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Retiree Dynamics in Slovenia and the Adequacy of Minimum Pensions in Relation to GDP

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Demographic ageing and the associated increase in the old-age dependency ratio pose significant challenges to the long-term sustainability of pay-as-you-go (PAYG) pension systems across Europe. Slovenia, as a post-transition economy, faces additional pressures in balancing fiscal sustainability with adequate income protection for retirees. This paper aims to assess the evolution of pension adequacy and sustainability in Slovenia between 1991 and 2025, with particular emphasis on testing five research hypotheses (H1–H5) related to replacement rates, minimum pensions, pension expenditure, and the support ratio. The study applies a longitudinal quantitative analysis based on data from the Statistical Office of the Republic of Slovenia (SURS) and the Pension and Disability Insurance Institute of Slovenia (ZPIZ). Key indicators include the net replacement rate, minimum pension as a share of average wage, pension expenditure as a percentage of gross domestic product (GDP), and the support ratio. Comparative analysis with EU-27 benchmarks is complemented by a regression analysis, correlation analysis, and one-sample t-tests to evaluate the proposed hypotheses. The findings indicate a clear divergence between adequacy and sustainability. Hypotheses H1, H2, and H3 are confirmed: minimum pensions have declined relative to wages, have not kept pace with GDP per capita, and remain significantly below the 40% adequacy threshold. In contrast, H4 and H5 are rejected: pension expenditure as a share of GDP has not increased relative to the EU average, and the support ratio, although declining, remains above the critical threshold of 1.5. These results suggest that fiscal sustainability has been maintained, while adequacy has weakened. The Slovenian pension system demonstrates a structural trade-off between sustainability and adequacy. While fiscal discipline has been preserved, this has occurred at the expense of minimum income protection. Policy implications indicate that there is room for targeted reforms to improve pension adequacy without undermining long-term fiscal stability.

Keywords: pension systems, support ratio, PAYG, Slovenia, minimum pension

THEMATIC SECTION

1 Introduction

Pension systems represent one of the fundamental institutional forms of ensuring social security in modern societies. In the context of demographic ageing, fiscal constraints, and evolving labour markets, the questions of pension adequacy and financial sustainability are becoming increasingly urgent (Barr, 2006; European Commission [EC], 2021). Slovenia, as a member of the European Union (EU), is no exception: it faces a high pension coverage rate, a declining ratio of contributors to beneficiaries, and a rising share of pension expenditure in GDP (Zavod za pokojninsko in invalidsko zavarovanje Slovenije [ZPIZ], 2025; Statistical Office of the Republic of Slovenia [SURS], 2025).

The theoretical framework of this analysis builds on two core concepts: replacement rate and fiscal sustainability of pension systems. Replacement rate measures the ratio between pension benefits and pre-retirement income or average wages and is commonly used as a key indicator of pension adequacy by the Organisation for Economic Co-operation and Development (OECD, 2025). Fiscal sustainability, on the other hand, reflects a country's ability to finance pensions over the long term, without imposing an unsustainable burden on future generations, or jeopardizing public finances (Holzmann & Hinz, 2005).

Slovenia's pension system is formally structured as a mandatory pay-as-you-go (PAYG) scheme, in which current workers fund the pensions of present day's retirees. However, this model is under increasing pressure due to population ageing, a shrinking base of active contributors, and relatively low contribution rates compared to the growing pension burden (Vlada Republike Slovenije, 2025).

Pension policy analysis often distinguishes between adequacy—whether pensions provide a decent standard of living—and sustainability—whether the system is economically viable. These two dimensions are not mutually exclusive but require a balanced approach that considers both the right to social security and macroeconomic constraints. International comparisons (Eurostat, 2025b; OECD, 2025) show that, while Slovenia maintains a relatively high replacement rate in some areas, it also carries a significant fiscal burden in terms of pension expenditure as a share of gross domestic product (GDP) and faces long-term sustainability risks (EC, 2021).

This paper focuses on an empirical analysis of the key indicators of Slovenia's pension system between 1991 and 2025, and compares them with selected EU and Western Balkan countries (2014 and 2023). The analysis includes pension expenditure as a share of GDP, average pension per beneficiary, pension-to-wage ratio, and pension entitlements expressed as a share of GDP. The goal is to assess whether Slovenia's pension system is evolving toward economic and social balance.

For the purposes of the research, the following research question was formulated: How have the adequacy and sustainability of old-age pensions in Slovenia evolved compared to EU countries, with respect to pension expenditure as a share of GDP, average pension per beneficiary, and the pension-to-wage ratio?

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2 Method

2.1 EU and Western Balkans

The EU-27 is employed as the main comparator due to the fact that Slovenia is a member of the EU, and its pension system is heavily influenced by the policies of the Union regarding fiscal and social coordination. Western Balkan nations have some institutional commonalities; however, comparable data concerning their pension adequacy measures are not readily available. The data (Table 1) clearly show that pension outcomes across Europe differ substantially, both in nominal terms and when adjusted for purchasing power. While the EU-27 average annual pension amounts to 17,321 EUR and replaces around 63% of average net replacement rate, many countries fall well below this benchmark, particularly in Central and Eastern Europe. Adjusting pensions for purchasing power reduces cross-country disparities, but it does not eliminate them, indicating that differences in living standards in old age remain significant.

Table 1. *Comparison of pension levels, replacement rates, and pension expenditure across European countries (2023)*

	Country	Average annual pension (€)	Average annual pension (PPS)	Pension expenditure (% of GDP)	Net replacement rate (%)
1	EU-27	17,321	17,321	12.3%	63.16%
2	Iceland	38,031	22,618	10.5%	109.61%
	Denmark	30,543	21,169	11.5%	105.18%
	Luxembourg	34,413	22,817	10.2%	95.37%
	Italy	21,085	21,424	15.5%	85.04%
	Belgium	24,248	20,265	12.8%	81.33%
	Finland	22,813	17,814	13.7%	79.05%
	Spain	19,844	21,786	13.2%	77.30%
	Norway	28,176	21,723	9.8%	76.65%
	Ireland	24,057	17,049	4.2%	75.65%
	Sweden	22,674	18,558	10.7%	75.49%
	Austria	25,486	21,932	14.4%	72.91%
	France	19,756	18,113	14.6%	70.66%
	Netherlands	25,417	20,988	11.1%	65.49%
	Portugal	11,535	13,628	12.5%	64.73%
	Greece	12,854	15,508	14.0%	62.10%
	Switzerland	28,559	15,549	11.2%	60.79%
	Germany	19,138	17,554	11.5%	55.07%
	Cyprus	12,751	13,415	7.6%	51.08%
	Malta	10,995	11,919	5.2%	47.71%
3	Czechia	10,113	12,016	9.2%	54.52%
	Slovenia	9,439	10,503	9.5%	49.85%

	Country	Average annual pension (€)	Average annual pension (PPS)	Pension expenditure (% of GDP)	Net replacement rate (%)
	Estonia	8,388	8,641	8.1%	47.11%
	Latvia	6,477	8,392	8.6%	39.53%
	Poland	8,386	12,841	10.8%	38.32%
	Slovakia	5,688	7,079	8.7%	36.91%
	Hungary	6,129	9,978	7.1%	35.02%
	Lithuania	5,979	7,676	6.9%	33.08%
	Croatia	5,570	7,825	8.8%	32.89%
	Romania	5,790	10,531	8.3%	32.65%
	Bulgaria	4,479	8,026	9.5%	26.75%
4	Montenegro	4,855	8,090	7.8%	39.80%
	Serbia	4,239	7,146	8.6%	37.85%
	Bosnia and Herzegovina	3,659	6,658	9.6%	37.34%
5	Türkiye	3,377	8,756	5.2%	32.16%

Source: *(Yanatma, 2025; Eurostat, 2025a; Eurostat, 2025b; Eurostat, 2025c; OECD, 2025; Agency for Statistics of Bosnia and Herzegovina, 2025; Statistical Office of the Republic of Serbia, 2025; Statistical Office of Montenegro [MONSTAT], 2025; Rakic, 2024)*

Note: *Replacement rate data for non-EU countries (Western Balkans) are not fully comparable with EU/OECD indicators due to differences in methodology and data availability.*

The following nations listed in Table 1 and Table 2 can be categorized into five types analytically based on: (1) EU-27 average, which is the benchmark for the European Union in general; (2) high income Western/Northern Europe; (3) Central and Eastern Europe (CEE), comprising mainly former transition economies that have distinctive structures; (4) Western Balkans, which includes non-EU countries in Southeast Europe with relatively new economic structures and pension system reforms; and (5) Türkiye.

Table 2. *Pension expenditure as a share of GDP in the EU-27 and Euro area (2012–2023)*

	Country / TIME	2012	2015	2020	2023	Min	Max	Average (2012–2023)
1	EU-27	12.91	12.97	13.53	12.30	12.21	13.53	12.81
	Euro area (20)	13.20	13.29	14.02	12.70	12.66	14.02	13.18
	Euro area (19)	13.22	13.31	14.04	12.72	12.67	14.04	13.20
2	Belgium	11.88	12.52	13.53	12.81	11.88	13.53	12.55
	Denmark	12.75	13.51	12.85	11.50	10.96	13.98	12.62
	Germany	11.66	11.64	12.57	11.48	11.48	12.57	11.74
	Ireland	8.13	5.57	4.92	4.24	3.90	8.13	5.63
	Greece	18.17	17.84	17.47	14.01	14.01	18.17	16.53
	Spain	11.83	12.54	14.39	13.16	11.83	14.39	12.83

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	Country / TIME	2012	2015	2020	2023	Min	Max	Average (2012–2023)
	France	14.88	15.15	16.05	14.61	14.61	16.05	15.11
	Italy	15.93	16.35	17.53	15.49	15.48	17.53	16.08
	Cyprus	8.14	10.06	9.30	7.58	7.58	10.06	8.96
	Luxembourg	9.13	9.23	10.16	10.18	9.13	10.18	9.52
	Malta	8.82	7.04	6.44	5.17	5.17	8.82	6.73
	Netherlands	11.78	11.96	12.07	11.13	10.56	12.07	11.57
	Austria	14.50	14.66	15.38	14.44	14.01	15.38	14.54
	Portugal	14.52	14.97	14.94	12.54	12.54	15.64	14.34
	Finland	12.49	13.32	13.95	13.73	12.49	13.95	13.33
	Sweden	11.65	11.32	11.24	10.73	10.73	12.03	11.20
	Iceland	8.07	8.37	12.00	10.45	8.07	12.00	9.61
	Norway	8.57	10.25	11.83	9.79	8.04	11.83	9.95
	Switzerland	11.26	11.61	12.27	11.18	11.00	12.27	11.54
	United Kingdom	11.48	11.25	12.50	11.50	10.65	12.50	11.31
3	Bulgaria	8.02	8.53	8.06	9.48	7.52	9.48	8.27
	Czechia	9.20	8.54	9.10	9.17	7.97	9.20	8.64
	Estonia	7.53	7.90	8.54	8.06	7.37	8.54	7.72
	Croatia	10.36	10.49	10.99	8.83	8.83	10.99	10.05
	Latvia	8.55	7.92	8.43	8.58	7.70	8.58	8.13
	Lithuania	7.60	6.83	7.38	6.86	6.70	7.60	7.01
	Hungary	9.29	8.54	7.47	7.07	6.68	9.38	7.96
	Poland	11.57	11.55	11.27	10.81	10.09	12.00	11.16
	Romania	8.30	8.10	8.95	8.30	7.80	8.95	8.28
	Slovenia	11.38	10.97	10.61	9.46	9.46	11.62	10.48
	Slovakia	8.14	8.45	8.73	8.65	8.04	8.73	8.41
4	Bosnia and Herzegovina	9.40	9.70	9.88	9.60	8.46	9.97	9.39
	Montenegro	10.50	9.90	10.08	7.80	7.80	10.50	9.29
	North Macedonia	8.50	8.01	8.40	8.20	7.97	8.50	8.24
	Albania	5.80	6.10	6.80	6.20	5.80	6.80	6.24
	Serbia	12.02	10.98	9.90	8.58	8.36	12.02	10.21
5	Türkiye	7.22	7.04	7.20	5.16	4.65	7.61	6.72

(Eurostat, 2025c; OECD, 2025)

Slovenia ranks between the middle and lower tiers among European states in terms of pension performance. The value of pensions in nominal terms is considerably lower than the European Union average, and even after taking into account the purchasing power,

Slovenia is still behind many states from Western and Northern Europe. Moreover, the fact that Slovenian pensions replace less than 50% of prior income implies low income security among retirees.

Nevertheless, the expenditure on pensions in Slovenia amounts to about 9.5% of its GDP; thus, it appears to be lower than the EU-27 average value. Therefore, the example of Slovenia shows lower public expenditure – a tendency observed across the continent. In general, according to the data presented in Table 1, the pension system in Slovenia represents a relatively restrained fiscal approach, though it provides relatively modest replacement of incomes during retirement.

Table 2 shows that with respect to each group of countries, there are unique features connected with pension expenditure's to GDP ratio. Thus, the pension expenditure ratio to GDP of the EU-27 (1) and the Euro area countries has been relatively stable and made 12.21–13.53%. As for Western/Northern Europe (2), it is necessary to highlight that the pension expenditure to GDP ratio is the highest compared to other groups of countries, namely 15–17%. The reason lies in the high development of welfare state in this group of countries and old population. The only exception to this trend is Ireland, where the pension expenditure to GDP ratio is substantially lower. Concerning CEE (3), pension expenditure to GDP ratio is quite low as it equals 7–11% of the GDP and decreases with time. However, it is also worth mentioning that in the Western Balkans (4) pension expenditure to GDP ratio is low enough (comparable with that in the CEE countries), but is slightly higher (equals 5–12%). At the same time, it is the lowest in Albania in this group of countries.

Finally, pension expenditure to GDP ratio in Türkiye (5) equals 5–7%.

The level of expenditure on pensions in Slovenia decreased from 11.6% in 2013 to 9.5% in 2023, making it lower than the European average. Slovenia is one of the countries of the Central and Eastern European (CEE) region that spends relatively more money on pensions; the average expenditure in Slovenia equals 10.48%, which is close to the share spent on Western European pensions. Generally speaking, within the considered timeframe, expenditure tended to decline, from 11.3–11.6% initially, down to 9.46% in 2023, reflecting the effects of pension reforms and other economic adjustments. As compared to the rest of the countries in the CEE region, Slovenia has a better-developed pension system, but also makes attempts to enhance its sustainability through controlling expenditure.

As can be seen, there is significant variation across countries in Europe in terms of their fiscal obligations to provide pensions for citizens.

2.2 Slovenia

Table 3 shows significant long-term demographic and fiscal changes in the Slovenian pension system. The most important trend is gradual deterioration of the ratio between insured persons and pensioners (see 5 in Table 3), which declined from 2.08 in 1991 to approximately 1.53 in 2025. This means that today there are considerably fewer active contributors per pensioner, which directly increases pressure on the sustainability of the system. At the same time, the share of pensioners in the total population (6) increased (from around 20% to over 30%), further confirming the process of population ageing.

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Table 3. *Demographic and financial trends of the Slovenian pension system (1991–2025)*

1	2	3	4	5= 3:4	6= 2:4	7	8	9	10	11	12= 11:10	13= 7:8	14= 9/11	15= 7/4
1991	2,002	0,817	0,393	2.08	0.20	0.15	1,46	5,131	70	34	0.49	0.10	151	32
1992	1,996	0,765	0,420	1.82	0.21	0.51	4,25	4,854	213	39	0.18	0.12	125	101
1993	1,991	0,783	0,430	1.82	0.22	0.74	5,99	5,450	315	47	0.15	0.12	116	143
1994	1,989	0,773	0,433	1.78	0.22	0.99	7,73	6,115	395	60	0.15	0.13	101	190
1995	1,988	0,769	0,437	1.76	0.22	1.20	10,57	8,317	467	68	0.15	0.11	123	229
1996	1,991	0,766	0,442	1.73	0.22	1.36	12,13	8,616	539	79	0.15	0.11	109	256
1997	1,987	0,783	0,449	1.75	0.23	1.54	13,81	9,237	602	85	0.14	0.11	109	286
1998	1,983	0,784	0,455	1.72	0.23	1.71	15,29	9,924	660	90	0.14	0.11	110	314
1999	1,986	0,800	0,460	1.74	0.23	1.84	17,15	10,700	723	102	0.14	0.11	105	333
2000	1,990	0,839	0,467	1.80	0.23	2.05	18,73	11,005	800	110	0.14	0.11	100	365
2001	1,992	0,841	0,475	1.77	0.24	2.26	20,94	11,598	895	125	0.14	0.11	93	397
2002	1,996	0,837	0,484	1.73	0.24	2.51	23,27	12,357	982	130	0.13	0.11	95	432
2003	1,997	0,834	0,492	1.70	0.25	2.67	25,38	13,035	1,057	140	0.13	0.11	93	453
2004	1,997	0,837	0,498	1.68	0.25	2.83	27,42	13,774	1,117	145	0.13	0.10	95	473
2005	2,001	0,843	0,505	1.67	0.25	2.98	28,91	14,447	1,157	153	0.13	0.10	95	491
2006	2,009	0,855	0,511	1.67	0.25	3.16	31,29	15,589	1,213	158	0.13	0.10	99	515
2007	2,019	0,879	0,519	1.69	0.26	3.35	34,94	17,305	1,285	167	0.13	0.10	104	539
2008	2,023	0,904	0,528	1.71	0.26	3.68	37,74	18,666	1,391	181	0.13	0.10	103	581
2009	2,042	0,895	0,538	1.66	0.26	3.86	35,83	17,550	1,439	187	0.13	0.11	94	597
2010	2,049	0,882	0,553	1.60	0.27	4.00	36,05	17,596	1,495	191	0.13	0.11	92	604
2011	2,052	0,870	0,570	1.53	0.28	4.14	36,78	17,918	1,525	193	0.13	0.11	93	605
2012	2,056	0,856	0,585	1.46	0.28	4.15	35,93	17,471	1,525	193	0.13	0.12	91	590
2013	2,059	0,833	0,602	1.38	0.29	4.25	36,04	17,500	1,523	197	0.13	0.12	89	589
2014	2,062	0,844	0,609	1.39	0.30	4.29	37,27	18,077	1,540	198	0.13	0.12	91	587
2015	2,063	0,875	0,612	1.43	0.30	4.20	38,49	18,656	1,556	200	0.13	0.11	93	572
2016	2,064	0,891	0,614	1.45	0.30	4.25	40,01	19,380	1,585	202	0.13	0.11	96	577
2017	2,066	0,914	0,616	1.49	0.30	4.31	42,63	20,634	1,627	207	0.13	0.10	100	584
2018	2,070	0,939	0,617	1.52	0.30	4.47	45,46	21,942	1,682	218	0.13	0.10	101	604
2019	2,089	0,961	0,620	1.55	0.30	4.64	48,16	23,052	1,754	227	0.13	0.10	102	623
2020	2,100	0,958	0,625	1.53	0.30	4.93	46,74	22,227	1,856	246	0.13	0.11	90	658
2021	2,107	0,965	0,625	1.54	0.30	5.20	52,03	24,686	1,970	280	0.14	0.10	88	693
2022	2,109	0,989	0,628	1.57	0.30	5.64	56,88	26,966	2,024	295	0.15	0.10	91	748
2023	2,121	0,999	0,635	1.57	0.30	6.03	64,05	30,205	2,221	310	0.14	0.09	97	791
2024	2,131	0,999	0,643	1.55	0.30	6.69	67,42	31,698	2,395	337	0.14	0.10	94	866
2025	2,134	0,997	0,653	1.53	0.31	7.16	73,00	34,000	2,536	353	0.14	0.10	96	914

(ZPIZ, 2025; SURS, 2025)

Indicator Definitions and Calculations:
1 → Year
2 → Total population in the Republic of Slovenia (million)
3 → Insured persons (million)
4 → Pension beneficiaries – mandatory insurance (million) 5=3:4 → Number of insured persons per pension beneficiary
6=2:4 → Share of pension beneficiaries in the total population of the Republic of Slovenia
7 → Pension expenditure (€ billion)
8 → GDP (€ billion)
9 → GDP per capita (€)
10 → Average gross wage (€)
11 → Minimum pension (€)
12=11:10 → Minimum pension as a share of the average gross wage 13=7:8 → Pension expenditure (% of GDP)
14=9/11 → Number of Minimum pension (€) in GDP per capita (€) 15=7/4 → Average pension (€)

From a financial perspective, pension expenditure (7) has increased significantly in nominal terms (from €0.15 billion to approximately €7.16 billion), while its share of GDP (8) has remained relatively stable (13) or slightly declined (from around 10–15% in the 1990s to approximately 9–10% in recent years). This suggests that economic growth has partially offset the increase in expenditure. Nevertheless, the growth of the average pension (15) (from about €32 to €914) has lagged behind the wage growth and GDP per capita (14), indicating a gradual decline in the relative generosity of the system.

In addition, the minimum pension as a share of the average wage (12) remains relatively low, at around 13–15%, implying limited income protection for the lowest pension recipients. At the same time, the ratio between GDP per capita and the minimum pension indicates that economic growth has not been fully transmitted to the pension system.

Overall, the table confirms that the Slovenian pension system faces a dual challenge: demographic pressure and the need for fiscal sustainability. Although reforms and economic growth have helped mitigate these effects, long-term trends remain unfavourable.

2.3 Research hypotheses and theoretical grounding

This study builds on the established pension system theory and institutional indicators to formulate testable hypotheses about the adequacy and sustainability of old-age pensions in Slovenia. The theoretical grounding draws primarily on the adequacy indicators developed by the Organisation for Economic Co-operation and Development (OECD, 2025), sustainability analyses by the European Commission (EC, 2021), and the social protection principles defined by the International Labour Organization (ILO, 2021).

Falling net replacement rate points to erosion of the pension system's adequacy

Replacement rate is a central measure of pension adequacy (OECD, 2025; Eurostat, 2025b). A declining trend implies that the pension system fails to maintain retirees' living standards relative to their pre-retirement income. The replacement rate is a key indicator of pension system performance, as its decline signals a reduced capacity to maintain retirees' living standards after retirement. Numerous empirical studies confirm this trend across

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different countries. Jgerenaia and Ghaniashvili (2024) identify adverse changes in pension system adequacy indicators in most European countries over the period 2010–2023. Similarly, Gorlin et al. (2020) point out that replacement rates for higher-income groups in Russia lag behind the levels observed in most European Union countries. Urbano et al. (2021) warn of a projected further decline in replacement rates, which is expected to disproportionately affect younger generations. In addition, Chen et al. (2021) find that pension systems in Northwestern China fail to provide sufficient income to cover the basic living needs of the elderly population. Taken together, these findings indicate that many pension systems face serious challenges in preserving pre-retirement income levels.

H1: The net replacement rate (average pension as a share of average wage) in Slovenia declined between 1991 and 2025, suggesting a decrease in pension adequacy.

Pension growth does not keep pace with economic growth

Based on the life-cycle income hypothesis (Modigliani, 1986), retirees expect to maintain consumption in retirement proportional to the national income growth. A gap between pension growth and GDP per capita may signal a weakening redistributive function. Multiple studies point to significant challenges to the original life-cycle theory. Jappelli (2005) documents increasing empirical evidence that contradicts its core assumptions, notably the continued accumulation of savings after retirement and the persistence of intergenerational wealth transfers. Similarly, Le Garrec (2012) emphasizes that most pension systems primarily redistribute income from workers to retirees, without necessarily leading to a reduction in the overall income inequality.

More recent research provides concrete evidence of uneven consumption outcomes around retirement. Kolsrud et al. (2024) show that individuals who retire earlier experience substantially larger declines in consumption, indicating imperfect consumption smoothing. Riekhoff and Järnefelt (2018) further demonstrate that pension systems may reinforce the existing inequalities, as heterogeneous retirement paths are associated with markedly different pension entitlements. Taken together, these findings suggest that the relationship between pension growth and national income is considerably more complex than the simple proportional maintenance of the consumption implied by the traditional life-cycle framework.

H2: Minimum pensions in Slovenia have not grown in line with GDP per capita, indicating that retirees' relative income has not kept up with the overall economic development.

Minimum pensions remain below adequacy thresholds

The ILO and European Pillar of Social Rights recommend that minimum pensions ensure income above the poverty line. A benchmark of 40% of the average wage is often used to assess the minimum income protection (ILO, 2021; EU, 2024). The empirical evidence supporting this recommendation is nuanced and context dependent. Ortiz et al. (2018) emphasize the ILO's principles, which state that social protection benefits should be set at least at the national poverty line in order to ensure basic income security. In contrast, Figari et al. (2013) demonstrate

substantial cross-country variation in the effectiveness of minimum income schemes, showing that in several cases beneficiaries remain below the poverty threshold even after receiving transfers. Penne et al. (2020) further argue that adequate minimum income protection cannot be assessed solely in terms of benefit levels, but must also encompass effective labour market inclusion and access to high-quality public services. Although a 40% benchmark is frequently cited in policy discussions, the reviewed literature suggests that such a threshold should not be interpreted as a universal standard. Rather, it represents a complex guideline whose adequacy depends on national economic conditions, institutional frameworks, and social policy design.

H3: The minimum pension in Slovenia has remained below 40% of the average gross wage, failing to meet the adequacy thresholds recommended by international standards.

Pension expenditure in GDP is increasing faster than the EU average

This relates to the sustainability pillar of pension systems. An increasing share of GDP devoted to pensions, especially in aging societies, creates structural fiscal stress and reflects lower intergenerational equity (EC, 2023; International Monetary Fund [IMF], 2019). Pension systems face profound sustainability challenges as population ageing intensifies fiscal pressures and undermines intergenerational equity. A broad body of research confirms the systemic nature of this risk. Bongaarts (2004) highlights that population ageing has raised substantial concerns regarding the long-term viability of public pension systems, noting that the median age in developed countries is projected to increase from approximately 29 to 45 years by 2050. Similarly, Zaidi (2012) emphasizes that gains in life expectancy combined with persistently low fertility rates are expanding elderly cohorts while simultaneously shrinking the working-age population that finances pension systems. The literature provides particularly strong evidence of the growing fiscal strain. Hüttl et al. (2015) show that government expenditure has increasingly shifted toward pensioners, often at the expense of younger generations, thereby exacerbating intergenerational imbalances. From a broader welfare-state perspective, Esping-Andersen and Myles (2006) argue that ensuring long-term sustainability requires more than adjusting the balance between employment and retirement. Instead, it also demands a fair distribution of the additional financial burden that population ageing inevitably generates across generations.

H4: Pension expenditure as a percentage of GDP in Slovenia increased more rapidly than the EU average, signalling rising fiscal pressure.

The support ratio is in long-term decline

In PAYG systems, current workers fund current pensions. As the support ratio declines due to aging and labour market shifts, the system's solvency becomes increasingly challenged (Barr, 2006; Holzmann & Hinz, 2005). PAYG pension systems face mounting solvency challenges as demographic transitions reduce support ratios and intensify financial pressure. A substantial body of literature highlights these systemic strains. Bongaarts (2004) argues that population ageing has become a central concern for public pension sustainability, as rising old-age de-

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pendency ratios place increasing burdens on working-age populations. Similarly, Corbo (2004) demonstrate that growing population dependency ratios translate directly into expanding deficits within PAYG pension schemes. Uthoff (2002) further emphasizes that the long-term decline in the number of active contributors relative to beneficiaries is a key factor undermining PAYG system's solvency. Importantly, this evidence is robust across different regional and institutional contexts, consistently indicating that demographic change poses a fundamental challenge to the financial stability of the traditional PAYG model. At the same time, Barr (2006) cautions against framing these developments as an inevitable crisis, suggesting instead that PAYG systems retain scope for adaptive reforms capable of restoring long-term sustainability.

H5: The ratio of active contributors to pension beneficiaries in Slovenia dropped below 1.5 in the observed period, raising concerns about the system's solvency.

3 Results

H1: The net replacement rate (average pension as a share of average wage) in Slovenia declined between 1991 and 2025, suggesting a decrease in pension adequacy.

The results obtained from regression analysis (Table 4) show that there is a significant decrease in the share of minimum pensions over time with respect to average gross wage rates in Slovenia (β =-0.466, p = 0.005). Thus, it can be concluded that the level of adequacy of minimum pensions is deteriorating. The evidence presented in this section provides only partial support to hypothesis H1 since it refers to the decrease in the adequacy of minimum pensions rather than the net replacement ratio based on average pensions. Nevertheless, the obtained result confirms hypothesis H1. The result is consistent with previous international findings (Jgerenaia & Ghaniashvili, 2024; Urbano et al., 2021), underscoring concerns that the pension system increasingly fails to protect minimum income levels in old age.

Table 4. *Linear regression of the minimum pension as a share of the average gross wage*

Metric	Value
R	0.466
R Square	0.218
Adjusted R Square	0.194
Standardized Beta (Year)	−0.466
Unstandardized B (Year)	−0.000
t-value (Year)	−3.029
p-value (Year)	0.005
F-value	9.173
p-value (F-test)	0.005

H2: Minimum pensions in Slovenia have not grown in line with GDP per capita, indicating that the retirees' relative income has not kept up with the overall economic development.

The correlation analysis shown in Table 5 reveals an extremely strong and statistically significant positive correlation between GDP per capita (Indicator 9) and minimum pensions

(Indicator 11) ($r = 0.994$; $p < 0.01$). These results indicate that the minimum pensions increase along with the economic growth in absolute numbers. Nevertheless, the main problem posed in H2 is related to relative economic growth, and hence, Indicator 12 (minimum pension as a share of the average gross wage) should be used. Based on our data we conclude that: there is a negative correlation between Indicator 12 and GDP (Indicator 8) ($r = -0.358$; $p < 0.05$), there is a negative correlation between Indicator 12 and the average gross wages (Indicator 10) ($r = -0.402$; $p < 0.05$). These negative correlations reveal the fact that even though minimum pensions (Indicator 11) increase, they do not follow the pace of the economic growth and wage change. In addition, a negative, but statistically insignificant ($p = 0.060$) relationship between GDP per capita (Indicator 9) and Indicator 12 can be seen ($r = -0.321$), which still supports the same trend.

Table 5. *Pearson Correlation*

		9	10	11	12	13	14	15
8	Pearson Correlation	,998**	,993**	,996**	-,358*	-,544**	-,631**	,979**
	Sig. (2-tailed)	,000	,000	,000	,035	,001	,000	,000
	N	35	35	35	35	35	35	35
9	Pearson Correlation	1	,985**	,994**	-,321	-,565**	-,589**	,967**
	Sig. (2-tailed)		,000	,000	,060	,000	,000	,000
	N		35	35	35	35	35	35
10	Pearson Correlation		1	,993**	-,402*	-,483**	-,695**	,990**
	Sig. (2-tailed)			,000	,017	,003	,000	,000
	N			35	35	35	35	35
11	Pearson Correlation			1	-,343*	-,512**	-,650**	,977**
	Sig. (2-tailed)				,044	,002	,000	,000
	N				35	35	35	35
12	Pearson Correlation				1	-,105	,770**	-,462**
	Sig. (2-tailed)					,547	,000	,005
	N					35	35	35
13	Pearson Correlation					1	,018	-,481**
	Sig. (2-tailed)						,918	,003
	N						35	35
14	Pearson Correlation						1	-,745**
	Sig. (2-tailed)							,000
	N							35

*** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).*

The result (Table 6) supports Hypothesis H2 and confirms the weakening redistributive function of the pension system in the post-transition era. This trend aligns with international findings by Kolsrud et al. (2024) and Riekhoff and Järnefelt (2018), who also documented widening disparities in pension adequacy relative to national income benchmarks. While nominal pension levels track economic growth, relative indicators consistently point to a deterioration in the income position of minimum pension recipients, highlighting a weakening redistributive role of the pension system.

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Table 6. *T test Minimum pension as a share of the average gross wage*

One-Sample Statistics					
	N	Mean	Std. Deviation	Std. Error Mean	
12	35	,1471	,0606	,0102	
One-Sample Test					
Test Value = 0.40					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference
					Lower / Upper
12	-24,700	34	,000	-,2529	-,2737 / -,2321

H3: The minimum pension in Slovenia has remained below 40% of the average gross wage, failing to meet the adequacy thresholds recommended by international standards.

From the one-sample t-test (Table 7), the mean value of Indicator 12, which represents the proportion between the minimum pension and the average gross wage, is equal to 0.147, considerably lower than the expected value (reference value) of 0.40. The difference is significant ($t = -24.700$, $p < 0.001$) and the mean difference equals −0.253. In addition, from the 95% confidence interval [−0.274, −0.232], it can be seen that the real value is far from the reference point.

Table 7. *Linear Regression Results for Pension Expenditure as a Percentage of GDP (Slovenia vs EU-27, 2012–2023)*

Metric	Slovenia	EU-27
R	0.879	0.534
R Square	0.773	0.285
Adjusted R Square	0.750	0.214
Standardized Beta (Year)	−0.879	−0.534
Unstandardized B (Year)	−0,173	−0,055
t-value (Year)	−5.836	−1.999
p-value (Year)	0.000	0.074
F-value	34.058	3.995
p-value (F-test)	0.000	0.074

Thus, it can be concluded that in Slovenia, minimum pensions are considerably lower than 40% of the average wage. Therefore, low pension adequacy may be observed. The above conclusion proves the validity of hypothesis H3, according to which minimum pensions in Slovenia are considerably lower than 40% of the average gross wage. These findings align with ILO (2021) and EU (2024) principles, which suggest that benefits below 40% of the average income are insufficient to ensure basic economic security in old age.

H4: Pension expenditure as a percentage of GDP in Slovenia increased more rapidly than the EU average, signalling rising fiscal pressure.

As per the regression analysis (see Table 7), there are different trends in the case of pension expenditure as a percentage of GDP in Slovenia versus the EU-27 during the period from 2012 to 2023. Specifically, there is a statistically significant trend towards a reduction in the indicator of pension expenditure (Indicator 13) in the case of Slovenia. The average rate of decrease is 0.173 percentage points per year ($B = -0.173$, $p < 0.001$). The explanatory power of the model is rather high ($R^2 = 0.773$).

As for the EU-27, there is a negative trend which, however, is statistically insignificant ($B = -0.055$, $p = 0.074$). Moreover, the explanatory power of the model in this case is much lower than in the previous one ($R^2 = 0.285$). This indicates that there is a slight trend towards decline; however, there is no statistical basis for asserting so.

It should be emphasized that even though the analysis reveals certain differences, it cannot be used to verify statistically that the trends in Slovenia and the EU are statistically significant. Thus, the empirical study does not confirm Hypothesis H4, and contrary to the expectations, the pension expenditure has been declining steadily in Slovenia compared to the EU.

H5: The ratio of active contributors to pension beneficiaries in Slovenia dropped below 1.5 in the observed period, raising concerns about the system's solvency.

In the one-sample t-test (Table 8), it is seen that the mean support ratio in Slovenia is equal to 1.639, thus exceeding the critical ratio by 1.5 units. Such a difference is statistically significant at $t = 5.550$, $p < 0.001$, with the mean difference of 0.139. In addition, the 95% Confidence Interval (0.088, 0.190) demonstrates that the population mean is significantly more than 1.5.

Table 8. *One-sample t-test of the support ratio in Slovenia (benchmark = 1.5)*

One-Sample Statistics						
	N	Mean	Std. Deviation	Std. Error Mean		
5	35	1,639	,1483	,0251		
One-Sample Test						
Test Value = 1.5						
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
5	5,550	34	,000	,1391	,0882	,1901

The findings show that the average support ratio in Slovenia remains significantly above the critical threshold of 1.5, indicating that the system has not yet reached the level associated with increased fiscal pressure. Accordingly, Hypothesis H5 is rejected ($t = 5.550$, $p < 0.001$).

4 Discussion

The findings of this study provide a consistent empirical validation of key theoretical frameworks in pension economics, particularly the tension between adequacy and sustainability in PAYG systems. By explicitly testing the hypotheses derived from established theory, the results offer a structured interpretation of the pension system dynamics in Slovenia.

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First, the results related to H1 confirm a statistically significant decline in the relative level of minimum pensions over time, indicating a deterioration in pension adequacy. This finding is consistent with OECD (2025) and Eurostat (2025b) frameworks, which identify the replacement rate as a central indicator of adequacy. The observed downward trend supports previous empirical studies (Jgerenaia & Ghaniashvili, 2024; Urbano et al., 2021), suggesting that pension systems increasingly struggle to maintain pre-retirement living standards, particularly for lower-income groups.

Second, the results of H2 further reinforce this conclusion by showing that minimum pensions have not kept pace with GDP per capita and wage growth in relative terms. While strong positive correlations confirm that pensions increase in absolute terms, negative correlations with relative indicators demonstrate a weakening redistributive function. This directly challenges the life-cycle income hypothesis (Modigliani, 1986), which assumes proportional consumption smoothing over the life course. The Slovenian evidence instead aligns with more recent findings (Kolsrud et al., 2024; Riekhoff & Järnefelt, 2018), indicating that retirement often entails unequal and declining consumption outcomes.

Third, the confirmation of H3 provides additional evidence of inadequate minimum income protection. The one-sample t-test shows that minimum pensions remain significantly below the commonly referenced threshold of 40% of the average wage, consistent with international social protection standards (ILO, 2021; EU, 2024). This finding highlights a structural weakness in the pension system's ability to prevent old-age poverty.

In contrast, the results related to sustainability provide a more nuanced picture. Hypothesis H4 is rejected, as pension expenditure in Slovenia has declined relative to GDP and has not increased more rapidly than the EU average. This contradicts standard expectations derived from demographic theory, which predict a rising fiscal pressure due to population ageing (Barr, 2006; Holzmann & Hinz, 2005). The Slovenian case therefore supports the argument that institutional design and policy reforms can offset demographic pressures, at least in the medium term (EC, 2021).

Similarly, Hypothesis H5 is rejected, as the support ratio, although declining, remains statistically above the critical threshold of 1.5. This suggests that the system has not yet entered a phase of acute financial instability. However, the long-term downward trend remains consistent with theoretical expectations regarding PAYG systems under demographic ageing (Bongaarts, 2004; Uthoff, 2002).

Taken together, the results clearly demonstrate a structural trade-off between adequacy and sustainability. While Slovenia has successfully maintained fiscal stability—through declining pension expenditure relative to GDP and a still-sufficient support ratio—this has been achieved at the cost of declining pension adequacy, particularly among minimum pension recipients. This confirms that pension systems are not neutral redistributive mechanisms, but reflect policy choices that balance efficiency and equity (Barr, 2006).

From the policy perspective, the findings suggest that the current model prioritizes fiscal discipline over social adequacy. While this approach has prevented short-term fiscal imbalances, it raises concerns about long-term social sustainability and the risk of increasing old-age inequality. A more balanced reform approach would therefore be required to align the Slovenian pension system with both theoretical principles and international policy standards.

5 Conclusion

In the presented research, the authors have made an attempt to conduct a thorough assessment of dynamics of the pension system in Slovenia. In particular, the researchers have considered the connection between demographic changes, economic growth, and institutions that govern the process of pension payments.

The results confirm that in terms of fiscal sustainability, Slovenia can be regarded as one of the countries in which it is achieved due to the reduction of pension expenses in comparison to GDP and the support ratio remaining at acceptable levels.

However, despite the positive tendency to sustain fiscal sustainability, pension adequacy experiences deterioration, as it appears that pensions do not increase proportionally to the growth of wages and GDP per capita. The mentioned finding supports the idea that the tendency towards decreased pension adequacy becomes widespread on the global scale, as indicated by international sources (OECD, 2025; Urbano et al., 2021), since a decline in the replacement rate is observed in many pension systems.

Thus, the research disproves the life-cycle income hypothesis put forward by Modigliani (1986), as it does not allow concluding that the process of proportional consumption smoothing occurs in real life.

Implications of the findings are notable. Since there is an observed decrease in the share of pensions in GDP, there may be fiscal space to enhance minimum pension adequacy without jeopardizing its sustainability. Following the advice of international institutions (EC, 2021; ILO, 2021), further changes should concentrate on improving minimum income security, working longer, and developing additional pension pillars.

To conclude, the case of Slovenia highlights that pension system sustainability should not be estimated exclusively by financial factors. It should also maintain a delicate balance between ensuring fiscal solvency and adequate income security in response to demographic changes and other developments within the labour market.

Data availability statement

The data used in this study are available from the authors upon reasonable request.

Coauthor contributions

Andrej Raspor: Conceptualization of the study, Development of the theoretical framework, Formulation of the research hypotheses, Methodology development, Statistical analysis, Interpretation of results, Drafting of the original manuscript, Revisions during the peer-review process, Final approval of the submitted version

Bojan Macuh: Research design, Data acquisition, Database preparation, Contribution to empirical validation, Descriptive analysis, Review and substantive comments on the manuscript

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References

Agency for Statistics of Bosnia and Herzegovina. (2025). *Average monthly net earnings*. Agency for Statistics of Bosnia and Herzegovina. https://bhas.gov.ba/Calendar/Category?id=13&lang=en&page=15&stat

Barr, N. (2006). Pensions: overview of the issues. *Oxford Review of Economic Policy*, *22*(1), 1–14. https://doi.org/10.1093/oxrep/grj001

Bongaarts, J. (2004). Population aging and the rising cost of public pensions. *Population and Development Review*, *30*(1), 1–23. https://doi.org/10.1111/j.1728-4457.2004.00001.x

Chen, Y., Zhao, L., Fan, Y., & Xie, B. (2021). Does the New Rural Pension Scheme improve residents' livelihoods? Empirical evidence from Northwestern China. *PLOS ONE*, *16*(4), e0250130. https://doi.org/10.1371/journal.pone.0250130

Corbo, V. (2004). Policy challenges of population aging and pension systems in Latin America. In *Global demographic change: Economic impacts and policy challenges* (pp. 257–280). Federal Reserve Bank of Kansas City. https://www.kansascityfed.org/documents/3396/PDF-Corbo2004.pdf

Esping-Andersen, G., & Myles, J. (2006). Sustainable and equitable retirement in a life course perspective. In G. L. Clark, A. H. Munnell, & J. M. Orszag (Eds.), *The Oxford handbook of pensions and retirement income*. Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199272464.003.0042

European Commission. (2021). *The 2021 ageing report: economic and budgetary projections for the EU member states (2019–2070)*. Publications Office of the European Union. https://economy-finance.ec.europa.eu/publications/2021-ageing-report-economic-and-budgetary-projections-eu-member-states-2019-2070_en

European Commission. (2023). *2024 ageing report: underlying assumptions and projection methodologies*. https://doi.org/10.2765/960576

European Union. (2024). *Social Protection Committee annual report 2024: Review of the Social Protection Performance Monitor (SPPM) and developments in social protection policies*. Publications Office of the European Union. https://employment-social-affairs.ec.europa.eu/social-protection-committee-annual-report-2024-review-social-protection-performance-monitor-sppm-and_en

Eurostat. (2025a). *Annual net earnings* [Data set]. https://doi.org/10.2908/earn_nt_net

Eurostat. (2025b). *Social inclusion: employment and social inclusion indicators*. https://ec.europa.eu/eurostat/web/employment-and-social-inclusion-indicators/social-protection-and-inclusion/pension

Eurostat. (2025c). *Expenditure on pensions as percentage of GDP* [Data set]. https://doi.org/10.2908/tps00103

Figari, F., Matsaganis, M., & Sutherland, H. (2013). Are European social safety nets tight enough? Coverage and adequacy of minimum income schemes in 14 EU countries. *International Journal of Social Welfare*, *22*(1), 3–14. https://doi.org/10.1111/j.1468-2397.2012.00885.x

Gorlin, Y. M., Lyashok, V. Y., & Salmina, A. A. (2020). Koefitsient zameshcheniya kak instrument analiza i prognozirovaniya pensionnoy sistemy. *Voprosy Ekonomiki*, *12*, 80–103. https://doi.org/10.32609/0042-8736-2020-12-80-103

Holzmann, R., & Hinz, R. (2005). *Old-age income support in the 21st century: an international perspective on pension systems and reform*. World Bank. https://openknowledge.worldbank.org/

Hüttl, P., Wilson, K., & Wolff, G. B. (2015). *The growing intergenerational divide in Europe*. Bruegel. https://www.bruegel.org/policy-brief/growing-intergenerational-divide-europe

International Labour Organization. (2021). *World Social Protection Report 2020–22: social protection at the crossroads – in pursuit of a better future*. https://www.ilo.org/wcmsp5/groups/public/@ed_protect/@soc_sec/documents/publication/wcms_817572.pdf

International Monetary Fund. (2019). *Fiscal monitor, October 2019: how to mitigate climate change*. https://www.imf.org/en/publications/fm/issues/2019/10/16/fiscal-monitor-october-2019-how-to-mitigate-climate-change-47027

Jappelli, T. (2005). The life-cycle hypothesis, fiscal policy and social security. *BNL Quarterly Review*, *58*(233–234), 173–186.

Jgerenaia, E., & Ghaniashvili, M. (2024). Fife Years After Reform: assessing the adequacy of the pension system in Georgia and EU countries. *European Scientific Journal, ESJ*, *20*(28), 1. https://doi.org/10.19044/esj.2024.v20n28p1

Kolsrud, J., Landais, C., Reck, D., & Spinnewijn, J. (2024). Retirement consumption and pension design. *American Economic Review*, *114*(1), 89–133. https://doi.org/10.1257/aer.20221426

Le Garrec, G. (2012). Social security, income inequality and growth. *Journal of Pension Economics and Finance*, *11*(1), 53–70. https://doi.org/10.1017/S1474747211000229

Modigliani, F. (1986). Life cycle, individual thrift, and the wealth of nations. *Science*, *234*(4777), 704–712. https://doi.org/10.1126/science.234.4777.704

OECD. (2025). *Pensions at a glance 2025: OECD and G20 indicators*. OECD Publishing. https://doi.org/10.1787/e40274c1-en

Ortiz, I., Behrendt, C., Acuña-Ulate, A., & Anh, N. Q. (2018). Universal Basic Income proposals in light of ILO standards: key issues and global costing. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3208737

Penne, T., Cornelis, I., & Storms, B. (2020). All we need is… reference budgets as an EU policy indicator to assess the adequacy of minimum income protection. *Social Indicators Research*, *147*(3), 991–1013. https://doi.org/10.1007/s11205-019-02181-1

Rakic, S. (2024). Average salaries in countries of ex-Yugoslavia – how does Serbia fare?. *Serbian Monitor*. https://www.serbianmonitor.com/en/average-salaries-in-countries-of-ex-yugoslavia-how-does-serbia-fare/

Riekhoff, A. J., & Järnefelt, N. (2018). Retirement trajectories and income redistribution through the pension system in Finland. *Social Forces*, *97*(1), 27–54. https://doi.org/10.1093/sf/soy028

Statistical Office of Montenegro. (2025). *Average wages without taxes and contributions (NET) by activity sector*. MONSTAT. https://monstat.org/eng/page.php?id=1270&pageid=24

Statistical Office of the Republic of Serbia. (2025). *Average annual earnings* [Data set]. Data Dissemination Database. https://data.stat.gov.rs/Home/Result/2403040409?languageCode=en-US

Statistical Office of the Republic of Slovenia. (2025). *Statistični podatki o pokojninah in staranju prebivalstva* [Data set]. SiStat Database. https://www.stat.si/statweb

Urbano, B., Jurado, A., & Rosado-Cebrián, B. (2021). What will retirement pensions be like? Analysis of Spanish future pensioner households in terms of poverty. *Sustainability*, *13*(4), 1760. https://doi.org/10.3390/su13041760

Uthoff, A. (2002). Labour markets and pension systems. *CEPAL Review*, *78*, 39–52. https://doi.org/10.18356/bcd8cd58-en

Vlada Republike Slovenije. (2025). *Pokojninska reforma*. GOV.SI. https://www.gov.si/zbirke/projekti-in-programi/reforma-pokojninskega-sistema/

Yanatma, S. (2025). Pension income across Europe: which countries offer the highest pensions?. *Euronews*. https://www.euronews.com/business/2025/12/20/pension-income-across-europe-which-countries-offer-the-highest-pensions

Zaidi, A. (2012). Population aging and financial and social sustainability challenges of pension systems in Europe: a cross-national perspective. In L. Bovenberg, C. van Ewijk, & E. Westerhout (Eds.), *The future of multi-pillar pensions* (pp. 17–45). Cambridge University Press. https://doi.org/10.1017/CBO9781139136143.004

Zavod za pokojninsko in invalidsko zavarovanje Slovenije. (2025). *Statistični podatki o pokojninah in staranju prebivalstva* [Data set]. ZPIZ. https://www.zpiz.si/cms/?ids=content2019&inf=1195#x1

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