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An Ex-Ante Assessment of the Proposal to Reform the Second Pillar of the Lithuanian Pension System

Occasional Paper Series

No 57 / 2025

Occasional Paper Series
No 57 / 2025
ISSN 2424-3213 (online)

An Ex-Ante Assessment of the Proposal to Reform the Second Pillar of the Lithuanian Pension System

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Abstract

This document offers an ex-ante assessment of the proposal to allow the withdrawal of funds from the second pillar of the Lithuanian pension system. First, we use a quantitative macroeconomic model to quantify, under alternative scenarios, the potential impact that the withdrawal of Pillar II funds might have on the economy in the medium term. Second, we offer a long-term view of the current pension replacement rates and the consequences that the withdrawal of funds might have for those individuals who decide to opt-out of Pillar II.

Executive summary

This report evaluates the potential impact of allowing withdrawals from Lithuania's Pillar II pension system. The analysis examines both medium-term macroeconomic effects and long-term consequences on pension replacement rates.

The macroeconomic assessment indicates that if 40% of Pillar II participants withdrew their funds primarily for consumption, the economy would experience significant short-term fluctuations. Real GDP growth and inflation would initially increase in 2026, followed by a drop below baseline forecast levels in 2027 as consumption normalizes. While these distortions would increase economic volatility in the short term, both GDP and inflation would eventually return to pre-policy trends by the end of 2028.

The long-term outlook for pension adequacy presents more concerning findings. Lithuania's replacement rates are already below European averages and are projected to decline further due to significant demographic challenges. Population decline and aging negatively impact the pay-as-you-go Pillar I system, while Pillar II helps stabilize long-term replacement rates. Withdrawals from Pillar II would push average replacement rates closer to the lower Pillar I levels, with low-income individuals disproportionately affected.

To counteract declining replacement rates, Lithuania would need either substantial employment increases or higher Pillar I insurance tax rates. The adjustments required to achieve a current level of around 50% replacement rate in the long run would be significant, and reaching the OECD's recommended 70% target would demand even greater changes. The report concludes that long-term policy intervention is necessary, requiring a credible combination of approaches addressing both demographic challenges and efficient utilization of Pillar I reserves.

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1. Introduction

The Ministry of Social Security and Labor (*Socialinės apsaugos ir darbo ministerija*, SADM) announced a policy proposal to reform the second pillar of the pension accumulation system. The proposed changes "*aim to increase the attractiveness and flexibility of the system, ensure voluntary participation of participants and employer participation, balance financial incentives and implement the Constitutional Court ruling by providing options to withdraw from accumulation in the second pillar of pensions when accumulation becomes difficult or pointless*".[1]

The objective of this paper is to provide an ex-ante assessment of the proposed change to allow Pillar II participants to opt-out of the system and withdraw the value of the pension funds from their individual contributions and investment gains. The analysis focuses on two dimensions. On the one hand, we assess the potential macroeconomic consequences that the withdrawal of funds could have on the economy. On the other hand, we quantify the impact on the future pensions of retirees.

To do so, we proceed as follows. First, we characterize the current system and summarize the changes proposed by the government. Second, we review the evidence from the Estonian Pillar II reform in 2021 and contrast the Estonian context with the current situation in Lithuania. Third, we use a quantitative macroeconomic model to assess the impact that the withdrawal of funds could have on key aggregate variables such as GDP and inflation. Finally, we conduct a scenario analysis of pension replacement rates in Lithuania in the long run.

[1] https://socmin.lrv.lt/lt/naujienos/pristatyti-siulymai-kaip-pertvarkyti-antraja-pensiju-pakopa-didesnis-lankstumas-ir-kaupimo-patrauklumas/

2. The institutional setting

In this section, we present the Lithuanian pension system, which consists of three pillars, and describe the details of the proposed changes to the second pillar of the system.

2.1. Current pension system

Since 2004, the Lithuanian pension system has consisted of three pillars: Pillar I (state pension), Pillar II (quasi-mandatory pension fund savings), and Pillar III (voluntary supplementary pension funds savings). Below, we discuss the details of Pillars I and II, which form the basis of the national pension system.

The first pillar of the Lithuanian pension system is managed by the Social Security System (SODRA) and operates on a pay-as-you-go (PAYG) basis, i.e., it relies on contributions from the working population to finance current pensions. As a result, its sustainability depends on the balance between workers and pensioners. Currently, social security contributions related to the pension system amount to 8.72% of individual monthly wages or income. The value of the Pillar I pension consists of two components:

Basic pension part: This is determined by the person's acquired pension social insurance period and the basic pension amount in the year of retirement. It is indexed annually based on economic and wage growth. A full year of pension social insurance is earned when contributions equal at least 12 times the minimum monthly wage for that year. If contributions are lower, a proportional period is credited. The required period for an old-age pension will be 34 years in 2025 and will increase by six months annually until reaching 35 years in 2027.

Individual pension part: This is based on the number of pension accounting units (points) a person accumulates and their value at retirement. The value of these units is indexed annually. One full point is earned when contributions equal 12 times the average wage for that year determined by the government prior to the start of the new year.[2] In 2025, the average wage was set at 2,108.88 Euros. When an individual earns less than this average wage, a proportional number of points is awarded. Similarly, higher-income individuals can collect more than one point per year, but the maximum number of points that can be collected is equal to 5. Importantly, the average wage set by the government tends to fall below the salary of the average worker, which implies that this average worker collects more than one point per year (2024 Ageing Report Lithuania).[3]

The second pillar of the Lithuanian pension system is a quasi-mandatory pension funds' saving model managed by private companies. This scheme was first introduced in January 2004. However, the system has experienced continuous changes, with contribution amounts adjusted 13 times over 20 years. Initially, citizens were given the option to either contribute solely to the state pension system or redirect a portion of their Pillar I contributions to the second pension

[2] The Government set the average wage for 2025 on December 10, 2024. See: https://e-seimas.lrs.lt/portal/legalAct/lt/TAD/233e9c40b70511efbb3fe9794b4a33e2?jfwid=-laib92qxz

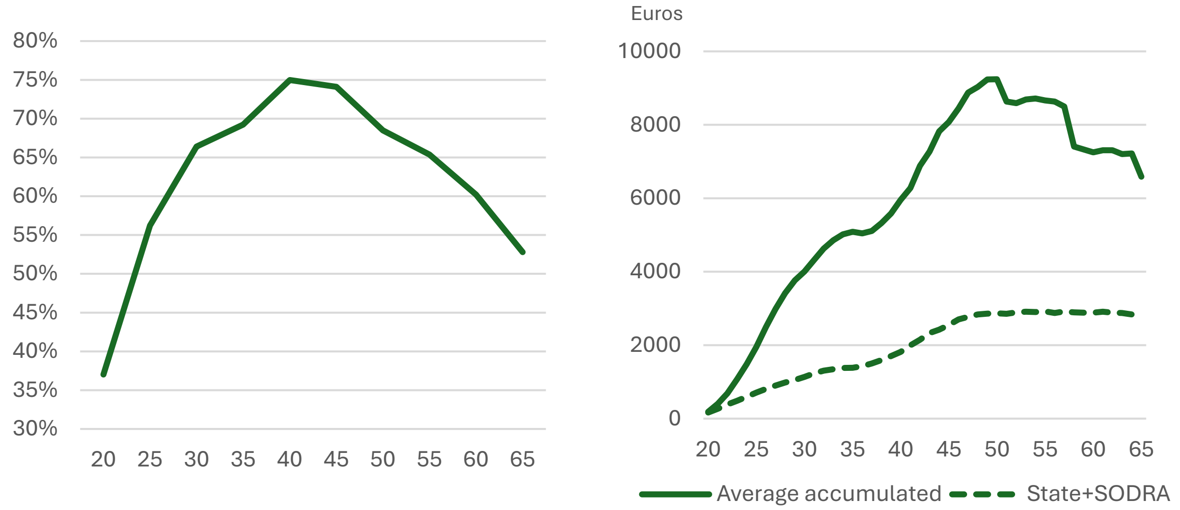
[3] For example, the average wage in the fourth quarter of 2024 was 2,335.9 Euros, 1.11 times higher than the average set by the government to calculate pension points. See: https://osp.stat.gov.lt/pagrindiniai-salies-rodikliai

pillar. This choice meant receiving a lower pension from Pillar I but supplementing it with savings accumulated in private pension funds. The plan was to gradually increase the share of Pillar I contributions directed to private pension funds from 2.5% to 5.5%. However, due to the economic recession in late 2009, this share was reduced to 2%, and despite subsequent reforms, the originally intended accumulation level was never reached. In 2014, a state incentive for pension accumulation was introduced to encourage greater participation in the second pillar and provide more opportunities for individuals to make additional contributions toward their old-age pension.

In 2019, significant changes were made to the participation conditions of the second pillar of the pension system and a one-off opting-out option was offered. The reform eliminated the transfer of Pillar I contributions to second-pillar pension funds. A new life-cycle pension fund system was also introduced, due to low independent retirement savings and passive fund selection, to optimize long-term investment returns while managing risk levels. The system also introduced automatic enrollment for employees younger than 40.[4] In addition, contributions were unified to 3% of the participant's salary and 1.5% of the national average salary as a supplementary contribution paid for the participant from the state budget.

Figure1. Pillar II participation rates and average amounts by age.

(A) Participation rates *(B) Average accumulated amounts*



Source: SODRA and own calculations.
Note: The figure shows, for different age groups as of 2025, Pillar II participation rates (Panel (A)) and average accumulated funds together with the value of SODRA transfers State contributions (Panel (b)).

According to SODRA data, around 60% of the working population is actively participating in the second pillar in 2024. An additional 10% of the population has funds in the second pillar but suspended their contributions when it became possible to do so in 2019. Participation rates vary significantly by age group. For example, the participation rate is below 50% for those under 25, while it is over 70% for those between 25 and 55 (see Figure 1, Panel (A)). The value of contributions to the system amounts to 6.31 billion Euros, and 43.6% of these contributions reflect purely individual contributions, i.e., they do not correspond to SODRA transfers before

[4] All employees under the age of 40 are enrolled with the right to opt-out within a certain period (6 months); the auto-enrollment process is repeated every 3 years. Older employees can join the scheme on a voluntary basis. There are no other restrictions on participation other than being covered by SODRA pension scheme and being below the legal retirement age.

2019 or the state subsidy afterward. In terms of total value, the latest data, referring to February 28, 2025, show that the value of Pillar II funds is about 9.21 billion Euros (or about 11% of GDP), with significant investment gains of almost 3 billion Euros (see the Lithuanian Pension Pillar II: Analysis and Research 2025 for more information on the evolution of returns in the past). The average amount of Pillar II funds also varies considerably by age (Figure 1, Panel (B)), as does the portion of the average for each group that is transferred to Pillar I in the event of withdrawal (dashed line).

2.2. Proposed reform of Pillar II

We now describe the details of the Ministry of Social Security and Labor's (SADM) proposal for changes to Pillar II. Note that in this document, we are evaluating the proposal, not the final reform. The objective of the changes is to increase its attractiveness and flexibility, to ensure voluntary participation by participants and employers, to balance financial incentives, and to allow for the possibility of withdrawing from the second pillar when accumulation becomes difficult or irrelevant. The proposed changes are listed below.

1. Move to a voluntary model by abandoning the automatic enrollment of individuals in the Pillar II system and introducing a model that provides public information about the possibilities of accumulating in the Pillar II system, along with a permanent invitation to voluntarily join the system.
2. Flexibility in choosing the size of the contribution to the system and the possibility of stopping them if needed. The proposal is to allow either to choose the standard 3% contribution, to increase it comfortably, and if the financial situation worsens, to suspend contributions. Contributions could be suspended for one year with the possibility of extending this period. Contributions could be increased indefinitely, with the possibility of reversing this decision.
3. More flexible options for withdrawing all or part of the accumulated funds.
    a. Allow a one-time withdrawal of up to 25% of accumulated funds and allow full withdrawal less than 5 years before retirement age for those who have accumulated small amounts (less than 50% needed for the annuity). The withdrawal would be subject to a 3% tax to cover administrative costs.
    b. Allow for withdrawal when saving has become difficult due to a loss of 70-100% participation, a serious disease on the list of diseases established by the Ministry of Health, or the need for palliative care has been identified.
    c. Once the retirement age is reached, withdrawal of 25% of funds will be possible if this right has not been exercised before the old-age retirement age.
4. Allow opting out of the Pillar II system within a 21-month window.
    a. Participants will be able to either withdraw or transform into SODRA retirement points the share of the funds that represent individual contributions together with all the investment gains (61.3% of Pillar II funds).
    b. The share of funds that represent state contributions or pre-2019 SODRA transfers will be transferred to SODRA in the form of pension points. The cost of the accounting unit would be set in proportion to the current pension insurance rate for the average earnings set by the government.
5. Optional inclusion of employers in second pillar pension provision. Employers can benefit from a corporate tax deduction for the additional contributions. Employers' contributions may also be provided for in collective agreements.

3. Lessons from the Estonian experience

Estonia implemented a reform of its Pillar II pension system in 2021. In this section, we describe the system and the reform and contrast the Estonian situation with that of Lithuania to highlight the potential insights that the Estonian experience can offer on the consequences of the proposed Lithuanian policy change.

3.1. Estonian Pillar II pension system reform

The Estonian second pillar of the pension system was introduced in 2002. The system was compulsory for all cohorts born after 1983, and it was not possible to opt-out, while older cohorts had the option to choose. By 2021, about 75% of the population was included in the system (see Meriküll, 2024, for details).

In Estonia, contributions to Pillar II included two components. On the one hand, 2% of workers' gross wages was transferred to the system. On the other hand, for those in the system, 4% of the pension insurance tax into Social Security was deducted from the pay-as-you-go first pillar and transferred to the second pillar.[5]

In 2019, the government decided to start the reverse of Pillar II using, among other arguments, the poor performance of private pension funds. The implementation of the reform took place two years later, in 2021, when participation in the second pillar became voluntary, and participants were allowed to withdraw their accumulated pension savings in three rounds over a year. The conditions were that withdrawal had to be for the full amount accumulated, with the possibility to choose when to withdraw during the year. The amount withdrawn was subject to a 20% personal income tax. Moreover, the decision to withdraw meant that the participant could not participate in the second pillar for the following ten years. Before the reform in 2021, the value of Pillar II funds was 5.3 billion Euros or about 19% of the GDP.

The first round of withdrawals took place in September 2021. Most of the withdrawals occurred in the very first round when 20% of the participants (150,000 people) decided to leave the system, and the funds withdrawn amounted to 1.34 billion Euros.[6] After taxes, the net amount deposited in leavers' bank accounts was about 1 billion Euros, which was equivalent to about 70% of the average monthly disposable income and 87% of the average monthly consumption of the Estonian household sector before the reform.

The rate of withdrawal was similar between those younger cohorts who were forced to be in the system and those who joined voluntarily in 2002. However, Meriküll (2024) documented that households with a higher marginal propensity to consume were more likely to withdraw their pension savings and that the probability of withdrawal generally declined with income. In other words, low-income individuals with a higher propensity to consume had higher withdrawal rates.

The Estonian Ministry of Finance asked two of the largest Estonian banks, Swedbank and LHV, to analyze the use of the withdrawn funds between September and December 2021. These two banks received and analyzed about 70% of the total amount withdrawn. They quantified that 25%

[5] This contribution system resembled the Lithuanian system before the 2019 reform, i.e., contributions were relocated from the first pillar to the second pillar.

[6] The withdrawal rate in the next two rounds was of 12 thousand participants in January 2022 and 23 thousand in May 2022. In 2023, the number of people withdrawing their pension savings became smaller than the number of new entrants, and the number of participants began to grow again (Meriküll, 2024).

of the amount was directly consumed, another 7% was withdrawn in cash, 13% was used to repay loans, and 16% was transferred (plausibly also for loan repayments). Finally, 26% of the amount was still in current accounts at the end of 2021. Moreover, Meriküll (2024) estimated the impact of the withdrawal on inflation using consumer price data (HICP). The analysis indicates that the consumption boost from the withdrawal contributed to keeping inflation one percentage point higher relative to the inflation level in Lithuania and Latvia for up to four quarters following the reform.

3.2. The Lithuanian context vs the Estonian experience

How informative the Estonian experience is for the ex-ante assessment of the Lithuanian proposal to reform Pillar II depends on the macroeconomic context when the reforms take place as well as the characteristics of the population in the system.

Table 1 shows the macroeconomic context of Estonia one quarter before the reform was implemented (2021Q3) and the situation of Lithuania in the same quarter as well as the current situation, i.e. 2025Q1. The table highlights the similar situation of Estonia and Lithuania in 2021, which suggests that both countries and their experiences are likely to be comparable if the situation is similar. However, when comparing 2021 and 2025, it becomes clear that the current economic environment is quite different. For example, while both Estonia and Lithuania recovered from the pandemic shock with nominal GDP growth rates of around 13%, the current situation in Lithuania, despite noticeable growth, points to slower rates that are likely to remain at similar levels in the short term according to recent forecasts (see the latest Lithuanian Economic Review (2025Q1) for more details). HICP inflation was also higher in 2021 than today, in line with the slower nominal GDP growth. The level of unemployment differs between Estonia and Lithuania in 2021, 5.8% and 6.9% respectively. Notably, the unemployment rate in Lithuania in 2025 remains similar to its level in 2021. Finally, and relevant for understanding the potential impact of allowing Pillar II participants to withdraw money, the average household debt level in Lithuania is eight percentage points lower than in Estonia in 2021 (40 vs. 32% as a share of nominal GDP), and in 2025 Lithuania has a slightly lower debt level of around 28.5%. In a similar fashion, the current ECB rate might indicate that the incentives to save are currently higher than in 2021.

Table 1. Macroeconomic situation

	Estonia (2021Q3)	Lithuania (2021Q3)	Lithuania (2025Q1)
HICP (YoY)	5.4%	5.2%	3.0%
Nominal GDP growth rate (YoY)	13.4%	13.0%	7.3%
Unemployment rate	5.8%	6.9%	6.5%
Average Household Debt-to-Nominal-GDP	40%	32%	28.5%
ECB Rate	0%	0%	2.5%

Source: ECB, CEIC, and own calculations.

Beyond differences in the macroeconomic environment, individual heterogeneity also matters for the potential effects that would arise if the policy proposal were ultimately implemented. For example, Meriküll (2024) documents that in the case of Estonia, the withdrawals were mainly concentrated among households with high marginal propensities to consume (MPC), which amplified the impact of the reform on consumption and led to excess inflation.

To characterize marginal propensities to consume as well as the type of workers who are in the system and compared to Estonia, we exploit the fourth wave of the Household Consumption and Finance Survey (HFCS) that refers to the year 2021. We define the share of "hand-to-mouth" (H2M) or constrained individuals following the existing literature (see, for instance, Kaplan, 2014). These individuals are those whose liquid wealth, i.e., liquid financial assets (savings, deposits, bonds, stocks, cash, etc.) minus debt, is equal or less than half of their annual earnings. In addition, to compute marginal propensities to consume (MPC), we rely on the following HFCS question as done in previous literature using the same data (see Drescher, 2020): "*Imagine you unexpectedly receive money from a lottery, equal to the amount of the income your household receives in a month. What percent would you spend over the next 12 months on goods and services, as opposed to any amount you would save for later or use to repay loans?"*. The share of money that a given household would devote to consumption represents the MPC, and we obtain the MPC in Lithuania as the average of MPCs across households.

Table 2 shows the share of constrained individuals and the marginal propensities to consume for Lithuanian and Estonian households in 2021. The figures reveal some important differences between households in the two countries. The share of constrained individuals (or hand-to-mouth, H2M) is much larger in Lithuania, accounting for almost half of HFCS respondents, while it is only a third in Estonia. The average Pillar II participation rate revealed by the HFCS data also suggests important differences, with higher rates in Estonia, probably due to the mandatory nature of the system for a non-negligible part of the population, as discussed in Section 3.1. Marginal propensities to consume (MPCs) also differ between the two countries, with Lithuanian households responding in the survey that they would spend a higher proportion of a lottery income shock on consumption than Estonian households.

Taken together, the comparison between Estonia and Lithuania suggests that the consequences of Pillar II withdrawal in Lithuania will depend mainly on three key issues that differ significantly between the current context in Lithuania and the Estonian situation in 2021. First, household debt in Lithuania is currently lower than in Estonia, where about 13% of the withdrawn funds were explicitly used to repay consumer loans within a quarter after the withdrawal. This difference in debt levels may imply that the average Lithuanian household could allocate a higher share of the funds to either consumption or savings. In this respect, it is plausible that the consumption response is higher in Lithuania not only because of the lower average household debt, but, more importantly, because the country has a higher marginal propensity to consume compared to Estonia, as indicated by estimates obtained using the same data and methodology. Thus, given that the available data suggest that Estonian households used 30-40% of the withdrawn funds for consumption purposes within a quarter, one might expect Lithuanian households to spend 50-60% of the funds from Pillar II. Importantly, the current ECB interest rate of 3% vs. 0% in 2021 might imply that Lithuanian households opting out of Pillar II might reduce their consumption and allocate a relatively higher share of the withdrawn funds to savings, given the currently higher returns. However, the pattern of interest rate cuts observed in recent months may suggest that the dampening effect that the incentives to save due to current interest rates can have on the consumption response is disappearing.

Table 2. Share of constrained individuals and MPC

	Estonia (2021)	Lithuania (2021)
H2M Households	0.3631	0.4953
Population age (H2M)	42.40 (40.64)	45.75 (44.29)
Participation in Pillar II (H2M)	0.8084 (0.4048)	0.4996 (0.5514)
Share of Pillar II funds held by H2M	0.3273	0.5467
Average MPC	0.3854	0.5716
MPC among Pillar II participants	0.3768	0.5694
MPC among H2M households	0.4394	0.5685
MPC among H2M households in Pillar II	0.4299	0.5687
MPC among H2M households in Pillar II younger than 30	0.4210	0.4475

Source: HFCS and own calculations.

4. The potential impact of withdrawing funds from Pillar II on the economy

In this section, we provide an ex-ante assessment of the potential aggregate effects of allowing individuals to opt-out of the Pillar II system and withdraw their individual contributions on key macroeconomic statistics. For this purpose, we use a general equilibrium model and implement alternative scenarios determined by the size of the shock that can hit the economy depending on the share of individuals who withdraw Pillar II funds. We first introduce the key ingredients of the model we rely on and then provide a discussion of the macroeconomic impact that the withdrawal might have based on our modeling assumptions.

4.1. Quantitative models and evaluation

We evaluate the broader macroeconomic effects of various withdrawal scenarios that might emerge during the proposed 12-month window to opt-out of the Pillar II system. Our primary model is LITMAS, an in-house DSGE model of the Lithuanian economy that includes several real and nominal frictions. Among other features, the model includes two types of households. On the one hand, constrained households (H2M), who spend all their available income or, in other words, have a marginal propensity to consume (MPC) of 1. On the other hand, unconstrained households, who spend a portion of their income and save the rest. In the model, unconstrained individuals have an MPC of 0.57, as indicated by HFCS findings.

To evaluate the aggregate impact of the withdrawal of Pillar II funds, we proceed as follows. First, we define the share of funds that will be withdrawn by constrained and unconstrained individuals relying on information from HFCS discussed in Section 3.2. In the model, constrained individuals have MPC equal to 1, while the microdata suggests a lower one. To accommodate these differences and let the model replicate the average MPC in the economy, we assume that 28% of individuals in the model will behave as constrained, i.e., will consume everything they withdraw. Given that this group of households has a slightly higher share of funds in Pillar II (54,67% according to Table 2), we allocate to them 30% of the funds in the model. The remaining amount of money coming from the withdrawal will be allocated to unconstrained households that will consume 57% and save the rest, according to their MPC. For all the scenarios (based on the share of people withdrawing), we keep constant the proportion of funds withdrawn by constrained and unconstrained households, so the differences across scenarios on the macroeconomic impact just depend on the size of the shock.

We assess three different scenarios for varying sizes of Pillar II withdrawals for individual purposes rather than transfer to Pillar I. These scenarios are based on 20%, 40%, and 60% of participants opt-out from Pillar II and take the funds out of the pension system. The current value of Pillar II funds is 9.21 billion Euros, according to the most recent data. Based on SODRA data, the share of funds that reflect purely individual contributions is 2.75 billion Euros. Moreover, the policy proposal indicates that participants will be allowed to withdraw investment gains, which represent 2.90 billion Euros. As there is so far no clear decision on the taxation for the money that would be withdrawn, we consider the gross value will go to the individuals. Therefore, the maximum gross value that can flow into the economy would be 5.65 billion Euros. Based on this amount, we create the following scenarios:

- Scenario 1: If 60% of participants withdraw, a total amount of 3.39 billion Euros would flow into the economy, and 2.37 billion Euros would be allocated for consumption purposes
- Scenario 2: If 40% of participants withdraw, a total amount of 2.26 billion Euros would flow into the economy, and 1.58 billion Euros would be allocated for consumption purposes[7]
- Scenario 3: If 20% of participants withdraw, a total amount of 1.13 billion Euros would flow into the economy, and 0.79 billion Euros would be allocated for consumption purposes

For each of these scenarios, we calculate how much the increase in consumption represents relative to the forecast for 2026Q1.[8] Then, we use this value to identify shocks to the households' budget constraint that would be equivalent to the amount of money that would flow into the economy. In each scenario, the shock is assumed to hit the economy in 2026Q1 and is spread over two quarters. Notice that if individuals withdraw at different rates over the time window offered by the government, the size of the shock will be smaller, and so will the response of the macroeconomic variables. However, the Estonian experience shows that most of the individuals who decided to withdraw from the system did so at the first opportunity they had. For our analysis, we assume that unconstrained households increase their consumption level by 50% in both Q1 and Q2 of 2026, while constrained households increase their consumption by 75% in Q1 and 25% in Q2. We quantify the impact of these shocks on key macroeconomic variables in the model, such as GDP and inflation. Once we have the simulated macroeconomic effects, we combine these estimates with the LB baseline forecasts to assess how the withdrawal of funds will affect the economy relative to the no-policy-change scenario from 2026Q1 to 2027Q4.

4.2. The aggregate consequences

Equipped with our estimates, we now turn to quantify the macroeconomic implications of the selected scenarios of Pillar II withdrawals on the economy. Figure 2 shows the impact on the level of quarterly real GDP, real imports, real consumption, all expressed in billion Euros, and HICP inflation, expressed as annualized quarterly percentages, between 2025Q4 and 2027Q4. The figures clearly show that the macroeconomic impact of the withdrawal depends on the size of the shock or, in other words, on the share of Pillar II participants who decide to withdraw funds. In the figure, we report the baseline forecast (dashed black line) along with the three scenarios discussed above.

Panel C of Figure 2 offers a visualization of the modeled consumption response and the implications for real GDP and inflation (Panel A and B, respectively). In the 40% withdrawal scenario, 1.58 billion Euros are allocated for consumption. As discussed above, the figure shows that most of the increase in consumption occurs in 2026Q1, but a non-negligible portion of the withdrawn funds is deferred for consumption in 2026Q2, keeping consumption elevated relative to the baseline forecast for two quarters. After these two quarters, consumption converges back

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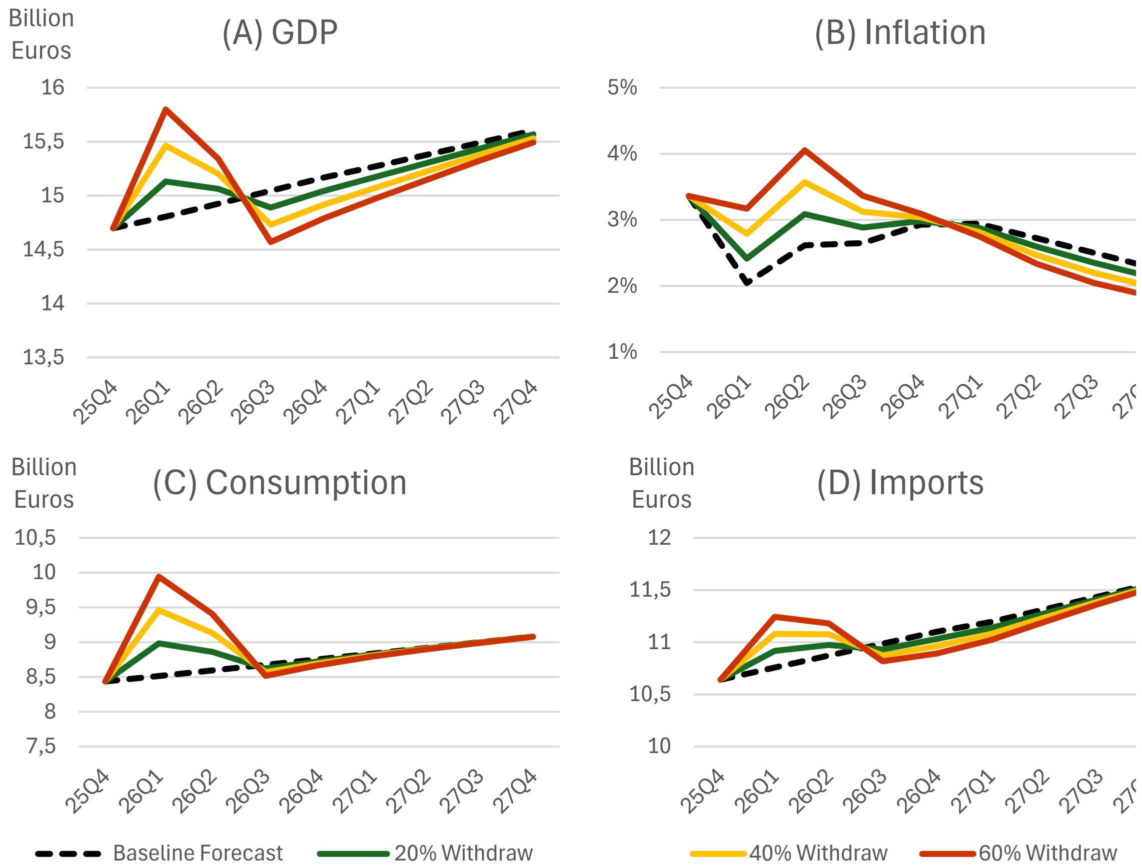
[7] This scenario is consistent with a recent survey that suggest 4 out of 10 individuals would like to opt-out from Pillar II.

[8] See the Lithuanian Economic Review (2025Q1) for more details on the macroeconomic forecast of the Lithuanian economy for the next three years.

to the forecast level but remains slightly below trend in the second half of 2026 due to households' intertemporal decision to consume more at the beginning of the year. Importantly, the consumption boost has broader macroeconomic implications. For example, in the 40% withdrawal scenario, following the increase in real consumption, real GDP increases in 2026Q1 by 0.66 billion Euros and by 0.28 billion Euros in 2026Q2. The increase in real consumption does not translate one-to-one to real GDP, because, among other things, the trade balance is also affected because of the change in imports.

Figure 2. Macroeconomic impacts



Source: SODRA, LB projections data, and own calculations from the LITMAS DSGE model.
Note: The figure shows the combination of model-simulated responses to Pillar II funds withdrawal scenarios and LB projections of four key macroeconomic variables. The withdrawn funds are assumed to hit the economy in the first and second quarters of 2026 in the form of a consumption shock. Panel A shows quarterly real GDP in billion Euros. Panel B shows quarterly annualized HICP inflation. Panel C shows quarterly real consumption in billion Euros. Panel D shows quarterly real imports in billion Euros.

Regardless of the size of the shock, Figure 2 shows how the increase in GDP (Panel A) is driven by the increase in demand, as the withdrawal of funds results in higher disposable income for households. The higher disposable income and the associated consumption response can be clearly seen in Panel C, where the size of the response is dependent on the amount of funds that will flow into the economy. The consumption needs cannot be fully met by the domestic economy due to short-term capacity constraints, which implies that imports will also increase (Panel D). Importantly, this increase in consumption has both direct and indirect effects on inflation. On the one hand, higher product demand puts upward pressure on local consumer prices (HICP). On the other hand, as firms need to hire more workers to meet the increased product demand (goods and services), wages rise. Thus, both higher consumption and higher wages push up consumer prices, resulting in a higher inflation rate than forecasted (Panel B).[9]

After the initial expansion, the additional disposable income from the withdrawal of funds has been used to frontload consumption, and this extra source of income is no longer available to households after 2026Q2. Because wages and prices are rigid, GDP falls below its trend. This decline is the consequence of two forces. On the one hand, given that the initial shock increased consumer prices, which do not adjust instantaneously, households lower their demand in this price environment. On the other hand, as product demand weakens, firms seek to adjust capacity. However, as wages are downward rigid, the adjustment comes through lower labor demand. Both forces reinforce each other, explaining the fall in real GDP right after the initial shock. This adjustment has obvious implications for inflation dynamics, as price growth is below the baseline forecast while the economy is below its trend. However, as nominal variables adjust and demand stabilizes, the economy bounces back to the forecasted level.

The observed dynamics of the selected macroeconomic variables highlight both the role of intertemporal choices of households and firms as well as rigidities in the transmission of the shock through the economy. Importantly, these channels also explain why, despite the temporary nature of the income shock, its effects on GDP and inflation are still observed until 2027Q4, as they slow down the adjustment.

In Table 3, we present our results for real GDP and inflation in the form of annualized growth rates. Panel A shows the LB baseline forecasts of GDP and inflation for 2026 and 2027. These figures indicate a steady GDP growth of 3% per year for 2026 and 2027, while inflation is projected to be 2.6%. Focusing on the 40% withdrawal scenario (Panel C), the table shows that this shock size implies an increase of 0.7 percentage points (pp) in real GDP growth in 2026 relative to the baseline forecast, while annual GDP growth is 1.5 pp lower in 2027. The inflation rate is 0.5pp higher in 2026 and 0.2pp lower in 2027 relative to the baseline forecast. Note that the slowdown in GDP is the result of two forces. On the one hand, the economic adjustment discussed above causes real GDP to fall below trend (Panel A in Figure 2). On the other hand, the annual growth rate in 2027 is also affected by a higher real GDP in 2026 relative to the level in the baseline forecast. Panels B and D show the numbers for the 20% and 60% scenarios, where the dynamics of real GDP is the same but the magnitude of the deviations from the forecast is dependent on the amount of money flowing into the economy.

The fluctuation in annual growth rates indicates that the withdrawal of funds will translate into higher macroeconomic volatility, as indicated by the deviations in annualized growth rates relative to the baseline forecast. However, when considering annualized average growth rates for the whole period, i.e., between 2025 and 2027, the results indicate the real GDP growth would be 0.2pp lower by 2027 in the 40% withdrawal scenario relative to the baseline forecast. Alternatively, if we compute the real GDP growth and inflation between 2025Q4 and 2027Q4, the baseline forecast implies that quarterly real GDP will grow 6.2% while this figure is 5.7% in the 40% withdrawal scenario. Because real GDP is lower, inflation will also be below the baseline forecast in the medium term, as the economy adjusts as explained above.

[9] Demand pressures significantly increase inflation because firms operate under Calvo pricing: those able to adjust prices will do so in response to increased demand, leading to an increase in the overall price level. Inflation expectations play a role, as forward-looking consumers anticipate rising prices and adjust their spending patterns accordingly.

Finally, as suggested by Figure 2, while the temporary income shock will be felt in the economy for more than two quarters, i.e., the period during which consumption increases, real GDP and inflation will return to their trend if and only if the policy change has not distorted the trend that the macroeconomy was forecasted to follow before the withdrawal of Pillar II funds. Under the assumption that the pre-policy trend remains unchanged by the shock, we calculate that both real GDP and inflation would be back at their forecasted levels by the end of 2028 (between Q3 and Q4).

Table 3. Growth rates of macroeconomic variables

	Year	GDP	Inflation
A. Baseline Forecast	2025 - 26	3,0%	2,6%
	2026 - 27	3,0%	2,6%
	2025 - 27	3,0%	2,6%
B. 20% Withdraw	2025 - 26	3,4%	2,8%
	2026 - 27	2,3%	2,5%
	2025 - 27	2,9%	2,5%
C. 40% Withdraw	2025 - 26	3,7%	3,1%
	2026 - 27	1,5%	2,4%
	2025 - 27	2,8%	2,5%
D. 60% Withdraw	2025 - 26	4,0%	3,4%
	2026 - 27	0,7%	2,2%
	2025 - 27	2,7%	2,4%

Note: This table presents the growth rates of two macroeconomic variables—real GDP and inflation—for the LB baseline forecast and three withdrawal scenarios. For each scenario, the first two lines display annual growth rates, while the third line (labeled "2025-27") shows the average annual growth rate calculated from the last quarter of each year over a two-year period. Annual growth rates are determined by summing the values of all four quarters each year and calculating the percentage change compared to the sum of the same quarters in the previous year.

5. Analysis of replacement rates under current system and proposed new system

We now turn to offer an assessment of the current pension system in terms of future pension replacement rates along with the implications of the policy proposals. We proceed as follows. First, we introduce our strategy to estimate long-run replacement rates. Second, we discuss the results of our strategy and show how the withdrawal will affect the replacement rates of the population. Finally, we quantify the needs in terms of increasing employment or tax-insurance pension rates to compensate for falling replacement rates.

5.1. Modeling cohort-specific replacement rates at retirement

The 2025-2070 scenarios for replacement rates of *the average worker* are based on a life-cycle approach for cohorts, along with economy-wide projections for wage and population dynamics. The starting point is the official formula to determine the value of the pension at retirement time. Importantly, our modeling strategy focuses on individuals and thus implicitly assumes that the collected entitlements can be paid by the system. We also abstract from the existence of Social Security reserves that could increase replacement rates by increasing the value of the Pillar I pension beyond the indexation strategy or from the possibility that the government will transfer resources to the system by using tax revenues. Under this assumption, the individual value of the pension is given by

$$\text{Pension Value} = \text{Pillar I} + \text{Pillar II}$$

$$= \text{Flat component} + \text{Earnings} - \text{related component} + \text{Pillar II}$$

$$= \frac{\text{CY}}{\text{MY}} \times \text{B} + \text{U} \times \text{V} + \frac{(0.03 \times \text{w} + 0.015 \times \text{W}) \times (1 + \text{r})^{\text{CY}}}{20}$$

where **CY** refers to actual contribution years, **MY** stands for minimum contribution years to qualify for full pension. **B** is the general pension (or basic) part of Pillar I SODRA pension, and **V** is the value of SODRA points that determine the individual, or earnings-related, part of the Pillar I pension value, while **U** refers to the accumulated SODRA units, which is a function of the contribution years and the ratio between the individual wages, **w**, and the Government set average wage, **G**. Note that the formula implies that if the average individual contributes more years than the required minimum, the lump-sum component of the pension value will increase proportionately. Similarly, if the individual's average salary is higher than the Government set average salary, the earnings-related component will also be higher because the SODRA units will increase.[10] For Pillar II annuities, we calculate the value of the funds and divide them equally over the retirement period. The contributions depend on individual wages as well as **W,** which is the economy-wide average wage that the government uses for the subsidy. **r** represents the interest rate in investment funds. The denominator in Pillar II annuity is the difference between retirement

[10] See the SODRA website for more details on how the Pillar I pension value is determined: https://www.sodra.lt/kaip-apskaiciuojama-pensijos-verte?lang=lt

age (65) and expected life expectancy (85), which determines for how many years the pensioner will receive payments from the fund.

We use this formula to project the value of the pension of the average worker within a given cohort at retirement age. We create the value at retirement at different horizons based on insights from life-cycle models, i.e., wages grow faster at the beginning of workers' careers, along with projections of aggregate variables such as economy-wide wages, government-set wages, and the wage bill in the economy. Full details about the assumptions for each variable in the pension value equation are provided in Appendix A.

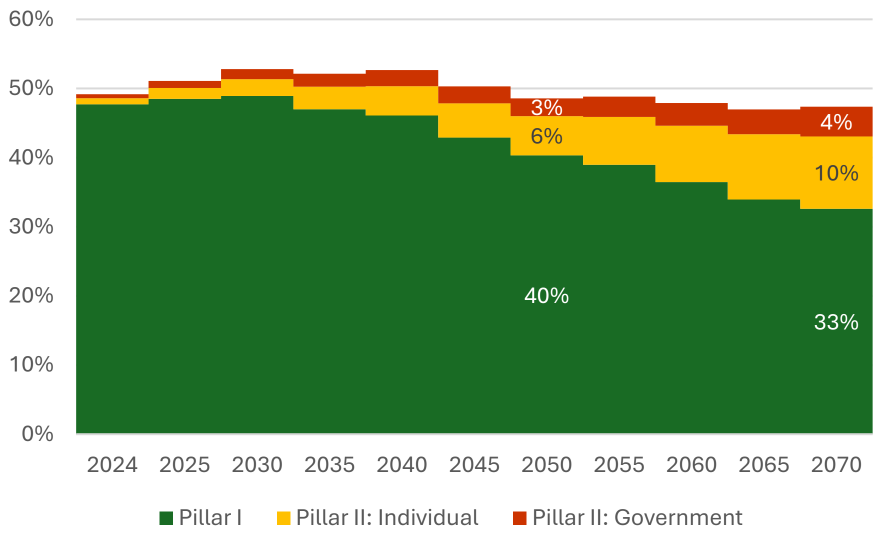
5.2. Replacement rates from Pillar I and II under different withdrawal scenarios

To compute replacement rates, we first calculate the pension value at retirement age according to the formula defined above. Once we have the pension value, we calculate net replacement rates for each cohort as the ratio of the pension value to the net wage of the individual at retirement age, i.e., the projected salary of each cohort when they reach the legal retirement age.[11] We decompose the replacement rate for each cohort into three components: Pillar I, Pillar II individual part, and Pillar II government subsidy.

We begin our discussion by presenting replacement rates based on our life-cycle modeling strategy (Figure 3), which uses population projections from the Lithuanian National Audit Office (up to 2050) and Eurostat's long-term projections (up to 2070) adjusted by the deviation of these series from the most recent short-term population projections. The figure indicates that all else equal, the replacement rate for a person who is only in the first pillar of the pension system will be 40% by 2050 (33% by 2070). This declining pattern is a consequence of population decline, as population shrinking affects negatively the growth of the wage bill, and, thus, the growth of the components of Pillar I. Consistent with previous estimates, our results indicate that Pillar II payments help to offset the decline in Pillar I replacement rates. In particular, the figure indicates that for an individual who is both in Pillar I and II, the replacement rate will be 49% (47%) in 2050 (2070). This 9pp (14pp) higher replacement rate in 2050 (2070) comes from both the individual contributions, 6pp (10pp), and the government subsidy, 3pp (4pp). Importantly, the current level of replacement rates is low compared to other European economies, where Lithuania stands out as one of the countries with lower replacement rates (see Eurostat aggregate pension replacement ratio for EU comparisons) and well below OECD recommendations, which suggest that the level for adequate replacement rates should be around 70% of pre-retirement earnings.

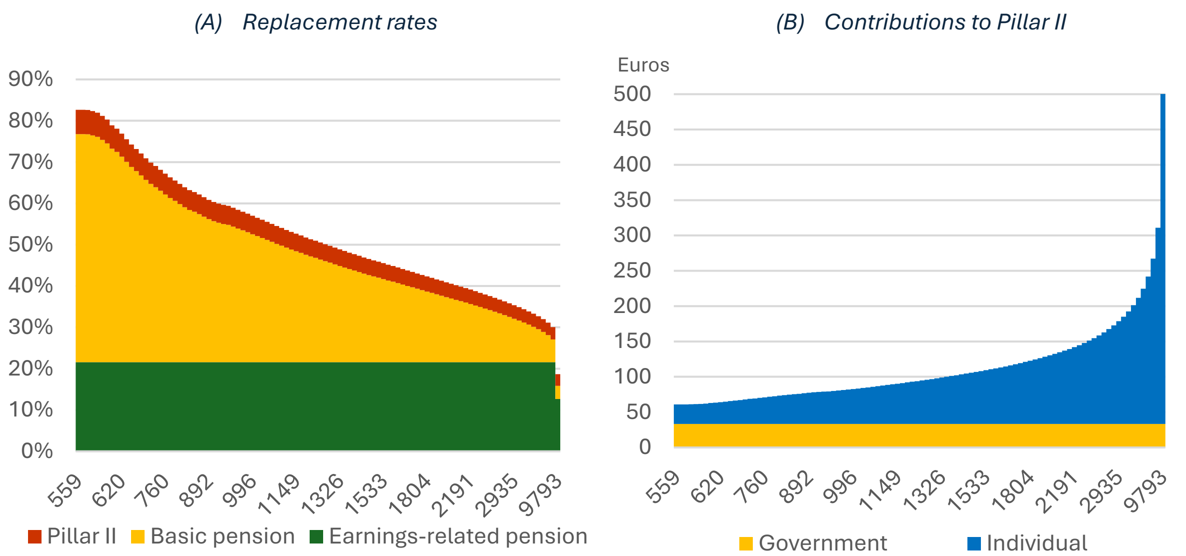
[11] We assume that when the individuals reach the legal retirement age, they have already satisfied the minimum contribution years. In our assumptions, the projections point to the average individual contributing more than the minimum, in line with current data.

Figure 3. Projections of replacement rates for Pillar I and Pillar II



Source: SODRA, Statistics Lithuania, Eurostat, and own calculations from the model in Section 5.1.
Note: The figure shows, for each retirement cohort, a decomposition of replacement rates into Pillar I, individual contributions to Pillar II, and government contributions to Pillar II.

Figure 4. Replacement rates and Pillar II contributions for all net wage percentiles in 2024



Source: SODRA and own calculations from the model in Section 5.1.
Note: Panel (A) shows the replacement rates of the pension system by percentiles of net monthly labor income in 2024, distinguishing between Pillar II and the basic and earnings-related part of Pillar I. Panel (B) shows the value in 2024 Euros of Pillar II contributions coming from individual wages and from the State subsidy.

However, it is important to keep in mind that falling replacement rates, as well as the policy proposal, will affect individuals differently simply because they have different income levels. This is clearly shown in Figure 4, where we plot replacement rates (Panel (A)) and Pillar II contributions (Panel (B)) for different percentiles of the net monthly earnings distribution in 2024. The figure holds all elements of the pension value formula constant except for individual wages, which makes it possible to assess the income heterogeneity of replacement rates. Importantly, individuals at different points of the distribution will also have different career patterns, which can also affect replacement rates. For example, some individuals may experience more spells of unemployment, which will reduce the number of years of contributions and, hence, the value of their pension. Abstracting from this career pattern dimension, Figure 4 helps to emphasize that the projected fall of Pillar I replacement rates due to population decline will affect relatively more low-income individuals. Moreover, when considering Pillar II, these individuals will also lose relatively more if they withdraw from Pillar II or if just the government subsidy is removed without alternative support, as the government subsidy is particularly important. For example, for a minimum wage worker, the government subsidy is equal to their contribution to Pillar I.

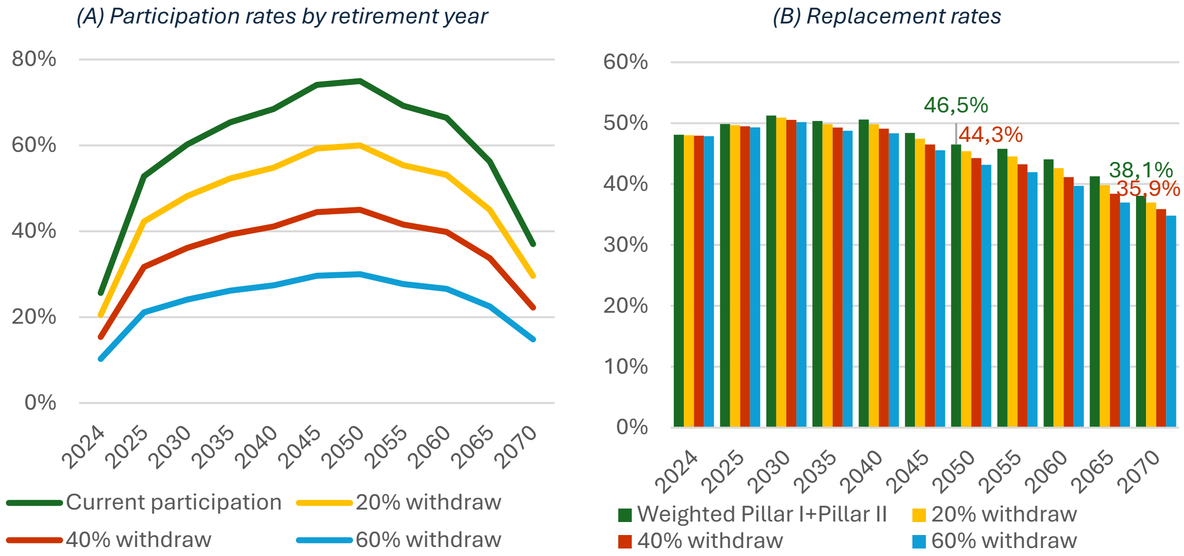
In the remainder of the analysis, to assess the impact of the policy proposal on the replacement rate, we will use a weighted average between the replacement rate for individuals only in Pillar I and individuals in both Pillar I and II. To construct this weighted average for each cohort, we rely on the age-specific participation rates we have shown in Section 2.1.

In Panel (A) of Figure 5, we show current participation rates in Pillar II by retirement year, together with the resulting participation rates from different withdrawal scenarios. In Panel (B) of Figure 5, we report the current replacement rates that would be in the population once we consider the current Pillar II participation rates (weighted RR Pillar I + Pillar II bar) as well as the resulting weighted replacement rates under alternative withdrawal scenarios: 20%, 40%, and 60% withdrawal rates among Pillar II participants. For each of these withdrawal scenarios, 38.7% of the funds are transferred to Pillar I in the form of SODRA unit points. Thus, the weighted replacement rates are composed of individuals who are in Pillar I only, individuals who were in Pillar I and Pillar II but decided to withdraw, and individuals who decided to remain in Pillar II. For the proportion of participants in each cohort that we assume will withdraw from Pillar II, we take the 38.7% of accumulated funds in 2025 and convert these values into SODRA points, as implied by the policy proposal. To convert pension funds into SODRA points, we assume that the price of a point is determined by the current tax-insurance pension rate, i.e., 8.72%. Using the average wage set by the government, the value of one unit of SODRA in one year is equal to 2206.73 Euros. The replacement rate is then calculated based on the proportion of individuals in each group.

The weighted replacement rates under different scenarios in Panel (B) of Figure 5 confirm how the replacement rates decline as the withdrawal rate of participants increases. In other words, the fewer people who participate in Pillar II and thus benefit from the additional payments in retirement that come from pension fund returns, the lower the replacement rate observed in the population. This result is purely mechanical, as lower participation rates imply that the weighted replacement rate converges to the one of only Pillar I. What is important is that, while withdrawal rates play a minor role in the replacement rate for older individuals, i.e., those retiring in the next 10 years, they affect relatively more those retiring in 2050 and beyond. The implication of this pattern is that the benefit of buying SODRA points depends on the accumulated funds in Pillar II, and for these younger generations, the size of these accumulated funds is not large enough to buy enough SODRA points to compensate for the lack of return on funds in Pillar II.

In the next part of the analysis, we use the 40% withdrawal scenario to estimate either the number of new employees or the amount of the tax-insurance pension rate needed to compensate for the decline in replacement rates.

Figure 5. Participation rates in Pillar II by retirement year and projections of replacement rates for different withdrawal scenarios



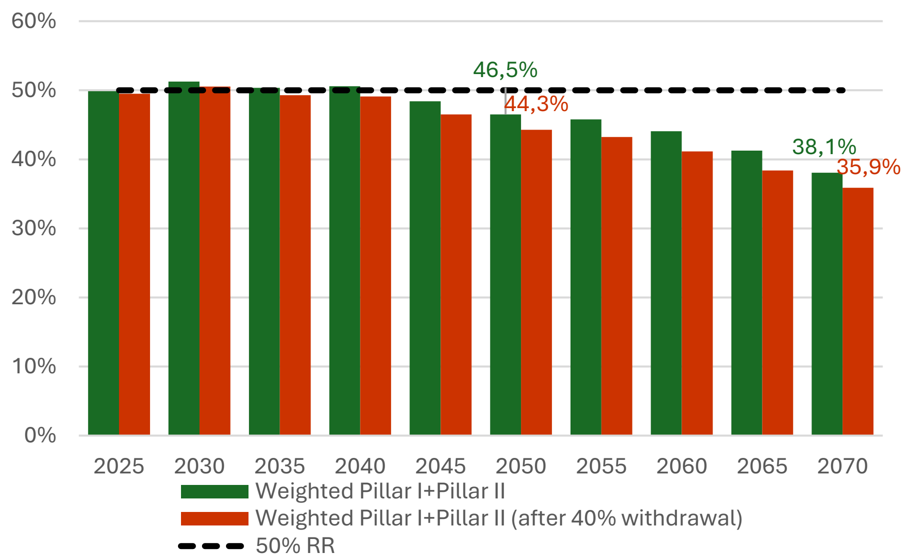
Source: SODRA, Statistics Lithuania, Eurostat and own calculations from the model in Section 5.1.
Note: Panel (A) shows participation rates by cohort-specific retirement year based on current participation rates and participation that would result under alternative withdrawal scenarios, assuming all cohorts withdraw in the same proportion. Panel (B) reports weighted replacement rates based on Pillar I+II participation rates using current participation rates as well as participation rates after each withdrawal scenario.

5.3. Tax and employment rates needed to compensate for Pillar II withdrawal

Figure 6 shows the current weighted replacement rate based on the cohort-specific participation rates and the one resulting from a 40% withdrawal rate of participants in each cohort described above. Based on this level of replacement rates as well as the target of a 50% replacement rate, in this section, we calculate how much the tax-insurance pension rate and the number of employees should increase to make the replacement rate emerging from the 40% withdrawal scenario equivalent either to the pre-policy replacement rate (from the red bar to the green bar) or to 50% (from the red bar to the dashed black line).

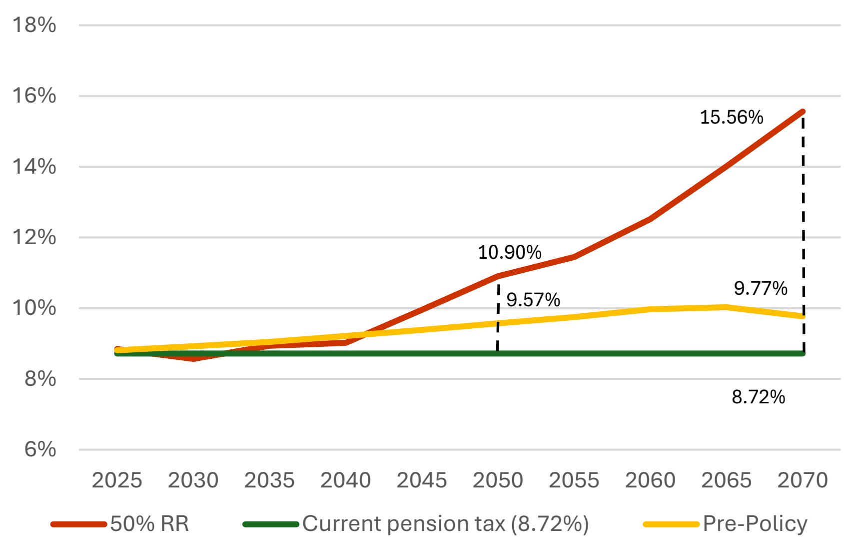
Figure 7 plots the current tax-insurance pension rate (green line) against the requirements to reach both the pre-policy rate (yellow line) and the 50% replacement rate (red line). Not surprisingly, for cohorts retiring in the next few years (up to 2040), there is no need for significant tax increases because the replacement rates for those generations are projected to be close to both the pre-policy replacement rate and the 50% target. However, for cohorts retiring after 2040, the differences begin to widen. On the one hand, as discussed above, for individuals in these cohorts who decide to withdraw, the value of the funds in Pillar II is not as relevant to compensate for the lack of Pillar II. This means, for example, that for the cohort retiring in 2050, for the weighted replacement rate to be equal after the policy change (and under our 40% scenario), the tax-insurance tax rate should be 9.57% compared to the current level of 8.72%. Importantly, the main challenge facing pension systems is the general decline in replacement rates due to population decline and ageing. This is somehow reflected in the fact that for the cohort retiring in 2050 (2070) to have a replacement rate of 50%, the tax insurance rate should be 10.90% (15.56%).

Figure 6. Weighted replacement rates



Source: SODRA, Statistics Lithuania, Eurostat and own calculations from the model in Section 5.1.
Note: The figure shows current replacement rates weighted by current participation rates in Pillar I and II (green bars) and the weighted replacement rates resulting from a scenario where 40% of Pillar II participants withdraw and the SODRA contributions and State subsidy part of the funds are transferred to Pillar I (red bars). The horizontal dashed black line represents a 50% pension replacement rate.

Figure 7. Tax insurance rates needed to reach pre-policy and 50% replacement rates

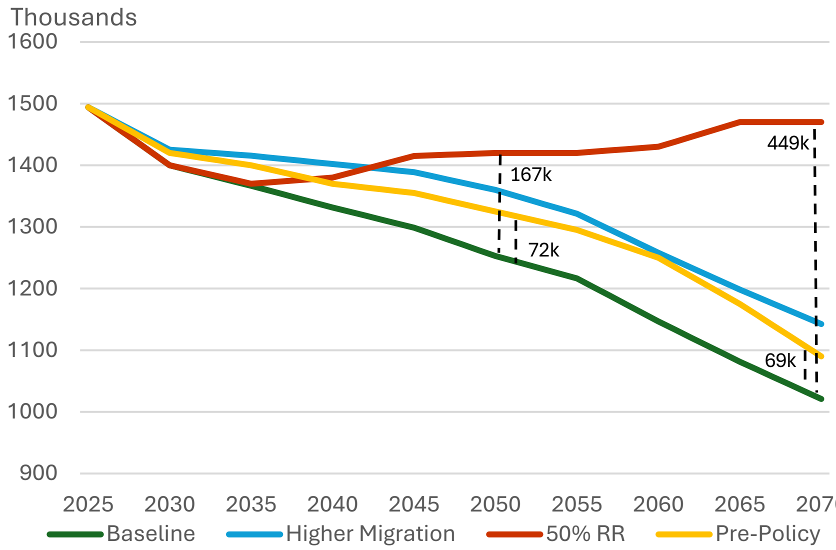


Source: SODRA and own calculations from the model in Section 5.1.
Note: The figure shows the current pension tax rate (green line) as well as the tax rate needed for each cohort-specific retirement year to make the replacement after the 40% withdrawal scenario equal to either the pre-policy change replacement rate (yellow line) or a 50% replacement rate (red line) for each cohort.

We now perform an exercise in which we calculate how many more workers would be needed in the economy to bring the replacement rate that would result if 40% of individuals withdrew from the second pillar to either the pre-policy replacement rate or a targeted replacement rate of 50% of pre-retirement earnings. To do this, we use a similar approach as described above for tax insurance rates and solve for the employment levels that would result in the target replacement rates.

Figure 8 plots baseline employment projections (green line) together with an optimistic scenario of higher migration (turquoise line). In addition, we plot the level of employment that would be needed for the replacement rate after a 40% withdrawal rate to be equal to the pre-policy replacement rate (yellow line), as well as the employment needed to achieve a 50% replacement rate between 2025 and 2070 (red line). As the figure shows, with replacement rates already projected to remain close to 50%, the need for additional workers is low or non-existent until 2035. However, as the population continues to decline and becomes older, additional workers will be needed. Our calculations suggest that the number of workers needed to maintain replacement rates equivalent to the no withdrawal scenario is close to that projected in the higher migration scenario provided by the Lithuanian National Audit Office (turquoise line in the figure), implying an increase of about 70 thousand workers. In other words, if the optimistic projections regarding the arrival of migrants and the return of the Lithuanian diaspora come true, the weighted replacement rate after a scenario of a 40% withdrawal rate from the second pillar would be equivalent to the no-withdrawal scenario. However, the employment needs are much more demanding if one wants to achieve at least a 50% replacement rate for all cohorts. In figures, this additional employment would imply having 167 (449) thousand more workers in 2050 (2070).

Figure 8. Number of employees needed to reach pre-policy and 50% replacement rates



Source: SODRA, NAO, Eurostat, and own calculations from the model in Section 5.1.
Note: The figure shows the current projected employment levels (green line) together with the projected employment levels in an optimistic scenario of higher migration (turquoise line), the employment needs to make the replacement after the 40% withdrawal scenario equal to the pre-policy projected replacement rate (yellow line) or equal to a 50% replacement rate (red line) for each cohort.

6. Conclusions

This report offers an ex-ante assessment of the proposal to allow the withdrawal of funds from the second pillar of the Lithuanian pension system. First, we use a quantitative macroeconomic model to quantify, under alternative scenarios, the potential impact that the flow of withdrawn funds might have on the economy in the medium term. Second, we offer a long-term view on the current pension replacement rates and the consequences that the withdrawal of funds might have for those individuals who decide to opt-out of Pillar II.

The macroeconomic analysis suggests that the possibility of freely withdrawing the individual part of Pillar II funds could have immediate macroeconomic consequences, given that the funds are likely to be channeled into consumption. We quantify that an initial shock from a scenario where 40% of Pillar II participants withdraw will boost real GDP growth and push prices up in 2026 relative to the forecast values by 0.7 and 0.5 percentage points, respectively. After the initial boost, they will fall below the forecast level in 2027 (1.5 and 0.2, respectively) when consumption goes back to normal, and the economy adjusts. Taken together, our results suggest that the initial distortion in the economy will increase volatility over the medium term, as measured by deviations of real GDP growth from its baseline forecast. However, while the temporary shock lasts longer than the two quarters in which the consumption shock occurs, everything else equal, both real GDP and inflation eventually return to their pre-policy trends by the end of 2028.

The scenario analysis of replacement rates paints a more worrying picture. Current replacement rates are already low by European standards and are projected to fall further due to both population decline and ageing. Population dynamics push replacement rates down through their impact on the pay-as-you-go system (Pillar I), while Pillar II helps stabilize replacement rates in the long run. Our analysis suggests that the withdrawal of funds from Pillar II will shift the average replacement rate in the economy closer to that of Pillar I. In addition, we document that demographics and the withdrawal of participants from Pillar II will have a greater negative impact on the replacement rates of low-income individuals, as for this group of workers, the fall in the Pillar I pension value is more salient, and they especially benefit from the government subsidy to Pillar II contributions.

To counteract the long-run decline in replacement rates, we quantify that the Lithuanian economy would have to either significantly increase employment levels or raise the tax rate on Pillar I insurance. In particular, we find that around 70 thousand more workers would be needed, a number that could be achieved if population projections based on an optimistic migration scenario were met. The tax rate would have to increase to around 9.5-10% to achieve pre-policy replacement rates. Importantly, the increases are particularly large to achieve a 50% replacement rate in the long run, and they will be even higher to reach the OECD's proposals for adequate replacement rates, which should be at least 70% of pre-retirement earnings. Therefore, policy action is needed in the long run, and a combination of credible approaches is needed that will address both population dynamics and the efficient use of accumulated Pillar I reserves.

The assessment carried out in this report is by no means exhaustive of all the implications that the policy proposal could have. However, there are several key questions that need to be discussed and ultimately answered. How will the withdrawal affect the Pillar II system? How will those who leave be affected relative to those who remain? How will making Pillar II voluntary affect its relevance for future replacement rates? What is the alternative to Pillar II to achieve an acceptable replacement rate for future retirees?

References

Drescher, K., Fessler, P., & Lindner, P. (2020). Helicopter money in Europe: New evidence on the marginal propensity to consume across European households. Economics Letters, 195, 109416.

Kaplan, G., Violante, G. L., & Weidner, J. (2014). The wealthy hand-to-mouth (No. w20073). National Bureau of Economic Research.

Meriküll, Jaanika (2024). Impact of Second Pension Pillar Withdrawals on Household Finances. *Mimeo.*

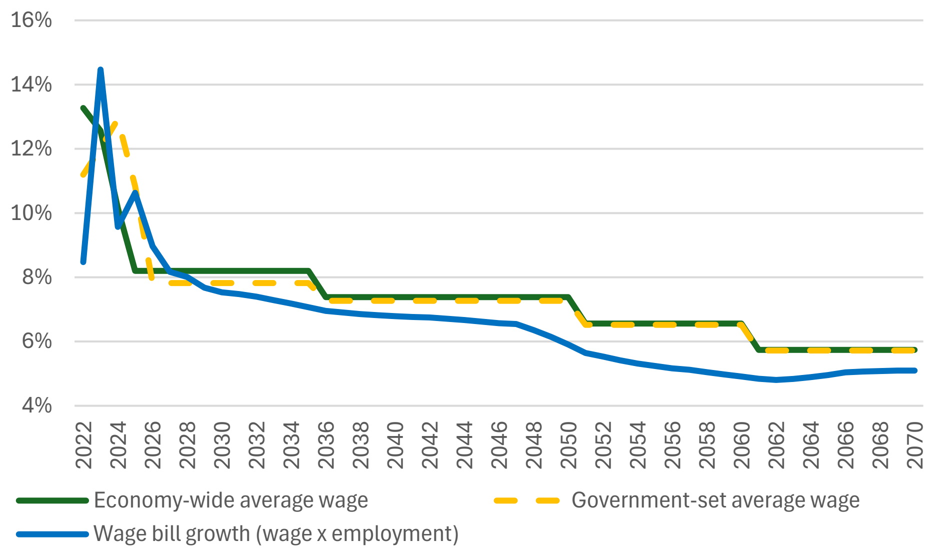
APPENDIX - Assumptions for long-run projections of pension value and replacement rates

To create the value of the pension and corresponding retirement age at selected years of retirement of different cohorts (2025, 2030, 2035, 2040, 2045, 2050, 2055, 2060, 2065, and 2070) we make the following assumptions for the main variables in the pension value equation. All the values and growth rates refer to nominal terms.

*Economy-wide average wages (**W**)*. We take as initial value the average wage in 2024, which equals 2218.4 Euros. We then assume that the wages will have the following growth rates, starting in 2025 and following the LB forecast, wages will grow 8,2%. This will be the growth rate of wages between 2025 and 2035. After 2035, we consider that wage growth will steadily slow down as Lithuania will be closer to convergence with most advanced economies in Europe. We assume average wages will grow 7.4% between 2035 and 2050, then will switch to a growth rate of 6.6% between 2050 and 2060, and finally will grow 5.7% between 2060 and 2070. Figure A.1 shows the projected wage growth in the economy between 2025 and 2070, including past wage growth observed between 2021 and 2024.

*Government set average wage (**G**)*. This value is established by the government for each year and will affect the number of SODRA points individuals collect. The value of this wage in 2024 was 1902.70 relative to the average wage in the economy of 2218.4 Euros. Our initial value for the scenarios is the value already established by the government in 2025, which equals 2108.9 Euros. This value will be growing steadily following the economy-wide average wage trend explained above. However, we impose a small penalty based on the deviations observed in the previous years between the official average wage set by the government and economy-wide observed wages. This difference was 0.04 percentage points between 2018 and 2024. We impose this penalty up to 2035, and from then on, we assume that the error decreases as the economy-wide average wage growth slows down. Between 2035-2050, the penalty is equal to 0.01pp, then it becomes 0.0004pp between 2050 and 2060, and for the last 10 years (2060-2070) the penalty is 0.0002. Figure A.1 shows the projected growth in the Government set average wage between 2025 and 2070, including past growth observed between 2021 and 2024.

Figure A.1. Average wage growth



*Individual wages (**w**).* For individual wages, we take insights from life-cycle models of wage growth: a hump-shaped profile wage over age. In other words, wages will grow faster than the average wage in the economy at the beginning of workers' career and then converge to the average. We assume the following parametric wage growth across different ages: for cohorts that we observe between 19 and 65 years old (this will be the cohort that would retire in 2070), wage growth will double the economy-wide average wage growth by 1.8 times while the worker is potentially in college and then the growth will be 2.5 times the average wage growth between 23 and 29.[12] Between ages 29 and 33, life-cycle wage growth will slow down to be 1.3 of the average in the economy, between 33 and 38 will be 1.2 times the economy growth, and between 39 and 65, life-cycle wage growth will be equal to that of the economy.[13] The initial values are chosen based on microdata evidence from SODRA 2019 as well as Survey Earnings Structure in 2022 reflecting wage differences across age groups, differences that are not linear. We obtain average wages for different age groups and updated them to 2024 values. To these initial values we applied the specific life-cycle wage growth described earlier. The initial values are presented in Table A.1. In addition, Figure A.2 shows, for the cohort retiring in 2070, the life-cycle wage growth profile applying the parametric age-specific growth rates to its initial value.

Table A.1. Initial wages for each cohort in 2024

Retirement year	Age in 2024	Wage in 2024 (Euros)
2025	64	1955.2
2030	59	2008.8
2035	54	2119.6
2040	49	2193.6
2045	44	2443.6
2050	39	2642.2
2055	34	2613.6
2060	29	2488.4
2065	24	1710.7
2070	19	1191

*SODRA pension values (**B** and **V**).* Since January 1, 2018, SODRA pensions have been linked to the total wage bill in the economy, i.e., the product of average wages and total employment in full-time equivalents. Both the basic pension amount (flat-rate component, B) and the value points (V) are adjusted annually by the growth of the total wage bill in the economy, averaged over the last three years, the current year and three forecast years. Since 2022, the indexation formula has been modified to establish conditions for faster indexation of the contributory part of pensions (see the 2024 Lithuanian Ageing Report for more details). In our analysis, to simplify calculations we assume that the conditions introduced in 2022 do not apply and, hence, both B and V grow at the same pace: the average growth in the past three years, the current year, and the projected next three years. As initial values for our projections, we use the values of 2025 set by the government: B = 298.45 Euros, and V =7.16 Euros. Figure A.1 shows the projected annual growth

[12] For example, if the average wage in the economy grows at 6.6%, for the cohort who will retire in 2070, the wage growth while they are 23 to 29 years old will be 2.5 times 6.6%, i.e., 16.4% wage growth.
[13] Importantly, as different cohorts will be present at different contexts regarding the economy-wide wage growth, some cohorts will exhibit different life-cycle wage growth even if they have the same age.

of the wage bill under between 2025 and 2070, along with the observed growth between 2021 and 2024.

*Minimum contribution years (**MY**).* These values are defined based on current legislation, and we assume that there will not be any policy change in these figures over the period of our projections besides the agreed increase for 2027. The minimum contribution years is 34 until 2027, from 2027 up to 2070 we fixed the minimum contribution years to 35 years.

*Actual contribution years (**CY**).* Using the information on the actual pension amount in 2024 (598.10 Euros) from SODRA website along with the pension value formula for Pillar I, we recovered the actual contribution years for 2024, i.e. 38.90 years. The number comes from solving for CY the formula for Pillar I. The other values used in the calculation are B = 269.77, MY = 34, W = 2218.4, G = 1902.70, V = 6.38, all refer to 2024. Given the increase in minimum contribution years and, plausibly, longevity, we allow the actual number of contribution years to steadily increase across cohorts. The cohort-specific values are Table A.2.

Table A.2. Contribution years by cohort at retirement time

Retirement year	**Actual contribution years**
2025	38.9
2030	39.9
2035	40.2
2040	40.5
2045	40.8
2050	41.1
2055	41.4
2060	41.7
2065	42
2070	42.3

Number of points per year. To calculate the number of points per year, or SODRA units, upon retirement in the absence of complete histories of workers, we assume they are the result of CY times the ratio of the individual wage in the year of retirement to the Government set average wage in the same year, $\frac{W}{G}$.[14] Under this assumption, we obtain the following average number of points per year, i.e., the average ratio of individual wages to government average wage, for each cohort, over their whole career (see Table A.3).

[14] While not perfect, when we compare the average number of points per year using this approach to the average number of points per year collected for the cohort we can project their entire life-cycle wage profile, we get almost identical numbers, suggesting that our assumption is a good approximation.

Table A.3. Average number of points collected per year at the end of the career

Retirement year	Number of SODRA units by retirement moment
2025	1.003
2030	1.049
2035	1.126
2040	1.163
2045	1.312
2050	1.427
2055	1.490
2060	1.566
2065	1.688
2070	1.656

*Interest rate in pension funds (**r**).* We calculate the return of pension funds by age group by considering the average historical returns on the stock market and on government and corporate bonds, together with the composition of the fund for each age group. For example, according to Swedbank's risk profile analysis, the fund for people under 44 years of age invests 97% of its assets in the global equity market, while the fund for people 64 years of age invests 80% in government and corporate bonds and 20% in global equities. We assume an average stock return of 10% per year and an average bond return of 3% per year. We use a minimal approximation to match the age groups of the pension funds to those used in our analysis, and the final annual rates of return by age group are shown in Table A.4 below.

Table A.4 Lifecycle interest rate of pension funds

Age bracket	Rate of return
<44	0.09
45-49	0.09
50-54	0.08
55-59	0.05
60-65	0.03
Average over the life-cycle	0.07

To calculate the value of Pillar II funds at retirement, we combine (i) available information from cohort-specific pension funds referring to the average values as of 2024 with (ii) the interest rate life-cycle profiles. The initial values assumed to be accumulated by each cohort as of 2024 are in Table A.5. In addition, Figure A.2 shows the resulting nominal value of accumulated funds in Pillar II for the cohort retiring in 2070 along with the nominal value of annual earnings.

Table A.5. Initial value of accumulated funds by cohort in 2024

Retirement year	Age in 2025	Average accumulated amount in 2024 per participant (Euros)
2025	65	6586
2030	60	7252
2035	55	8665
2040	50	9241
2045	45	8076
2050	40	5954
2055	35	5086
2060	30	4008
2065	25	1953
2070	20	187

Figure A.2. Lifecycle wage growth for 2070 cohort