

ANALYSIS OF PUBLIC DEBT TRENDS IN LATVIA

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Abstract. In recent years, the size of public debt has increased significantly in Latvia and the European Union. However, a huge level of public debt negatively affects economic development - both at the regional and state levels. Moreover, increased interest rates increase the financial burden on the state budget. Therefore, one of the goals of the EU financial policy will be to stabilize public debt in the coming years. The purpose of the work is to analyse trends in changes in public debt and identify the main factors influencing the growth of public debt. Using the Domar model, the author will develop the main scenarios for changes in public debt. The risks that public debt poses to the economy will also be assessed.

Key words: public debt, GDP growth, inflation.

JEL code: H60, H68, O11

Introduction

Public debt is of great importance in the economy of the state. On the one hand, public debt allows you to temporarily increase state budget expenditures, finance important projects and support the state economy. On the other hand, the national debt places a heavy burden on the shoulders of future generations who will have to pay it off. Nevertheless, with developed financial markets, government debt can be refinanced almost indefinitely; all you need to do is service the debt and pay interest on time. Therefore, a logical question arises - what should be the optimal size of public debt. At the end of 2023, Latvia's public debt reached 16.5 billion euros, or approximately 8,698 euros per resident of Latvia (Eurostat database, 2023). Is this dangerous for the Latvian economy and how effective is public debt management policy in general? Neither absolute nor per capita figures are sufficient to assess the sustainability of public finances, as this benchmark does not provide sufficient information about solvency. Essentially, when assessing a government's creditworthiness, it makes sense to act like a bank. The loan amount must be assessed in relation to the borrower's income, assets and pre-existing financial obligations. The aim of the research is to analyse the main trends in Latvian public debt in the future. The tasks are to analyse the main factors influencing public debt and make the main scenarios for the development of Latvian public debt. In the paper, the following research methods are used: analysis of primary and secondary data, method of mathematical modelling (Domar model), scenario analysis method.

1. Domar model

Since the national government has access to the income and assets of the national economy through taxation or other coercive measures, aggregate economic indicators are a useful indicator of government debt. Accordingly, the Maastricht criteria apply gross domestic product (GDP) as the denominator of the ceilings for the public debt-to-GDP ratio (60 percent) and the deficit ratio (three percent). (*Council of European Communities, 1992*). The leverage ratio (relative to government spending) and the borrowing ratio (relative to GDP) are related to the deficit ratio; the difference is that the former are derived from fiscal statistics, while the deficit ratio is derived from national accounts. In addition to the deficit ratio, the primary fiscal balance is an important indicator of the sustainability of government finances. It is calculated as the difference between income and expenses of the current budget after deducting individual budget items. It excludes expenses in the form of interest payments and contributions to reserves, as well as income from net borrowings, withdrawals from reserves, and income from the sale of government assets (for example, through privatization). The primary balance sheet shows whether the government is making

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progress on fiscal consolidation. It is similar to the ratio of net borrowing to interest expenses of central, regional or local governments. If there is a primary surplus (positive primary balance), then there is enough income to cover current expenses (excluding interest payments). If the primary surplus exceeds interest payments (interest on previous borrowings), debt falls. However, if the primary surplus is not sufficient to finance interest payments (or if there is a primary deficit), then the debt increases. (Holtfrerich et al., 2015).

If GDP growth lags behind debt growth, it creates a higher debt burden for future generations. Other ratios for assessing the dynamics of public debt are the interest-to-tax ratio and the interest-to-expenditure ratio. They are determined from fiscal statistics and refer to interest payments on tax revenues or government expenditures, respectively. These relationships have been criticized as having limited information value. They provide information only on the designated indicator, without indicating when the danger threshold for public debt is exceeded (Escolano, 2010).

The government can increase its fiscal space in the short and medium term by borrowing over longer periods. The answer to the question to what extent government debt makes sense in the long term and whether it can be raised without any risk essentially depends on whether the government can finance its expenditures in a way that does not damage its future creditworthiness and solvency. The consequences of public debt on the state's ability to act have, to a large extent, already been illustrated by Domar (1944).

Assuming (in the long run) a constant real growth rate γ , a constant inflation rate π and a constant real interest rate ρ , and a constant rate of net new debt (deficit ratio) k , then the debt ratio (total government debt D over national output Y) is independent from the initial value converges to the following value:

$$\frac{D}{Y} = \frac{k}{\gamma + \pi} \quad (1)$$

The debt ratio (government debt divided by nominal national product) converges over time to the ratio of the deficit ratio and the growth rate of nominal national product. This equation becomes clear if we express it as $(\gamma + \pi)D = kY$. The left side represents the annual increase in debt if it grows as fast as nominal national product. The right-hand side also represents the annual increase in debt expressed using the deficit ratio. Accordingly, the higher the long-term deficit ratio, the higher the long-term debt ratio will be, and it will be lower the higher the growth of nominal national product. This is the result of the sum of the real growth rate and the inflation rate. While deficits and government debt can rise over the long term under sustainable policies, neither should grow faster than nominal national product. The long-term debt ratio, together with the difference between the real interest rate ρ (also assumed constant) and the real growth rate γ , determines the fiscal capacity of the public sector in the long run: these parameters determine the primary surplus - expressed as the difference between tax receipts T and (net) government expenditure (excluding interest payments) G - the state must generate in the long term to remain solvent (Holtfrerich et al., 2015). Equation (2), derived from equation (1), shows the relationship between primary surplus and national product:

$$\frac{T-G}{Y} = (\rho - \gamma) \frac{D}{Y} \quad (2)$$

As long as the real interest rate exceeds the rate of economic growth, a continuous primary surplus must be created in the long run to finance interest payments. The higher the long-term debt ratio and the greater the difference between the real interest rate and the constant growth rate, the higher the interest expense will be. In the long run, a primary budget deficit is possible only if the real national product grows faster than the real interest rate. γ and ρ are real rates. The creation of money can also change this

condition only slightly: In addition to tax revenues, seigniorage arises, that is, the profit received by the central bank by issuing money (Baum et al., 2013). However, they constitute only a very small share of the national product. There are theoretical models that show that the real growth rate can be higher than the real interest rate even in long-run equilibrium. This is also called a state of "dynamic inefficiency". In this state, the economy is so capitalized that short-term declines will not have a negative impact on future prosperity. This is because sustainable consumption peaks when the interest rate equals the growth rate, which is also known as the "golden rule of savings" (Klaus et al., 2017). In such a case of dynamic inefficiency, public debt can be increased without negatively affecting both future ability to act as well as economic development. However, there is disagreement as to how long this phase will last. In addition, there are theoretical models that demonstrate that even with a negative real interest rate, a long-run equilibrium can exist. Since the nominal interest rate cannot usually become negative, negative real interest rates are only possible if the inflation rate is positive. On the other hand, there are theoretical arguments that argue that in the long run the real interest rate cannot be lower than the growth rate of the economy. Their proponents especially point to the existence of non-reproducible factors of production, such as land, whose scarcity rent increases in proportion to the national product (Albu et al., 2021).

These future scarcity annuities will have an "infinite" present value of capital at a constant interest rate that is below the growth rate, meaning that there is no balanced investment market. Therefore, the interest rate will constantly exceed the growth rate. Under these conditions, higher public debt reduces the government's fiscal capacity. Either taxes must be increased over the long term without the government providing additional services, or the government must reduce those services accordingly. If borrowing leads to higher interest rates, which becomes more likely when government debt increases, it can also "crowd out" private investment. All of these factors can constrain an economy's growth and therefore its international competitiveness and job creation potential. The higher the debt ratio, the more likely it is that debt sustainability limits will be reached if shocks cause debt to increase. The academic debate about whether the rate at which a national government can raise debt is above or below the rate of economic growth, and under what conditions, is by no means settled (Holtfrerich et al., 2015).

From an empirical perspective, the interest rate that private borrowers with excellent credit scores must pay generally exceeds economic growth. Many economists view this as an indication that public debt must be reduced to allow private investment on better financing terms. However, other economists suggest that, firstly, interest on debts paid by governments has often been below the rate of growth of national product in the past and that, secondly, especially over time, the increased propensity to save is an indicator that current and future interest rates are even lower than in the past. From this point of view, there is a lot to argue against reducing the public debt ratio (Vanlaer et al., 2015)

Domar's model allows for the calculation of a "natural limit" on government debt, which is distinct from other types of limits on government debt (such as legal, political, or psychological). The key result of Domar's model is that if the government's net borrowing to GDP ratio is higher than the sum of the real growth rate and the inflation rate, the debt ratio will not reach a fixed limit in the long run. The more the two measures diverge (deficit ratio > economic growth rate plus inflation rate), the faster the debt ratio will increase and the more likely it is that the government debt will "explode" (Holtfrerich et al., 2015). If we assume (over the long run) a constant rate of real growth, a constant rate of inflation, and a constant rate of net new debt (deficit ratio), then in the long run the ratio of government debt to GDP will approach the following limit, regardless of the initial value:

$$\text{Debt limit} = \frac{\text{nominal government debt}}{\text{nominal gross domestic product}} = \frac{\text{deficit ratio}}{\text{economic growth} + \text{rate of inflation}}$$

2. Improved Escolano model

Domar model was later improved by Escolano (2010). With these notations, the basic equations are summarized as follows: B is the government debt, r is the nominal interest rate on government debt, g is the growth rate of nominal GDP (or GNI), P is the primary balance, and D is the overall budget balance. Lowercase letters take these variables as ratios to nominal GDP or GNI. Equation (3) shows the determinants of government debt in period t , namely the debt in the previous period $t - 1$, the interest payments in t on the debt that prevailed at the end of the previous period, and the primary balance, which is defined in equation (4). Debt may increase or decrease by adjusting the stock flow (i.e., debt-deficit) of the SFA, which totals the debt issued to purchase financial assets (or the proceeds from the sale of financial assets), excluding statistical errors. This type of debt is part of gross debt but does not include financial assets owned by the government. A primary surplus will reduce the budget deficit or result in a budget surplus of t and a lower B , if everything else remains constant. It should be noted that all variables used in this section are adjusted for cyclicity, as the focus is on the long term, abstracting from the cyclicity of growth (Priewe, 2018).

$$B_t = B_{t-1} + rB_{t-1} - P_t + SFA_t \quad (3)$$

The primary balance of period t is the overall budget balance, total tax revenues (T) less total expenditures (G), which are reduced by interest payments on debt of the previous period. This implies that the overall budget balance plus the interest payments equal the primary balance. P shows the degree at which government revenues are used for the prime expenditures for purchasing goods and services, public investment and transfers (Priewe, 2018).

$$P_t = (T_t - (G_t - rB_{t-1})) = D_t + rB_{t-1} \quad (4)$$

The budget balance D is $T - G$, relative to GDP denoted as d , and the interest payments on public debt, as a share of GDP is denoted as z . Hence, we obtain for the budget balance (4a), all variables as share of GDP

$$d_t = p_t - z \quad (4a)$$

The change of the debt-to-GDP ratio against the previous period is shown in equation (5)

$$\frac{B_t}{Y_t} - \frac{B_{t-1}}{Y_{t-1}} = \frac{B_{t-1} + rB_{t-1} - P_t + SFA_t}{Y_t} \quad (5)$$

If all components of (5) are taken as shares of GDP, denoted in lower case letters, we obtain with a few re-arrangements of equation (6):

$$b_t - b_{t-1} = \frac{r-g}{1+g} b_{t-1} - p_t + sfa_t \quad (6)$$

Assuming that SFA is zero and that $1 + g$ differs not much from 1, the change in the debt ratio is approximated by

$$\Delta b_t \approx (r - g)b_{t-1} - p_t \quad (7)$$

This leads us to the key conclusion that the change of the debt ratio depends on the growth-adjusted interest payments on debt and the primary balance (7). If the debt level shall be held constant, a positive growth-adjusted interest payment obligation must be offset by a primary surplus of the same size, vice versa in the case of $g > r$. The sustainable primary balance, i.e. the one that keeps the prevailing debt ratio stable, is p' , and the corresponding budget balance is d' (Priewe, 2018)

$$p'_t = (r - g)b_{t-1} \text{ if } \Delta b_t = 0, d'_t = p'_t - z, \text{ if } b_t = b' = \text{constant} \quad (8)$$

For the Euro area, the simple equation portrays the sustainable budget deficit d' that maintains the debt ratio b' at the official ceiling of 60 percent. This equation is often used to derive the 3 percent deficit rule from a given 60 percent debt level and 5 percent nominal growth, as shown in (8a)

$$-d'_t = g'b'_t \quad (8a)$$

If d' is split into the primary balance and z (equation 4a), the interest payments on debt as share of the GDP, and the equation solved for p' , we obtain

$$P' = (r - g)b' \quad (8b)$$

If we go back to equation (6) and use λ as in (9), and disregard sfa , we obtain equation (10) for the debt ratio in t .

$$\lambda = \frac{r-g}{1+g} \quad (9)$$

$$b_t = (1 + \lambda)b_{t-1} - p_t \quad (10)$$

If t_0 is the initial period and t_N the N th period, equation (11) shows the value of growth adjusted interest payments until N and minus the sum of future primary balances.

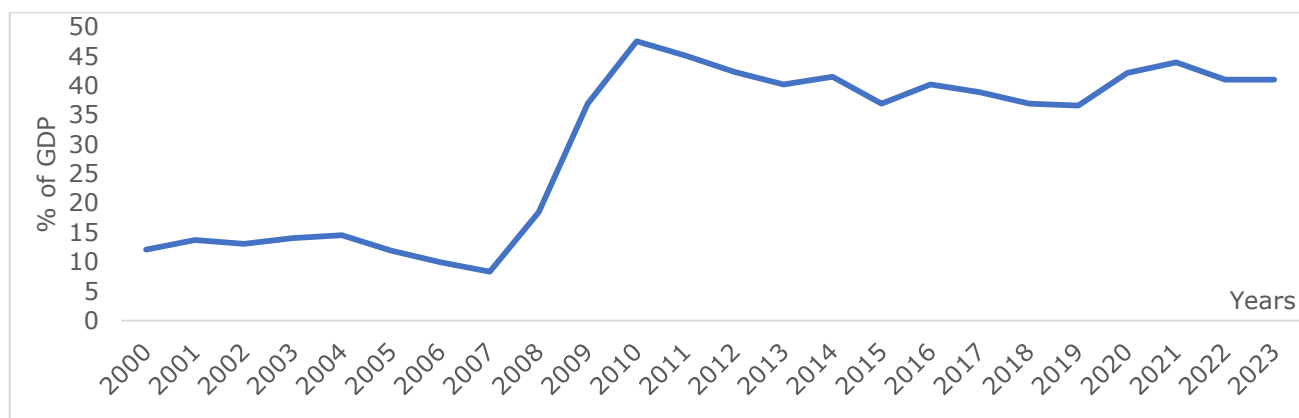
$$b_N = b_0(1 + \lambda)^N - \sum_{t=1}^N (1 - \lambda)^{N-t} p_t \quad (11)$$

Solving (9) for the present value of debt in t_0 , leads us finally to (12).

$$b_0 = b_N(1 + \lambda)^{-N} + \sum_{t=1}^N (1 - \lambda)^{-t} p_t \quad (12)$$

3. Analysis of the factors affecting the public debt of Latvia

Since the introduction of the national currency - the lat - Latvia has pursued a fixed exchange rate policy, which requires a low level of budget deficit. Later, after joining the European Union, Latvia strictly complied with the Maastricht criteria and did not allow the budget deficit to grow above 3% of GDP. As a result, a policy of low budget deficits made it possible to control external debt and prevent its growth. Until 2008, the Domar model showed its effectiveness - Latvia's public debt was at a very low level. However, in conditions of economic crisis, it is very difficult to comply with all the conditions of the Domar model. During a crisis, budget revenues sharply decline and in order to maintain financing of public expenditures, the government is forced to increase the size of public debt. In addition, during a crisis, GDP declines, which puts additional pressure on public debt. Over the past 20 years in the history of Latvia, there have been two crisis periods when public debt grew. The first is the 2008 crisis, when the budget deficit rose to 8-9%, and the fall in GDP in 2009 was -14.3%. As a result, the level of public debt increased from 8.4% in 2007 to 47.6% in 2010. The second period was the 2020 coronavirus pandemic, when due to the government's stimulating policies, public debt rose from 36.7% of GDP in 2019 to 44% in 2021 (Fig. 1).



Source: author's calculations based on Eurostat database

Fig. 1. Public debt of Latvia, % of GDP

And although in the short term an increase in external debt is allowed, in the long term it is necessary to take measures to stabilize the debt. In this case, the Domar model offers two options for stabilizing public debt. The first option allows you to reduce public debt through economic growth - in this case, the contribution of GDP growth should exceed 50%. This is an ideal option that allows you to painlessly reduce public debt. The government debt ratio is falling gradually, while real incomes of households and businesses are growing. At the same time, the economy itself is in a stable state. Calculations in Table 1. show that from 2012 to 2019, the contribution of economic growth to the reduction of public debt was 74% - this is a very high figure. As a result, public debt decreased from 47.6% in 2010 to 37.6% in 2019. The second way to reduce government is related to inflation. In this case, a sharp rise in prices depreciates the value of government debt. This is not a very effective way to reduce public debt - the purchasing power of households and businesses is reduced.

Table 1.

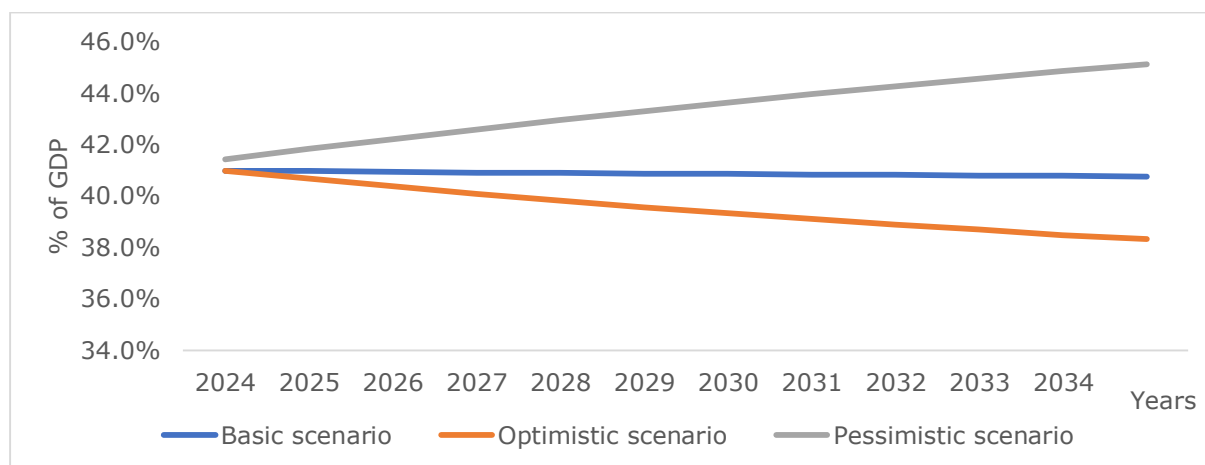
Factors influencing the decrease in the Latvian public debt ratio, in %

Factors	2012-2019	2022
GDP growth contribution	74%	15%
Inflation growth contribution	26%	85%

Source: author's calculations based on Eurostat database

Calculations in Table 1 show that in 2022, the contribution of inflation to the reduction of public debt was 85%. In this case, inflation acts as an additional tax that is imposed on households and businesses.

When forecasting government debt, Domar's model reveals another flaw. The Domar model works effectively only with stable economic growth. In a near-depression environment, when economic growth is close to zero and inflation is also low, even a small budget deficit will lead to an increase in public debt in the long run. This is a Japanese script. When forecasting the public debt of Latvia, the author developed three possible scenarios for the development of events. In the base scenario, inflation should be 2.2%, the budget deficit - 2%, and GDP growth - 3%. In this case, it will be possible to maintain the level of public debt at the current level of 41%. The optimistic scenario envisages inflation at 2%, budget deficit at 2%, and GDP growth at 4%. This will allow the government debt to be gradually reduced. In the pessimistic scenario, inflation is 2%, budget deficit - 2%, GDP growth = 2%. In addition, in a pessimistic scenario, it will not be possible to maintain public debt at the current level of 41% of GDP and it will begin to grow (Fig. 2). This means that in a depression, the government must abandon budget deficits to limit public debt.



Source: author's calculations based on Eurostat database

Fig. 2. Latvian Public debt scenarios, % of GDP

Conclusions

The Domar model allows to effectively control the level of public debt. Maintaining a low budget deficit allowed Latvia to maintain a low level of public debt until 2008. The Domar model can also be used to reduce government debt levels. The most preferable option is to reduce public debt through economic growth. Reducing government debt due to inflation does not have a positive effect and leads to a decrease in the purchasing power of the population. The Domar model works effectively only in stable economic conditions. In conditions of stagnation and depression, the Domar model requires abandoning the budget deficit, which does not allow stimulating the economy.

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