26	1.6	3	0%	34	0.9	3
35	81%	31	2.3	6	0%	40	1.2	6
40	88%	35	2.8	8	1%	46	1.4	10
45	88%	39	3.1	11	3%	51	1.5	14
50	88%	44	3.2	14	4%	57	1.4	17
55	88%	48	3.1	17	5%	63	1.3	21
60	88%	52	2.8	19	5%	69	1.1	25
65	88%	57	2.4	22	5%	75	0.8	32
70	88%	61	1.8	25	4%	80	0.5	38
75	88%	65	1.2	27	3%	85	0.2	45
80	85%	70	0.6	30	2%	90	–	52
85	85%	75	0.1	35	0%	95	–	57
90	85%	80	–	40	0%	95	–	62
95	85%	85	–	45	0%	95	–	67

A3.3. Assumptions related to Work injury benefits

Incidence of work-related disability. Incidence of disability due to work injury has been determined separately for injured workers eligible for a pension with a degree of disablement of 30 percent or more and for those receiving a lump sum for the compensation of a permanent disability of less than 30 per cent (see Table A3.11). For determining incidence rates for disablements below 30 per cent, the 2016 age pattern is applied to the average number of cases of 2023. For disablements of 30 per cent and above, the full experience of the period 1995-2023 is used. Incidence rates for women are capped for ages 45 and above to avoid distortions at higher ages due to low exposures.

▶ **Table A3.11. Disability incidence related to work (per 100,000)**

Age	Disablement less than 30%		Disablement 30% and above	
	Male	**Female**	**Male**	**Female**
20	159	96	16	2
25	179	66	18	2
30	233	27	21	3
35	285	20	24	4
40	311	54	25	4
45	297	101	25	3
50	243	101	25	3
55	161	101	25	3
60	73	101	27	3

Degree of disablement. Amounts of pensions and lump sums are proportional to the degree of disablement. Based on the experience of the period 2003-2013 (no experience available beyond that point), the assumed average degree of disablement for cases with disablement of at least 30 per cent varies by age as shown in Table A3.12. The average degree of disablement for cases with less than 30 per cent of disablement is assumed to be 6 percent, based on experience data.

▶ **Table A3.12. Average degree of work-related disablement (for both genders)**

Age	Degree of disability
20	61%
25	54%
30	48%
35	42%
40	38%
45	35%

For the determination of work-related <u>death benefits</u>, the percentage of deaths due to work is assumed to be equal to 6 percent of the number of deaths due to all causes, based on scheme's experience.

Medical expenses and injury allowances. Medical expenses and injury allowances are monitored by year of occurrence of work-related injuries and diseases (injury year) and by the year in which the payment is made (payment year). The projection of medical expenses and injury allowances is done separately for work-related injuries and diseases that have occurred <u>before</u> the valuation date and those that occur <u>after</u> the valuation date.

  – The projected medical expenses and injury allowances for work-related injuries and diseases that have occurred before the valuation date are based on the reference payments and the development factors shown in Table A3.13. The reference payments are deemed to be payments made in 2023 for medical expenses and injury allowances that occurred in 2023 and before. Development factors express the pattern of payments over time for work-related injuries and diseases that occur during a given year. The estimation of reference payments and development factors is based on experience. The projection assumes that future medical expenses will follow the long-term inflation assumption, with a minimum of 3 per cent per year.

- For work-related injuries and diseases that will occur after the valuation date, the projection starts by considering work-related injuries and diseases that occur in the first projection year (2024) and the related medical expenses and injury allowances. These medical expenses and injury allowances are estimated by averaging adjusted payments for work-related injuries and diseases that occurred in the years 2018 to 2023 (weights are applied to the different years of experience to consider the increase of expenditures observed in recent years). The estimated medical expenses and injury allowances for work-related injuries and diseases that occur in 2024 are shown in the last two columns of Table A3.13. For projection years 2025 and thereafter:

  o Medical expenses are obtained by adjusting those of year 2024 for inflation and growth in covered population.

  o Injury allowances are obtained by adjusting those of year 2024 for inflation, growth of average earnings and growth of the insured population.

▶ **Table A3.13. Projection bases for work-related medical expenses and injury allowances**

Payment year minus injury year	Reference payments (payment year 2023)		Development factors		Estimated payments (injury year 2024)	
	Medical expenses	**Injury allowance**	**Medical expenses**	**Injury allowance**	**Medical expenses**	**Injury allowance**
0	2 582 441	1 177 399	1.6896	1.8394	2 772 326	1 224 772
1	4 906 461	2 457 131	0.4043	0.3921	4 506 479	2 091 924
2	1 195 489	585 845	0.3906	0.3502	1 866 521	863 382
3	272 996	127 633	0.4927	0.5587	780 087	321 454
4	96 102	124 551	0.4808	0.2623	395 757	181 820
5	57 916	27 805	0.3659	0.6714	191 440	49 661
6	30 148	19 175	1.0482	0.6107	72 460	33 879
7	72 093	16 575	0.4948	0.3299	77 851	21 207
8	43 090	3 529	0.5761	0.5029	39 484	7 171

Average contribution rate of the WI branch. For Work injury benefits, the employer's contribution rate may be reduced to 1.0 percent of earnings (instead of 2.0 percent) if the employer assumes separately the cost of temporary disability benefits (daily allowances and medical expenses). For this actuarial review, employers are assumed to contribute at an average rate of 1.6 per cent of earnings for Work injury benefits, to account for that provision.

A3.4.   Other assumptions

A3.4.1. Future adjustment of earnings thresholds

It is assumed that the 1,500 JD threshold is not indexed during the projection period, but that the maximum insurable earnings of 3,000 JD is indexed with inflation.

A3.4.2. Indexing of certain scheme's parameters

It is assumed that the following amounts will not change in the future:

The fixed supplements of JOD20 before normal retirement age and JOD40 from normal retirement age;

The minimum and maximum dependent's supplement; and

The minimum of JOD30 and maximum of JOD50 applicable to the 10 per cent pension increase granted to the OLD category.

The minimum pension is assumed to be indexed annually in line with the general wage increase, and the funeral grant to be indexed annually in line with the inflation rate.

A3.4.3. Indexation of pensions in payment

It is assumed that pensions will be indexed in the future in line with price inflation.

It is further assumed that the proportion of pensions affected by the limit on the indexation amount (JOD20 indexed with inflation) will remain stable in the future. For the scheme to maintain its relevance and continuously comply with ILO Convention 102, the indexation limit will have to account for the fact that new emerging pensions will evolve in the future in line with the evolution of wages (which generally increase faster than inflation), hence this is equivalent to assuming that the indexation limit will be adjusted with a wage index in the future.

A3.4.3. Administrative expenses

Administrative expenses are determined as the amount paid in 2023 increasing annually in line with the average of (1) the general wage growth and (2) the inflation rate. Administrative expenses for 2023 are distributed by benefit branches in proportion of the sum of contribution income and benefit expenditure of each branch.

A3.5.   Pensions in payment in December 2023

This section presents a distribution of pensions in payment at the valuation, by age and gender.

A3.5.1. Old-age, disability and death insurance

▶ **Table A3.14. Old-age pensions (normal and early retirement)**

Age	PRIVATE SECTOR					
	Male			**Female**		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
45–49	3 954	514	144	1 109	456	88
50–54	16 842	560	157	6 196	394	76
55–59	20 762	562	157	9 281	377	62
60–64	26 120	521	139	6 029	397	89
65–69	18 701	535	159	3 027	347	135
70–74	10 027	460	201	1 309	256	167
75–79	5 830	367	223	717	161	179
80–84	3 267	258	221	322	108	182
85–89	1 184	150	207	129	74	185
90–94	239	102	197	20	54	172
95–99	37	72	174	2	50	198

Total	**106 963**	**510**	**163**	**28 141**	**369**	**90**

	CIVIL SERVANTS					
Age	**Male**			**Female**		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
45–49	1 665	275	105	531	278	34
50–54	7 648	296	113	3 831	278	34
55–59	10 073	295	112	7 721	307	46
60–64	12 777	318	114	3 861	282	80
65–69	8 445	326	135	1 867	223	138
70–74	4 995	267	168	876	163	168
75–79	3 113	227	193	591	126	179
80–84	1 957	162	193	351	73	187
85–89	876	91	199	118	52	188
90–94	265	60	198	31	51	190
95–99	30	50	169	5	51	150
Total	**51 844**	**289**	**131**	**19 783**	**270**	**71**

	MILITARY					
Age	**Male**			**Female**		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
45–49	603	159	112	57	126	39
50–54	776	179	126	323	126	39
55–59	545	114	80	314	138	51
60–64	454	144	99	247	134	103
65–69	288	157	116	118	124	148
70–74	170	149	147	80	86	166
75–79	120	118	173	30	57	194
80–84	111	77	195	26	51	200
85–89	67	56	208	9	50	198
90–94	33	47	199	4	69	172
95–99	7	50	208	0	0	0
Total	**3 174**	**146**	**119**	**1 208**	**124**	**83**

▶ **Table A3.15. Disability pensions (natural causes)**

Age	PRIVATE SECTOR					
	Male			Female		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
15–19	0	0	0	0	0	0
20–24	1	63	43	0	0	0
25–29	26	132	42	2	80	0
30–34	110	164	53	16	170	59
35–39	227	186	70	55	172	60
40–44	360	204	79	110	213	77
45–49	515	214	92	160	204	93
50–54	693	193	104	227	182	113
55–59	858	189	109	181	177	119
60–64	784	199	130	132	160	154
65–69	601	199	156	65	119	180
70–74	380	185	180	56	156	184
75–79	293	190	190	42	124	189
80–84	268	196	193	28	114	180
85–89	177	194	190	10	105	167
90–94	55	150	176	2	78	186
95–99	12	104	165	0	0	0
Total	**4 636**	**195**	**136**	**903**	**170**	**132**

Age	CIVIL SERVANTS					
	Male			Female		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
15–19	0	0	0	0	0	0
20–24	0	0	0	0	0	0
25–29	1	224	50	0	0	0
30–34	11	166	60	1	221	7
35–39	56	158	64	24	219	66
40–44	119	175	80	78	202	77
45–49	232	162	103	125	209	97
50–54	354	151	118	137	182	101

Age	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
55–59	384	130	138	126	141	143
60–64	349	110	164	123	114	172
65–69	293	125	173	90	85	190
70–74	200	119	180	88	77	203
75–79	149	144	191	83	88	197
80–84	143	133	191	35	74	186
85–89	77	96	186	19	57	201
90–94	17	67	202	0	0	0
95–99	3	105	123	0	0	0
Total	**2 201**	**131**	**153**	**826**	**131**	**153**

	MILITARY					
	Male			Female		
Age	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
15–19	0	0	0	0	0	0
20–24	0	0	0	0	0	0
25–29	2	244	48	0	0	0
30–34	142	222	67	5	298	103
35–39	668	211	75	22	228	84
40–44	593	204	77	19	249	90
45–49	149	196	94	12	185	97
50–54	47	138	113	12	172	81
55–59	22	144	131	15	110	116
60–64	33	114	154	16	62	207
65–69	10	73	196	12	61	207
70–74	4	83	186	18	60	197
75–79	4	98	178	8	58	202
80–84	7	75	192	7	58	204
85–89	7	107	190	0	0	0
90–94	1	125	139	0	0	0
95–99	0	0	0	0	0	0
Total	**284**	**160**	**118**	**100**	**96**	**162**

▶ **Table A3.16. Widow(er)s pensions – Deaths from natural causes (according to the deceased's gender)**

	PRIVATE SECTOR					
	Male			Female		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
15–19	1	83	22	0	0	0
20–24	22	110	26	0	0	0
25–29	117	108	24	0	0	0
30–34	318	127	27	0	0	0
35–39	654	140	31	0	0	0
40–44	1 279	139	33	0	0	0
45–49	2 051	155	36	0	0	0
50–54	3 392	162	38	2	116	27
55–59	4 676	166	42	2	68	16
60–64	5 305	188	48	2	100	47
65–69	4 540	181	55	5	141	61
70–74	3 644	169	63	4	141	48
75–79	3 009	155	66	7	107	59
80–84	1 982	131	67	8	106	52
85–89	845	113	63	3	191	54
90–94	249	103	61	3	112	77
95–99	29	94	55	0	0	0
Total	**29 722**	**166**	**52**	**36**	**121**	**53**

	CIVIL SERVANTS					
	Male			Female		
Age	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
15–19	1	75	51	0	0	0
20–24	9	105	30	0	0	0
25–29	60	92	25	0	0	0
30–34	186	109	28	0	0	0
35–39	472	102	30	0	0	0
40–44	927	113	34	0	0	0
45–49	1 428	113	35	0	0	0
50–54	2 480	113	38	1	87	35

55–59	3 295	115	42	3	123	42
60–64	3 642	118	46	1	69	50
65–69	3 528	117	52	3	195	41
70–74	2 818	109	57	8	118	57
75–79	2 480	105	59	6	118	69
80–84	1 654	95	59	12	81	51
85–89	973	87	58	4	88	40
90–94	313	86	58	3	174	62
95–99	73	86	61	0	0	0
Total	**22 684**	**111**	**49**	**41**	**112**	**53**

	MILITARY					
	Male			**Female**		
Age	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
15–19	0	0	0	0	0	0
20–24	7	119	20	0	0	0
25–29	40	110	22	0	0	0
30–34	71	106	25	0	0	0
35–39	89	94	25	0	0	0
40–44	82	93	28	0	0	0
45–49	79	89	31	0	0	0
50–54	113	88	33	0	0	0
55–59	152	87	41	2	128	44
60–64	160	89	46	0	0	0
65–69	163	90	52	0	0	0
70–74	170	88	55	0	0	0
75–79	205	87	58	0	0	0
80–84	136	85	57	0	0	0
85–89	97	88	60	0	0	0
90–94	33	81	53	0	0	0
95–99	10	97	68	0	0	0
Total	**1 318**	**88**	**50**	**2**	**128**	**44**

▶ **Table A3.17. Pensions to orphans and other survivors – Death from natural causes**

	PRIVATE SECTOR					
	Male			Female		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
0–4	216	55	13	237	63	13
5–9	1 094	56	12	1 079	60	13
10–14	2 462	58	12	2 258	53	12
15–19	4 369	57	13	4 232	53	12
20–24	4 454	68	15	5 044	63	14
25–29	144	112	30	3 256	74	16
30–34	125	72	23	2 078	82	21
35–39	140	85	29	1 818	84	26
40–44	137	87	32	1 759	77	29
45–49	127	62	33	1 704	80	34
50–54	111	79	31	1 846	72	36
55–59	130	60	20	1 743	69	36
60–64	229	52	13	1 329	67	32
65–69	285	55	13	948	67	26
70–74	342	56	12	866	68	19
75–79	468	58	13	952	69	16
80–84	503	54	12	967	83	17
85–89	324	52	13	716	73	16
90–94	119	79	15	356	83	17
95–99	59	121	19	146	81	18
Total	**2 697**	**59**	**15**	**11 573**	**73**	**28**

Age	CIVIL SERVANTS					
	Male			Female		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
0–4	169	50	13	182	51	13
5–9	830	47	12	876	45	12
10–14	2 119	43	12	2 030	42	12
15–19	3 577	43	13	3 462	41	12
20–24	3 357	47	14	3 560	44	14
25–29	101	119	39	2 488	48	16
30–34	109	55	26	1 692	48	20
35–39	142	56	29	1 579	50	24
40–44	123	53	31	1 635	54	29
45–49	122	63	37	1 761	56	33
50–54	72	60	37	1 915	57	35
55–59	67	51	25	1 766	59	37
60–64	126	51	17	1 229	59	34
65–69	202	48	11	952	59	28
70–74	278	46	12	822	57	22
75–79	328	46	13	817	54	18
80–84	375	47	14	705	59	17
85–89	203	47	14	533	56	17
90–94	94	41	11	241	51	17
95–99	22	86	30	86	68	20
Total	**1 889**	**49**	**16**	**10 827**	**57**	**29**

Age	MILITARY					
	Male			Female		
	Number	Average monthly basic pension	Average monthly supplements	Number	Average monthly basic pension	Average monthly supplements
0–4	34	58	13	36	71	14
5–9	166	60	14	141	58	13
10–14	189	51	14	205	47	14
15–19	220	41	13	205	37	12
20–24	145	36	14	173	30	12
25–29	3	67	40	101	33	14
30–34	9	35	22	77	33	17

35–39	8	50	33	100	37	22
40–44	8	58	38	113	46	30
45–49	15	62	33	154	50	30
50–54	27	63	15	222	55	30
55–59	57	52	12	278	52	28
60–64	74	42	11	206	50	22
65–69	97	40	10	174	50	21
70–74	83	43	11	113	56	20
75–79	54	41	11	83	46	15
80–84	42	51	14	36	47	16
85–89	14	64	19	23	47	16
90–94	6	46	15	14	38	20
95–99	1	57	8	5	50	25
Total	**470**	**46**	**13**	**1 308**	**51**	**24**

A3.5.2. Employment injury

▶ **Table A3.18. Disability pensions (work-related)**

Age	Male		Female	
	Number	Average monthly pension	Number	Average monthly pension
15-19				
20–24				
25–29				
30–34				
35–39				
40–44				
45–49				
50–54				
55–59				
60–64				
65–69				
70–74				
75–79				
80–84				
85–89				
90–94				
Total				

▶ **Table A3.19. Widow(er)s pensions – Work-related deaths (according to the deceased's gender)**

Age	From males (widows)		From female (widowers)	
	Number	Average monthly pension	Number	Average monthly pension
15–19				
20–24				
25–29				
30–34				
35–39				
40–44				
45–49				
50–54				
55–59				
60–64				
65–69				
70–74				
75–79				
80–84				
85–89				
90–94				
95–99				
Total				

▶ **Table A3.20. Pensions to orphans and other survivors – Work-related death (according to the deceased's gender)**

Age	From males (widows)		From female (widowers)	
	Number	Average monthly pension	Number	Average monthly pension
0–4				
5–9				
10–14				
15–19				
20–24				
25–29				
30–34				
35–39				
40–44				
45–49				

50–54				
55–59				
60–64				
65–69				
70–74				
75–79				
80–84				
85–89				
90–94				
95–99				
Total				

▶ Appendix 4. Detailed financial projections

This annex presents detailed financial projections of: OADDI and Work injury branches under base scenario, separately for each sector of activity (private sector, civil servants and military personnel).

▶ Table A4.1.Projected revenues, expenditures and reserve, 2020–2100, Base scenario, OADDI branch, Private sector (million JOD)

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	1 116	446	1 562	1 217	22	1 238	9 027	7,3	19,4
2025	1 168	463	1 632	1 271	22	1 293	9 366	7,2	19,4
2026	1 220	484	1 704	1 334	23	1 357	9 713	7,2	19,5
2027	1 271	502	1 773	1 405	23	1 429	10 058	7,0	19,7
2028	1 326	519	1 845	1 493	24	1 517	10 387	6,8	20,0
2029	1 403	536	1 938	1 589	24	1 614	10 712	6,6	20,1
2030	1 485	550	2 035	1 696	25	1 720	11 026	6,4	20,3
2035	2 004	605	2 608	2 391	28	2 420	12 259	5,1	21,1
2040	2 782	609	3 391	3 433	32	3 465	12 480	3,6	21,8
2045	3 783	520	4 304	5 104	37	5 141	10 302	2,0	23,8
2050	4 830	102	4 932	7 702	42	7 744	682	0,1	28,1
2060	7 473	-2 985	4 488	16 778	56	16 833	-71 949	-4,3	39,4
2070	11 213	-12 793	-1 580	32 046	74	32 121	-301 730	-9,4	50,1
2080	16 509	-35 132	-18 623	54 488	100	54 588	-835 256	-15,3	57,9
2090	23 820	-81 588	-57 768	87 704	136	87 840	-1 932 669	-22,0	64,5
2100	33 767	-168 013	-134 246	134 794	185	134 979	-4 015 652	-29,8	70,0

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ **Table A4.2. Projected revenues, expenditures and reserve, 2020–2100, Base scenario, OADDI branch, Civil servants (million JOD)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	449	227	675	459	11	470	4 616	9,8	18,3
2025	477	238	715	504	11	515	4 816	9,4	18,9
2026	509	249	758	557	11	569	5 005	8,8	19,6
2027	543	259	801	617	12	628	5 178	8,2	20,3
2028	579	267	846	692	12	704	5 320	7,6	21,3
2029	606	273	879	775	12	787	5 412	6,9	22,7
2030	635	275	909	867	13	879	5 442	6,2	24,2
2035	808	224	1 032	1 455	14	1 470	4 283	2,9	31,8
2040	1 066	36	1 102	2 181	16	2 197	174	0,1	36,1
2045	1 430	-318	1 112	2 951	19	2 970	-7 522	-2,5	36,4
2050	1 859	-871	988	3 764	21	3 785	-19 562	-5,2	35,6
2060	2 936	-2 749	187	6 479	28	6 507	-63 698	-9,8	38,8
2070	4 298	-7 371	-3 073	12 393	38	12 431	-171 878	-13,8	50,6
2080	6 249	-17 322	-11 073	20 830	51	20 881	-409 741	-19,6	58,5
2090	9 095	-37 052	-27 957	32 653	69	32 722	-874 938	-26,7	63,0
2100	12 935	-72 420	-59 485	49 628	94	49 721	-1 727 444	-34,7	67,3

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ **Table A4.3. Projected revenues, expenditures and reserve, 2020–2100, Base scenario, OADDI branch, Military (million JOD)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	451	102	553	34	4	39	2 293	59,5	1,9
2025	480	129	609	49	5	53	2 849	53,3	2,5
2026	510	160	670	69	5	74	3 444	46,5	3,3
2027	542	191	732	98	5	103	4 074	39,5	4,3
2028	575	223	798	136	5	141	4 731	33,6	5,5
2029	603	257	859	186	5	191	5 399	28,2	7,1
2030	631	290	921	246	5	251	6 069	24,2	8,9
2035	794	447	1 241	606	6	612	9 323	15,2	17,3
2040	998	577	1 575	1 076	7	1 082	12 112	11,2	24,4
2045	1 262	668	1 930	1 613	8	1 620	13 947	8,6	28,9
2050	1 609	718	2 326	2 197	9	2 205	15 007	6,8	30,8
2060	2 446	431	2 877	4 382	11	4 394	8 709	2,0	40,4
2070	3 663	-967	2 697	7 711	15	7 726	-24 058	-3,1	47,5
2080	5 360	-4 485	875	12 755	20	12 775	-107 934	-8,4	53,6
2090	7 711	-12 300	-4 589	20 431	28	20 459	-292 925	-14,3	59,7
2100	10 992	-27 509	-16 517	31 492	38	31 530	-659 494	-20,9	64,5

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ Table A4.4. Projected revenues, expenditures and reserve, 2020–2100, Base scenario, Work injury branch, Private sector (million JOD)

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	107	14	121	29	2	31	314	10,2	0,4
2025	113	18	131	30	2	32	413	12,9	0,4
2026	119	24	142	32	2	34	521	15,5	0,4
2027	125	29	154	33	2	35	640	18,0	0,4
2028	131	36	166	35	2	37	769	20,6	0,4
2029	139	43	182	37	2	39	911	23,2	0,4
2030	148	50	198	39	2	41	1 068	25,8	0,4
2035	205	99	303	51	3	53	2 115	39,7	0,4
2040	288	174	462	66	3	68	3 772	55,1	0,4
2045	393	292	685	85	3	88	6 339	72,0	0,3
2050	502	462	964	108	4	112	10 059	90,2	0,3
2060	775	976	1 751	165	5	171	22 262	130,6	0,3
2070	1 162	1 935	3 097	241	7	248	44 492	179,4	0,3
2080	1 708	3 563	5 272	342	9	351	83 439	237,4	0,3
2090	2 464	6 417	8 881	477	12	489	150 458	307,7	0,3
2100	3 493	11 065	14 558	654	17	670	262 498	391,5	0,3

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶   **Table A4.5. Projected revenues, expenditures and reserve, 2020–2100, Base scenario, Work injury branch, Civil servants (million JOD)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	41	4	45	8	0	8	92	11,1	0,3
2025	43	6	49	8	1	9	133	15,2	0,3
2026	45	8	53	9	1	9	177	19,3	0,3
2027	48	10	58	9	1	10	225	23,4	0,3
2028	50	13	62	10	1	10	277	27,5	0,3
2029	52	16	67	10	1	11	334	31,7	0,3
2030	54	18	73	10	1	11	396	35,9	0,3
2035	69	37	106	13	1	14	793	58,6	0,3
2040	91	64	156	16	1	16	1 389	85,4	0,3
2045	123	105	228	19	1	20	2 284	116,1	0,2
2050	159	165	324	23	1	24	3 589	148,8	0,2
2060	252	347	599	35	1	36	7 925	218,3	0,2
2070	368	687	1 055	51	2	53	15 793	300,8	0,2
2080	536	1 257	1 793	71	2	74	29 429	399,7	0,2
2090	780	2 254	3 033	100	3	103	52 833	514,2	0,2
2100	1 109	3 876	4 984	137	4	141	91 937	650,4	0,2

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ **Table A4.6. Projected revenues, expenditures and reserve, 2020–2100, Base scenario, Work injury branch, Military (million JOD)**

Year	Revenues			Expenditures			Reserve		PAYG cost rate (%)
	Contribution income	Investment income	Total	Benefits	Administrative expenses	Total	Amount (year-end)	Reserve ratio[1]	
2024	31	5	36	9	1	10	112	11,8	0,5
2025	33	6	39	9	1	10	141	14,3	0,5
2026	34	8	42	9	1	10	173	16,9	0,4
2027	36	10	46	10	1	11	209	19,4	0,4
2028	38	12	50	10	1	11	247	22,0	0,4
2029	40	14	54	11	1	12	289	24,7	0,4
2030	42	16	58	11	1	12	335	27,4	0,4
2035	53	29	82	14	1	15	626	42,1	0,4
2040	67	49	115	17	1	18	1 049	59,1	0,4
2045	84	77	161	20	1	21	1 656	78,0	0,4
2050	107	116	224	24	1	26	2 522	97,5	0,4
2060	163	233	396	36	2	38	5 314	141,2	0,3
2070	244	450	694	50	3	53	10 331	195,4	0,3
2080	357	814	1 172	71	3	74	19 055	257,3	0,3
2090	514	1 448	1 962	99	5	103	33 938	328,4	0,3
2100	733	2 475	3 208	138	6	144	58 694	406,7	0,3

[1] Expressed as the number of times the reserve covers current year's expenditures.

▶ Appendix 5. Topics related to funding policy

This appendix describes in more detail different topics related to the funding policy discussed in Section 5: automatic adjustment mechanisms applied in different countries, description of financing systems and funding targets.

Automatic adjustment mechanisms

Notional Defined Contribution system. In Sweden, the most important part of the social security pension system is based on a Notional Defined Contribution (NDC) approach. Under an NDC, contributions are not invested in the financial markets but earn a notional return linked to the economy, like the general salary increase or the GDP growth. **T**he contribution rate of the NDC is 16 per cent. If the pension scheme is not in financial equilibrium, the indexation of pensions or the rate of return on the notional account is adjusted downward to restore the financial position. The calculation of the financial equilibrium is done through the balance ratio where assets are compared to liabilities. If the ratio is equal to 1, the scheme is in financial equilibrium. Assets include both financial assets (buffer fund) and contribution assets. Liabilities includes the present value of pensions in payment and the sum of the accounts of persons not yet retired.

Automatic adjustment of contribution rate. In Canada, the contributory social security pension system is partially funded. It has, however, the particularity of having two portions of the earnings replacement rate being financed differently. Briefly, 25% of income replacement rate is financed on a partially funded approach while an additional 8.33% (for a total income replacement rate at age 65 of 33.33% = 25% + 8.33%) is financed on a fully funded approach. People will eventually have access to the entire 8.33% after having contributed for a complete career (approximately 40 years). Today, Canadians receive an income replacement of 25% at age 65 and in forty years it will be 33.33%. This additional 8.33% of income replacement rate was introduced in 2019 in response to provincial and federal governments wanting to secure adequate retirement savings because of the decrease of occupational pension plans. It was decided to fully fund this new part of the benefits to avoid important transfers between generations like it is the case for the first 25% of income replacement rate.

For the partially funded part of the law (25% income replacement rate), the law specifies a funding objective. The contribution rate should be the lowest contribution rate (steady-state contribution rate) that, in the long term, would stabilize the reserve ratio. The reserve ratio is equal to the assets divided by one year of expenditures. There is no target level of assets. The objective is only the stability of the contribution rate over time. If the contribution rate calculated in the actuarial valuation is higher than the current legal contribution rate, there is an automatic adjustment mechanism. If the calculated contribution rate exceeds the rate provided for by law, contributions and benefits are both adjusted if the federal and provincial governments do not agree on specific measures to restore the financial equilibrium. In that case:

- The contribution rate is increased by half of the excess of steady-state contribution rate over current contribution rate, and

- Benefits are frozen until next review (3 years)

Automatic adjustment in line with life expectancy. Life expectancy generally increase over time. If members live longer and thus receive benefits for a longer period, an adjustment can be automatically made to reduce the pressure on the cost of the scheme. This kind of mechanism improves equity between generations of participants and reduces the financial burden brought by the improvement of mortality over time.

There are social security pension schemes that according to their design, are adjusted automatically to the increase of life expectancy. It is the case of NDC plans that are using annuity factors in the calculation of

pension amounts. Italy, Sweden, and Poland are based on the NDC system. So, in these schemes, the retirement age is not increased with increases in the life expectancy. Instead, pensions are reduced with the hope that people will delay their pension to avoid a decrease of their income replacement rate.

On the other hand, Denmark, Finland, and Portugal adjust the retirement age with the increase of life expectancy. In Denmark and Finland, when life expectancy increases by 1 year, the retirement age increases by 1 year. In Portugal, there is an 8-month retirement age increase for each 12-month increase in life expectancy.

In France, while the retirement age is also increasing, the minimum eligibility condition required for a full pension is adjusted in line with life expectancy.

Automatic adjustment of the level of benefits. It is possible, without targeting a cause explicitly, like the increase in life expectancy, to modify some parameters of a pension scheme to consider the deterioration of the experience and the associated increase in pension costs.

In Sweden, for example, after calculating the balance ratio, as explained above, if the funding ratio is under 1, the indexation of pensions or the return on assets are adjusted downward to restore the financial equilibrium.

Germany uses the concept of "sustainability factor" to adjust benefits. The sustainability factor is defined as:

$$1 + \frac{\Delta DR_{t-1}}{DR_{t-2}} x \propto$$

Where DR is the demographic ratio which is equal to the number of pensioners divided by the number of contributors. The factor α, the sustainability parameter, is used to consider to which degree the deterioration in the demographic ratio is going to be reflected in the indexation of pensions. Currently, the indexation parameter is 0.25. The demographic factor takes indirectly into account the increase in life expectancy. In Germany, if there is an increase of the contribution rate, it is financed by contributors through a reduced adjustment of the point before retirement (similar as adjusting the salary indexation before retirement). It is important to note that in Germany, pensions are usually with the general salary growth. Japan uses a similar concept, the "modifier", to adjust the indexation of pensions. The modifier in Japan is based on the decrease in number of contributors and the increase in life expectancy.

Financing systems

The role of the actuarial method as part of the financing policy of a pension scheme is to allocate the cost of the benefits and to calculate the required level of funding. Actuarial methods to be used for an actuarial valuation will first depend on the financing system that is chosen. There are three broad financing systems: the pure pay-as-you-go (PAYG) system, partial funding and full funding.

Pay-as-you-go. Under this financial system, the contribution rate during a given period, for example one year (annual assessment) or a few years, is determined in such a way that the income from contributions during a period will just cover the expenditure of the scheme during the same period, with a small margin to allow for the constitution of a contingency reserve. This is the system usually applied to finance short-term benefits such as sickness and maternity cash benefits. Annual benefit expenditure is expected to remain at a relatively constant level once the scheme has attained a certain maturity, unless benefit provisions have been changed. The contingency reserve enables coverage of unexpected expenditure due to temporary fluctuations in revenues or expenditures. The reserve should, therefore, be maintained in a sufficiently liquid form so that it can be readily used when necessary. If a pure assessment system were applied to a new pension scheme, it would involve frequent revisions of the contribution rate. The annual expenditure under a new pension scheme would begin at a comparatively low level and would increase continuously over a long period of time, due to an increasing number of pensioners. Another reason for escalating annual expenditures is that each new group of pensioners will be drawing higher pensions due to longer insurance periods compared with previous generations of pensioners.

Partial funding. Different approaches that can be used to partially fund a system, depending on the level of funding that is targeted. Two of these approaches are the general average premium (GAP) and the scale premium.

General average premium. A general average premium (GAP) approach provides for a theoretically constant rate of contribution ensuring financial equilibrium ad infinitum. At any time, the present values of all probable future contributions income plus accumulated reserves should be equal to the present value of all probable future outlays, both in respect of the initial population and of future entrants. The contribution rate determined under this system would be relatively high and would lead to the formation of high reserves. Though theoretically constant, in practice the contribution rate is likely to be revised at periodic actuarial reviews. If this approach were applied to a new pension scheme from the start, the rate of contributions would be relatively high and this could cause an undue burden on the economy and on the contributing parties. In this case, the economy should be able to invest and maintain a very large number of investments with appropriate investment management and risk analysis techniques. At the start of the pension scheme, when using this approach with a very long projection period, like 150-200 years, this approach produces a level of funding which is a proxy of a fully funded system. An interesting feature of this approach is that, by considering a very long period of time, the financing strategy includes many generations of contributors which is a desired characteristic for a social security pension scheme.

Scaled premium. It is possible to devise many intermediate systems of finance between the basically unfunded (PAYG) pure assessment system and the largely funded GAP approach over a long projection period. The following factors frequently lead to the adoption of an intermediate system of finance:

– The contribution rate must not be excessive (with respect to the capacities of the members and the economy in general).

– The initial – and any subsequent – contribution rates established under the system of finance applied to the scheme should remain relatively stable for reasonable periods of time. Increases in the contribution rate should be gradual, particularly when they are not accompanied by an improvement in benefits.

An example of an intermediate level of funding is the scaled premium approach. Under this approach, a contribution rate is established so that during a specified period (known as the period of equilibrium) the contribution income and the interest income on the reserves of the scheme will be sufficient to meet the expenditure on benefits and administration over the period of equilibrium. In order to avoid a decrease in the reserves after the end of a period of equilibrium, the contribution rate must be revised prior to the end and a new higher contribution rate should be applied during a new period of equilibrium. Thus, the financial equilibrium would be assured for limited periods, such as 10, 15 or 20 years, within each of which the contribution rate will remain stable. The approach requires a moderate accumulation of funds, which depends on the length of the period of equilibrium. A short period of equilibrium would result in a low contribution rate, which would have to be increased frequently, and would bring a small accumulation of funds, thus approaching the pay-as you-go system. A long period of equilibrium would result in a higher initial contribution rate and larger accumulation of funds, and consequently be closer to the GAP approach. The scaled premium approach is flexible, as it permits adaptation to changes in scheme's conditions and environment. It should be emphasized, however, that the approach requires periodic increases of the contribution rate, which are not accompanied by benefit improvements. Although the contribution rate during the initial period of equilibrium will be lower than that under the GAP approach, eventually a stage will be reached when it will exceed the contribution rate required under GAP.

Full funding. Instead of relying on younger generations of workers to support the benefits of the older generations, each generation is required to set aside enough money to support their own benefits. At each moment of the life of the pension scheme, accumulated contributions and investment income shall be enough to pay promised benefits. If not, deficits must be amortized over a given period. This kind of financing system is more prevalent in the private pension world because it protects workers if the pension plan ends, whereas

public pension schemes are supposed to be in place forever. The full-funding approach aims at minimizing intergenerational transfers. Hence it does not promote intergenerational solidarity. For example, in Canada, in 2019, an additional income replacement rate has been introduced to increase ultimately the current level from 25% to 33.33%. This additional 8.33%, which was the response of the provincial and federal governments for securing adequate retirement savings because of the decreasing of occupational pension plans, has the particularity to be fully funded because of the wish of the Canadian society to minimize intergenerational transfers (for this part of the system).

What is the best system?

There is no single answer to that question. It depends on the particular context of each country, the objectives of the stakeholders and the limits and constraints in which the pension scheme operates. All methods have their risks, advantages and disadvantages. However, most social insurance pension schemes have historically been established on the principle of social solidarity and are therefore partially funded. Social insurance schemes represent a social contract under which the current generation of contributors accept that their contributions are used to pay the benefits of current pensioners. This creates for the current generation of contributors a right to the contributions of future generations of contributors.

In an economy where there is real salary growth (i.e. in excess of inflation), future generations of workers will have higher salary (in real terms) than the current generation of workers and may therefore be able to afford higher contributions. Partial funding also allows for gradual contribution rate increases which may take into account the economic development of a country.

Funding indicators

It is useful to present an overview of different funding indicators.

Reserve-to-expenditure ratio. The reserve-to-expenditure ratio (RER ratio) reflects the size of the year-end reserve relative to annual expenditures. This ratio can be defined as a proxy of a funding level at a particular point in time. In fact, it represents the number of years that current pensions can be paid without additional inflows in the scheme (contributions or investment income). While it is usually used for simplicity, the problem with this indicator is that it may be misleading, especially when the social security pension scheme is not yet mature. In fact, its current level is not representative of the long-term pattern, especially in the case of an non-mature pension system. The RER ratio is an indicator used by a pension plan choosing to adopt a partially funded system.

Accrued liabilities' funding ratio. The accrued liabilities funding ratio (ALFR) is a concept that is used for private pension plans. For occupational pension plans in the private sector, only benefits related to services prior to the valuation date are normally considered in the actuarial valuation. On a going-concern basis for financing purposes, the accrued liabilities take into account future salary increases to calculate the cost of the service carried out prior to the valuation date. The actuarial valuation also determines for the years following the valuation and until the next valuation date, the contributions required by the sponsor to fund benefits for current service (often referred to as the *normal cost*). Additional contributions necessary to fund the deficit for past services, according to the jurisdiction's legispation, are determined. Accrued liabilities are limited to accrued benefits, since the plan may terminate at any time and it is not appropriate to consider the accrual of benefits after the valuation date.

For a social security scheme, the possibility of terminating is low or non-existent.

Can this funding ratio be a useful financial indicator for a social security scheme? Yes, it can be used but unless the goal is to totally fund the accrued liabilities of the scheme in order to protect participants against a termination of the plan, this funding ratio should not be the indicator that should be used for a social security pension scheme. In fact, some information may be missing. Even if the objective is to be fully funded, the funding ratio that should be used for a social security pension scheme should bear a closer relation to the fact that the termination of the scheme is not the main stake to be addressed.

In Canada, this approach is used for the Quebec Pension Plan to calculate the contribution rate that is necessary to finance the part of the pension system which is fully funded. Briefly, the contribution rate is defined as the one which allows the scheme to be fully funded in 20 years using the ALFR approach.

Global funding ratio. For occupational pension plans in the private sector, as it is said previously, only the benefits that have been acquired for services carried out prior to the valuation date are usually considered in the actuarial valuation since the plan may terminate. Because social security systems are not subject to termination, private pension financing approach needs to be adapted to this situation, by taking into account not only the service prior to the valuation date, but also the future contributions and future benefits acquired after the valuation date. This is the global funding ratio (GFR). Under this approach, the total value of assets plus the present value of future contributions of members at valuation date is compared with the present value of all benefits that will be paid. The result shows the financial situation of the system as it would apply to existing participants at the valuation date until their death and the death of their survivors.

Open-group funding ratio. The two previous funding indicators (accrued ALFR and GRF), are based on a closed group approach where the members considered are those at the valuation date. A third method to calculate the funding ratio is based on an open group approach where members who will join the scheme after the valuation date are also considered. This is the approach used by the Canadian Pension Plan (CPP). The funding ratio is based on the ratio of the value of assets at valuation date plus the present value of the future contributions of the current and future members divided by the present value of all future expenditures (benefits + administrative) for current and future members over a very long period of time. The CPP uses a projection period of 150 years for this exercise. This method has the merit of taking into account the continuous existence of a social security system: it can never end and was set up through intergenerational solidarity. In fact, this approach acknowledges the fact the main source of financing of the social security pension scheme is not only the return on investments but also the contributions of workers.