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SERBIA 2024-2033: DEBT SUSTAINABILITY AND GROWTH PERFORMANCE TESTING

Srbija 2024-2033 – testiranje održivosti duga i performansi rasta

Abstract

This paper examines Serbia's external debt sustainability in order to assess the applicability of the selected growth model. To this end, an empirical model was created for the generation of long-term projections and assessment of debt sustainability. The model distinguishes itself from existing models created by the International Monetary Fund and the World Bank as a practical tool. The macroeconomic balance table approach of the model, in contrast to these existing models, ensures that changes in one table reflect changes in others, thus ensuring both internal and external validity. It harmonizes individual macroeconomic aggregates and variables by combining them all at the same time. As a result, a detailed framework of interconnected long-term forecasts is established. In addition to this, the second part of the paper is dedicated to dynamic analysis of external debt by investigating which factors contribute to the creation of external debt and assessing their impact. In order to understand the extent of these contributions, a sensitivity analysis of the debt is performed. Utilizing this model of macro-projections, we can examine the debt path and evaluate how projected debt values respond to different macroeconomic shocks. This is particularly crucial given the growing global uncertainty, which includes both economic changes and security issues. Current conflicts in Ukraine and Gaza are likely to make investors more cautious about investing abroad. This presents significant challenges for small and open economies like Serbia in obtaining the necessary funding for its planned economic growth and development.

Keywords: *external macroeconomic position, development scenario, debt dynamics, model sensitivity*

Sažetak

Rad ispituje održivost spoljnog duga Srbije kako bi se procenila primenljivost izabranog modela rasta. U tom cilju, kreiran je empirijski model za generisanje dugoročnih projekcija i procenu održivosti duga. Model se razlikuje od postojećih modela koje su kreirali Međunarodni monetarni fond i Svetska banka kao praktičan alat. Pristup kojim se integrišu makroekonomske bilansne tabele, za razliku od ovih postojećih modela, osigurava da promene u jednoj tabeli odražavaju promene u drugim tabelama, čime se osigurava i unutrašnja i spoljašnja validnost. Model usklađuje pojedinačne makroekonomske agregate i varijable kombinujući ih sve istovremeno. Kao rezultat toga, uspostavlja se detaljan okvir međusobno povezanih dugoročnih projekcija. Pored ovoga, drugi deo rada posvećen je dinamičkoj analizi spoljnog duga kroz istraživanje faktora koji doprinose stvaranju spoljnog duga i procenu njihovog uticaja. Da bi se razumeo opseg ovih doprinosa, izvršena je analiza osetljivosti spoljnog duga. Koristeći ovakav pristup u izradi makroprojekcija, možemo ispitati putanju duga i proceniti kako projektovane vrednosti duga reaguju na različite makroekonomske šokove. Ovo je posebno važno s obzirom na rastuću globalnu neizvesnost, koja obuhvata i ekonomske promene i bezbednosna pitanja. Trenutni konflikti u Ukrajini i Gazi verovatno će učiniti investitore opreznijim u pogledu njihove spremnosti da ulažu u inostranstvo. Upravo to predstavlja značajne izazove za male i otvorene ekonomije poput Srbije u obezbeđivanju neophodnog finansiranja za planirani ekonomski rast i razvoj.

Ključne reči: *eksterna makroekonomska pozicija, razvojni scenario, dinamika duga, senzitivnost modela*

Introduction

The analysis of the long-term sustainability of external debt usually includes an assessment of a number of factors, including economic growth (from the expenditure side of Gross Domestic Product), balance of payments, i.e. foreign trade, foreign direct investment, remittances from abroad and other factors that affect external debt. These factors are important because they may affect Serbia's ability to repay its debt in the future. At the same time, they also represent channels through which influences from the international environment are manifested, and it is necessary to develop such an analytical approach that will enable timely quantification of external shocks. When interpreting the results of the analysis, that is, the derived values of indicators explaining external macroeconomic position of the country, the so-called soft factors such as the legal system, political events in the country, unresolved international issues, military-security challenges must be taken into account because all of these can greatly relativize the obtained results.

Depending on the objectives and available information, different approaches can be used in analysing the sustainability of a country's external debt.

Nevertheless, most existing methods rely on a mix of conjunctive analysis and complex econometric models. When applied to developing economies facing both internal and external pressures, these models are often less suitable due to data series breaks, difficulties in maintaining consistency across projections, and a lack of consideration for qualitative institutional factors. This limitation can be addressed by using a set of macroeconomic balance equations with a minimal inclusion of behavioural equations. This approach is central to the financial programming models utilized by the International Monetary Fund (IMF) and the World Bank (WB).

Polak [13] introduced the first financial programming model, which represents a systematic effort to integrate monetary policy with balance of payments issues. This model was later expanded to form the basis of IMF stabilization programs for economies with fixed exchange rates. Over time, this model underwent several modifications.

In the beginning of 1970s, WB introduced the Revised Minimum Standard Model (RMSM). The main goal of the approach is to find out the necessary levels of investment, imports, and financing resources from abroad required to obtained wanted real GDP and export growth rates. The model is based on a two-gap accounting framework, addressing the gap between investments and savings and the trade gap with the rest of the world. If domestic savings are insufficient to fund the targeted investment, the shortfall is covered by foreign financing through net imports. While the model's simplicity is a strength, it also presents challenges due to its simplified linkages and its reliance on numerous exogenous factors [1, p. 28].

With the aim to cover more policy options, the model was developed in such a way so as to include more economic agents inside a congruous flow-of-funds framework. This version, known as the Revised Minimum Standard Model eXtended (RMSM-X), includes four economic agents, i.e. sectors: Public (central government), Monetary (central bank and deposit money banks), Foreign (balance of payments), and Private (rest of the economy). Each sector has two accounts: a current account and a capital account. The fundamental macroeconomic identity on which the RMSM-X is based and its further explanation are already provided in Kovačević & Stević [10].

Based on the selected economic growth scenario and related model assumptions, the model produces outputs that are used to calculate indicators of the external macroeconomic balance for the country. Such indicators include a risk analysis tied to the implemented projection results. Additionally, an alternative development scenario with poorer economic growth is evaluated together with the baseline scenario.

Beyond the technical aspects, the proposed model incorporates the knowledge and expertise of the structural properties and performing characteristics of an economy. Simultaneously, the model avoids the use of heavy econometrics given its inherent challenges. This deliberate choice simplifies the statistical-mathematical apparatus of the model to the maximum extent. However, the model's complexity is accentuated in terms of the interconnection of balances, with the core of the model serving as a bridge linking the GDP usage, the "Balance of payments," and

the anticipated schedule of payment of public and private debt for the country [10, p. 43].

The novelty in this paper is the introduction of a dynamic analysis of external debt by determining which factors and to what extent contribute to the creation of external debt and performing sensitivity analysis.

Methodological framework

The detailed explanation of the methodology based on which the core model is developed with its assumptions is already provided in Kovačević & Stevović [10]. Such a model has the capacity to facilitate its further extensions. One of them is the dynamic analysis of the country's external debt which is regarded as an important step in the examination of its debt sustainability as it helps identifying the factors that contribute to the country's external debt while simultaneously determining the direction and intensity of their influence. In that respect, the model was extended with a special (second) part called dynamic analysis of external debt (both in baseline and alternative scenarios) and the identification of factors that generate the debt.

The main aim of this kind of analysis is to understand how external debt is generated and pinpoint areas that need attention to mitigate the risk of excessive debt or repayment issues. Policymakers can use this information to devise strategies that enhance key economic indicators like exports, fiscal discipline, and domestic savings, thereby reducing reliance on external borrowing. Furthermore, understanding these factors enables policymakers to secure more favourable borrowing terms, such as lower interest rates and extended repayment periods, ultimately easing the debt servicing burden on the national budget and lowering external debt levels.

It is important to note that these factors vary from one country to another based on specific national characteristics and can change with both internal and international conditions. Common contributors to external debt include a high current account deficit, decreased foreign currency inflows due to reduced exports, currency depreciation, rising international interest rates, and political or economic instability (Table 1).

External debt sustainability refers to a country's capacity to meet its short-term and long-term debt obligations to foreign entities without requiring significant adjustments to its macroeconomic policies. Unlike fiscal sustainability, which focuses solely on government debt to both domestic and foreign entities, external debt sustainability considers the entire economy's debt, encompassing all sectors (government, non-financial, financial, and household) that may owe money to foreign creditors. Thus, external debt sustainability is a broader indicator of a nation's total indebtedness to foreign entities and reflects the overall financial stability of the economy. In essence, it is a critical measure of a country's economic health and stability.

Debt Sustainability Analysis (DSA) examines how a country's external debt situation changes over time in relation to indicators such as GDP, exports etc. or other measures of its ability to repay debt. To achieve debt sustainability, these ratios should eventually stabilize at reasonable levels by the end of the projection period at the latest, and should not become explosive thereafter [7, p. 42]. The trajectory of the ratio of external debt to GDP is influenced by several factors – domestic macroeconomic conditions, economic policy, including the structural

Table 1: Factors and their impact on external debt

Factor	Description of the influence
Large trade deficit	When a country runs a large trade deficit and relies on foreign capital to finance its consumption, it can quickly accumulate foreign debt.
Decrease in exports and consequent inflow of foreign currency	Countries that rely heavily on raw material exports or have a narrow export area may have difficulty generating enough foreign exchange to meet their external debt obligations.
Depreciation of the domestic currency	In the event of a depreciation of the domestic currency, the real value of the country's external debt may increase, making it difficult to service it.
High borrowing costs	High interest rates in the international capital market can make it difficult for countries to service their external debt, especially if they have high levels of debt.
Weak institutional and legal system	Countries with weak institutional and legal systems may have difficulty attracting foreign investment and may be more prone to default on their external debt.

Source: Authors' compilation based on IMF [7]

policies of the country, then, circumstances on global commodity markets and occurrences on international capital markets. If the ratio of external debt to GDP or external debt to exports does not stabilize at a reasonable level under reasonable macroeconomic assumptions, it may indicate that the country will face difficulties in servicing its external debt in the future [7, pp. 43-44]. This may be a cause for concern. In this sense, it is very important to provide an analytical basis for effective monitoring of external debt dynamics. Below is a methodological framework designed to serve this purpose.

Following the practice and recommendations of the International Monetary Fund in this area, the following framework for external debt sustainability analysis was adopted and adapted to the author's approach. The framework consists of two constitutive parts – (i) analysis of debt dynamics and identification of factors that generate debt and quantification of their impact in the form of their contributions and (ii) sensitivity tests, i.e. bound testing for input variables (interest rate on external debt; real growth rate; change in foreign exchange rate; deterioration of the current account of the Balance of payment; combined impact of the previously mentioned input variables) [7, p. 44].

Dynamics of external debt and factors that generate debt

The analysis of the dynamics of external debt includes the decomposition of the historical (realization) and projected dynamics of the country's debt. Decomposition (breakdown into key factors of external debt) is based on the debt dynamics equation, that is, the change in the state of external debt over time [7, p. 27].

However, for the purpose of analysing the sustainability of a country's external debt, it is necessary to focus on the non-interest bearing balance of the current account, which represents only one component of the Current account balance. The second component is the interest-bearing balance of the current account (balance of primary income based on interest inflows/outflows – interest receipts/payments). This is because interest payments are already reflected in the debt balance and debt service obligations, and therefore do not contribute directly to the accumulation

of new external debt. On the other hand, when it comes to the financial account (FA) balance, it includes both debt-creating and non-debt-creating capital flows. Debt-creating capital inflows refer to borrowing from abroad, while non-debt-creating capital inflows include FDI-based equity investments and portfolio investments. The sum of the non-interest-bearing current account balance and capital inflows that do not create debt is equivalent to the total inflow of resources into the country that do not contribute to the increase in the country's external debt. Therefore, the sum of the non-interest-bearing balance of the current account and the inflow of capital that does not create debts represents the resources available to the country for financing its obligations based on external debt servicing and new investments without increasing the external debt balance [5, pp. 245-318].

Thus, the increase in external debt over time can be represented as follows:

$$D_t - D_{t-1} = r_t \times D_{t-1} - CAB_t \qquad (1)$$

Rearranging of the identity leads to the following:

$$D_t = (1 + r_t) \times D_{t-1} - CAB_t \qquad (2)$$

where CAB is the balance of the current account of the Balance of payments, without interest paid – the so-called non-interest-bearing current account of the balance of payments (that is, net export of goods and services increased by the balance of primary income without interest payments and the balance of secondary income, i.e. transfers with foreign countries); D_t – balance of external debt at the end of year t in foreign currency (EUR); r_t – nominal effective interest rate in foreign currency that the country pays on its external debt.

So, by dividing both sides of the identity (2) by (Y/e), we get the ratio of external debt to GDP, that is:

$$\frac{D_t}{(Y_t/e_t)} = (1 + r_t) \times \frac{D_{t-1}}{(Y_{t-1}/e_{t-1})} \times \frac{(Y_{t-1}/e_{t-1})}{(Y_t/e_t)} - \frac{CAB_t}{(Y_t/e_t)} \qquad (3)$$

whereby $CAB_t = (X_t - M_t) + PI_t + SI_t$,

where X_t is export value, M_t is import value, PI_t is Net income from abroad, i.e. Balance of primary income, without interest payments, SI_t is value of Net current transfers, i.e. Balance of secondary income.

By further rearranging relation (3), the ratio of external debt to GDP in the current year is derived as

$$d_t \times (1+g+\rho+g\times\rho) = (1+r)\, d_{t-1} - (1+g+\rho+g\times\rho)tb_t \quad (4)$$

where, g denotes the growth rate of real GDP, r the nominal effective interest rate in foreign currency that the country pays on its foreign debt, ρ is GDP deflator in foreign currency and is the foreign trade balance of goods and service (relative to GDP in foreign currency) that must be covered by borrowing, i.e. the one that generates debt (in %GDP)[1], that is $tb_t = CAB_t/(Y_t/e_t)$ or $tb_t = [(X_t - M_t) + PI_t + SI_t]/(Y_t/e_t)$.

By final rearrangement of the equation, endogenous debt dynamics are derived:

$$d_t - d_{t-1} = \frac{(r - g - \rho - g\times\rho)}{(1 + g + \rho + g\times\rho)} \times d_{t-1} - tb_t \quad (5)$$

where the growth rate of the value of the GDP deflator in foreign currency (in our case, in euro terms) was obtained as:

$$1 + p_t = [(\frac{Y_t}{e_t})/(\frac{Y_{t-1}}{e_{t-1}})]/(1+g_t) \quad (6)$$

In the specific case, appreciation is defined as the nominal rate of change in the exchange rate of the dinar against the euro.

This kind of decomposition is useful for identifying the origin of the (in)stability of the external debt and arises mainly from the behaviour of interest rates, the growth rate of the economy, inflation or the movement of the real exchange rate, or through the adjustment of the primary, trade balance.

The main intention is to provide a tool that will help decision-makers to systematically examine the evolution of debt dynamics under alternative assumptions regarding macroeconomic trends, influences from the external environment, and political and social developments in the country.

Sensitivity analysis: Alternative scenarios and bound testing for input variables

The second building block of the proposed methodology is a sensitivity analysis of changes in input variables, such as *interest rates on external debt; real growth rate of GDP; exchange rate change; deterioration of the Current account of Balance of payment; the combined influence of the previously mentioned input variables.*

In fact, it is a set of standard sensitivity tests around a baseline scenario, which examine the implications of alternative assumptions about the aforementioned input variables. Detailed display of input variables with an explanation of sensitive tests is given in a separate chapter about External Debt Dynamics.

The first sensitivity test equalizes the key variables with their historical averages – this should allow insight into the ambition of the basic projection in relation to historical experience, that is, whether the adjustment provided by the baseline projection far exceeds the country's historical averages.

The second sensitivity test takes into account adverse shocks on individual variables in the amount of up to three standard deviations during the projection period, while the third test involves the so-called combined shock of several variables simultaneously.

Since the volatility of the real exchange rate can, historically speaking, be low due to the fixed exchange rate regime (this includes dirty float, as well as the crawling peg), an additional scenario in which there is a depreciation of the domestic currency of 30% is considered.

The predicted framework uses the mean plus ¼ to one standard deviation, as well as the scenario where the shocks occur simultaneously, with the understanding that further calibration of the sensitivity tests is likely to be necessary[2]. The need for further calibration in sensitivity testing arises for several reasons. In the first place, economic, geopolitical, or other conditions can change over time. Sensitivity tests conducted under one set of conditions may not be applicable or accurate when conditions change. Calibration is necessary to adapt the tests to these new circumstances. Also, in dynamic environments, new risks or factors may emerge that were not initially considered – these may need to be incorporated into the sensitivity tests to ensure a comprehensive analysis of potential outcomes. In the end, as more information becomes available or as the understanding of the system improves, models

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1   Current account deficit that is not covered by net inflow of capital based on equity investments but is covered by net borrowing.

2   According to Chebyshev's inequality, for any well-defined probability distribution function, the probability of an outcome greater than k-standard deviations from the mean is less than $1/k^2$. Although this does not require any special assumptions about the distribution, it does, of course, assume that the sample mean and standard deviation provide a good estimate of the corresponding population moments.

used in sensitivity testing may need to be refined. Such calibration, in fact, helps update models to better reflect the underlying dynamics of the system.

In general, according to IMF recommendations, the previous ten years should be used to calculate the relevant averages and standard deviations, unless there were significant structural changes or shocks in this period (such as hyperinflation, currency crisis, etc.), in which case the five-year period may be more appropriate.

Results

Baseline scenario: Assumptions and underlying indicators

As a small and open economy, Serbia's macroeconomic policy is profoundly under the impact of both the global economic and geopolitical circumstances, especially those of its significant trading partners. The critical importance of foreign investments and the substantial inflow of credit capital are integral to Serbia's carefully chosen growth model. Nevertheless, during the previous period of chained global crises, Serbia has maintained fiscal flexibility, which has been crucial in enabling the government to respond adeptly to the challenges caused by COVID-19 and subsequent crises. Another significant asset for Serbian economy is the notable stability of the financial sector, characterized by the robust capital adequacy of the banking sector and substantial exchange reserves. Yet, the potential escalation of the Russian-Ukraine crisis and war in Gaza pose a grave threat, potentially jeopardizing further necessary adjustments and the subsequent recovery of the global economy.

Main baseline model assumes that the GDP growth rate for the period 2024-2033 is equal to 3.9% in average.

According to the quarterly GDP estimation of the SORS, the estimated GDP growth rate in 2023 is 2.5%. The model also incorporated a growth rate of 3.5% in 2024 (Figure 1), which would be followed by continuity with a growth rate of 4% for the remaining projection period (from 2025 to 2033). In line with this growth trajectory, the GDP is projected to reach EUR 141.5 billion by 2033.

The chain of crises in the past period (Covid-19, the war in Ukraine, Israel-Hamas war in Gaza, the energy crisis, climate change, etc.) resulted in the deterioration of the foreign trade ratio for most European countries. It particularly concerns countries that are net importers of energy products. Serbia also belongs to this group – in 2022, the deficit of goods and services amounts to 11.7%, primarily due to the increase in import prices of energy sources (oil, oil derivatives and gas). In 2023, the proportion of the goods and services deficit fell to 5.2%, after which, it would recover to 7.0%, and in 2033, it would stop at 8.0%.

The key element in the movement of the proportion of the current transactions deficit of the balance of payments in GDP is the trend in the proportion of the goods and

Figure 1: GDP trends, 2019-2033
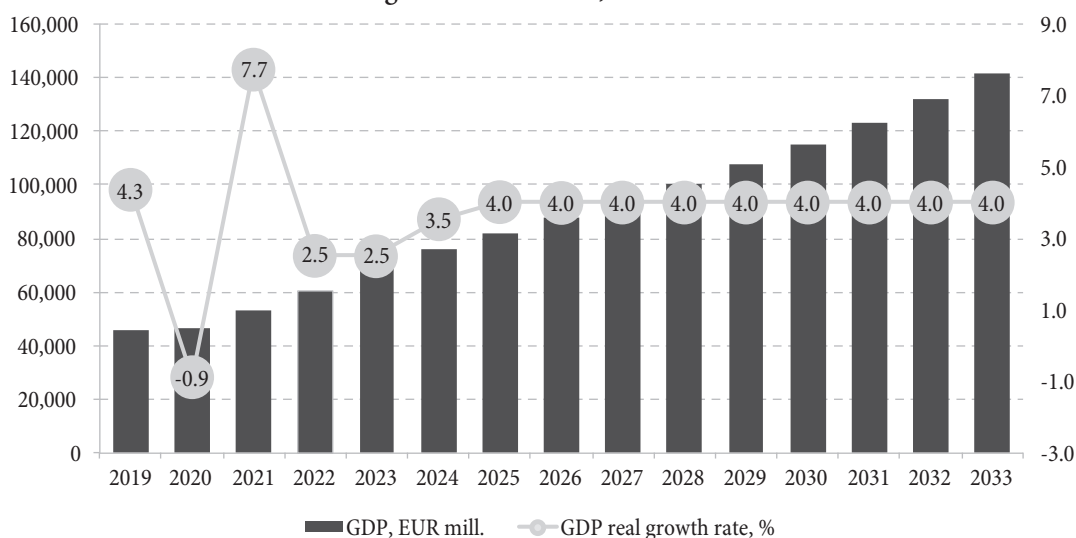
Source: Authors' calculations, SORS

services deficit (negative net exports). With the aimed share of net exports (8% throughout the entire projection period), the deficit values appear relatively consistent across the projection period, hovering around the range of -4.3% to -4.5%.

The target parameters in the basic development scenario are:

- increasing the share of gross fixed capital formation from an estimated 24.3% in 2024 to 27.0% in 2028 and 29% in 2033 (with an average annual growth of 6.7%),
- reduction of the share of state spending in GDP[3] from an estimated 17.0% in 2024 to 15.0% in 2033,
- increasing the proportions of goods and services exports in GDP, from an estimated 59.5% in 2024 to 65% in 2033,
- the current transactions deficit of the BoP stabilized at 4.5% of GDP in 2033.

Inflation rate in 2023 amounted to 12.1%. By the end of 2024, it would return to the inflation target range, giving an average inflation rate for that year of 4.0%. From 2027 until the rest of the projection horizon, inflation goal of the National Bank of Serbia would be reached, which

is 3%. According to the baseline scenario, the exchange rate would be relatively stable, giving an average annual depreciation of the dinar of no more than 0.5% till the end of the projection horizon.

According to the model settings, the target share of gross fixed capital formation will be achieved if their average annual real growth amounts to 6.7% in the projection period (2024-2033).
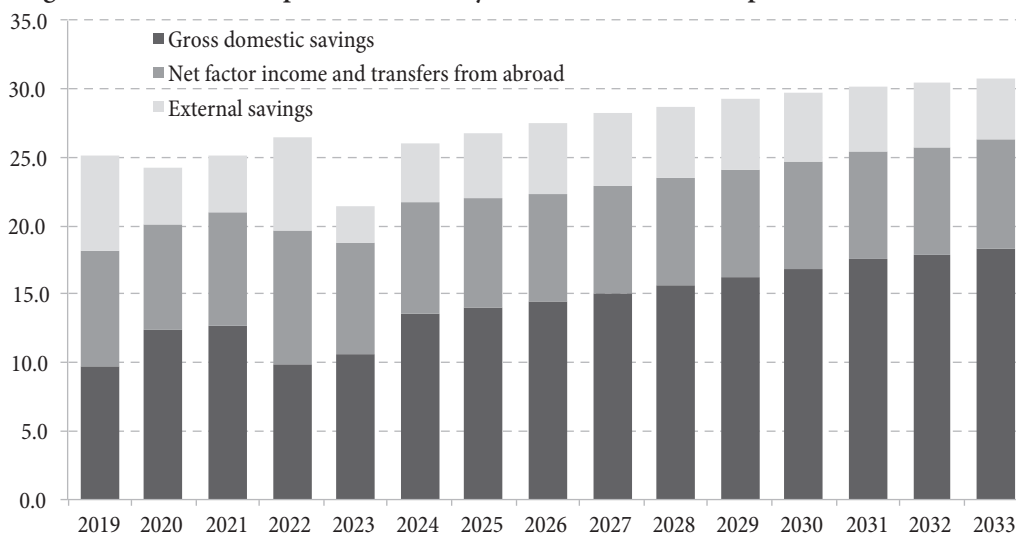
The value of those investments would rise from an estimated 19.7 billion euros in 2024 to around 28.9 billion euros in 2028 and to around 43.5 billion euros in 2033. At the same time, the share of gross domestic savings in gross fixed capital formation would gradually increase from an estimated 49.9% in 2024 to 59.8% in 2033 (Figure 2).

With the aimed proportions of net exports (at 8% over the rest of the projection horizon), final demand grows more slowly than GDP. In line with this, the following growth rates are recorded during the ten-year projection horizon: GDP of 3.9%, Final consumption of 3.3%, and GFCF of 6.7%

The residual item from setting up the target value for net exports and GFCF is household consumption. Its proportion in GDP fell from 65.7% in 2023 down to 64.2% in 2027 and 62.3% in 2033.

This means that the model also targets government spending. In the specific case, the targeted proportion of state spending in GDP, from an estimated 17.2% in 2023, drops to 15.0% in 2032 (Figure 3).

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3 State consumption is expressed as the sum of collective state consumption (a component of the expenditure side of GDP according to the System of National Accounts – SNA) and individual state consumption (also a component of the expenditure side of GDP as a part of total individual consumption – education, health, etc.). This implies that household consumption, as an aggregate of individual consumption, is reduced by the amount of individual state consumption.

Figure 2: Gross fixed capital formation by financial resources, Republic of Serbia, % GDP
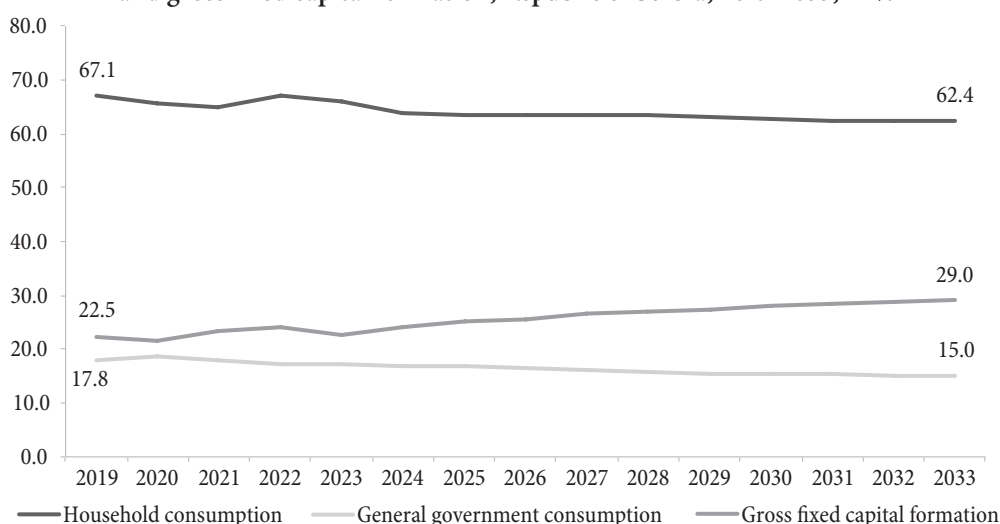

Source: Authors' calculations, SORS

The projected changes in the structure of GDP use require high import growth rates and accordingly the high level of the export target – from an estimated 59.5% in 2024 to 65% in 2033. In this structure, the dominance of consumption growth from 2022 (a consequence of the growth of domestic demand for foreign goods as well as the growth of import prices of energy sources, etc.) and 2023 is replaced by the dominance of investment growth from 2024, until the end of the projection period (Figure 4).

The next set of assumptions relates to the country's balance of payments projections. In essence, the model of macroeconomic projections used for the analysis required that a balance of payments projection model be developed first. Within this model, the following (main) target parameters were set: raising the proportion of goods and services exports in GDP to 65% in 2033 (Figure 5) and restricting the fall of number of months in which foreign exchange reserves will be enough to cover the country's imports to about 4.2 months by the end of the projection horizon.

Also, it is projected that in the period 2024-2033 the cumulative net inflow of capital based on foreign direct investments will reach 55.6 billion euros. In the same period, the cumulative amount of the deficit of current transactions is around 51.4 billion euros, which did not

Figure 3: Household and general government consumption, and gross fixed capital formation, Republic of Serbia, 2019-2033, in %

Figure 4: Year-on-year real growth of GDP, GFCF and consumption, Republic of Serbia, 2019-2033, %
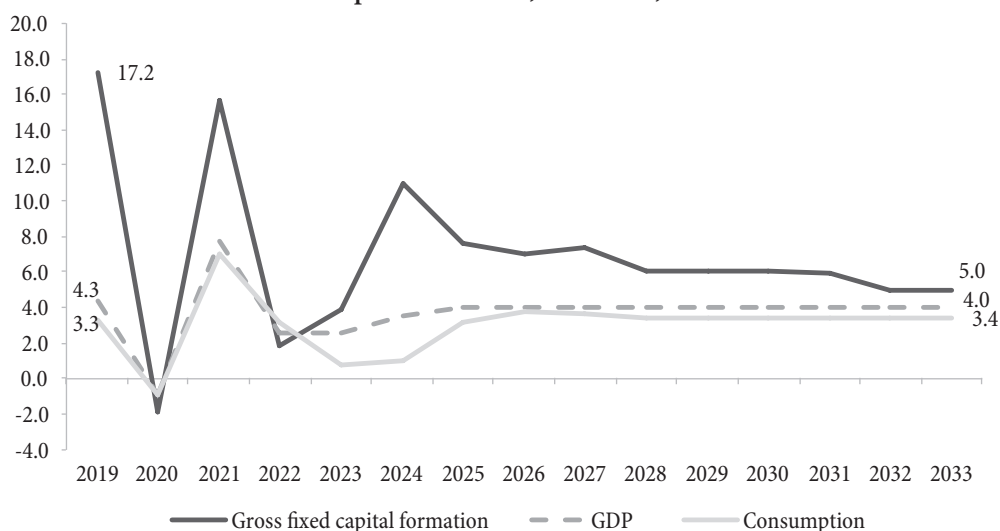
Source: Authors' calculations, SORS

take into account possible donations, which would have eased the situation.

Based on the provided macroeconomic forecasts for GDP and its components of expenditure and balance of payments, the fiscal projections for the period 2024-2033 were calculated.

The greatest attention is paid to the projections of the most significant items of the revenues and expenditures inside the budget – the items with the largest shares in budget revenues and expenditures. Thus, on the revenue side, it was necessary to forecast the movement of income from value added tax as precisely as possible, bearing in mind the largest share of this item in total income. Since this type of tax belongs to consumption taxes, its movement is presumed to follow domestic demand. Additionally, total revenues from VAT consist of importing VAT and VAT from the domestic market. In this regard, it was assumed in the forecasts that VAT incomes from imports will move in accordance with the movement of imports (the corrective element is a coefficient that reflects the relationship between the dynamics of exports and imports, as exported goods are liable to VAT refunds). VAT-based income for the domestic market is determined by subtracting VAT-based income from imports from the overall VAT-based income. In addition, the projection for customs duties income is based on import growth rates, while other revenue items in the budget are presumed to correlate with GDP movements [10].

Regarding budget expenditures, projections were based on anticipated growth rates in consumption by the general government sector. This primarily includes expenses related to consumption, such as employee remuneration, budgetary transfers (with the largest portion going to the Pension and Disability Fund), and social benefits. Additionally, capital expenditures are expected to align with a targeted share of 5.5% of GDP. When estimating pension costs, we considered an upper limit based on fiscal rules outlined in the 2023 Law on the Budget System. According to these rules, the total amount of pensions paid should not exceed 10% of GDP. This means that the government aims to control and limit the proportion of GDP allocated to pension payments. Thus, if these expenses and the monetary amount as an increase for pension are between 10% and 10.5% of GDP, the pension is adjusted to the sum of half of the change in the average salary without taxes and contributions and half of the change in consumer prices. Furthermore, if the total expenditure for pensions and the monetary amount as a pension increase are equal to or greater than 10.5% of GDP, the pension is adjusted only to consumer prices, that is, there is no real increase in pensions, but only their real value is maintained. These set rules for adjusting pensions represent a form of macroeconomic

Figure 5: Current transactions deficit, Republic of Serbia, 2019-2033, % of GDP
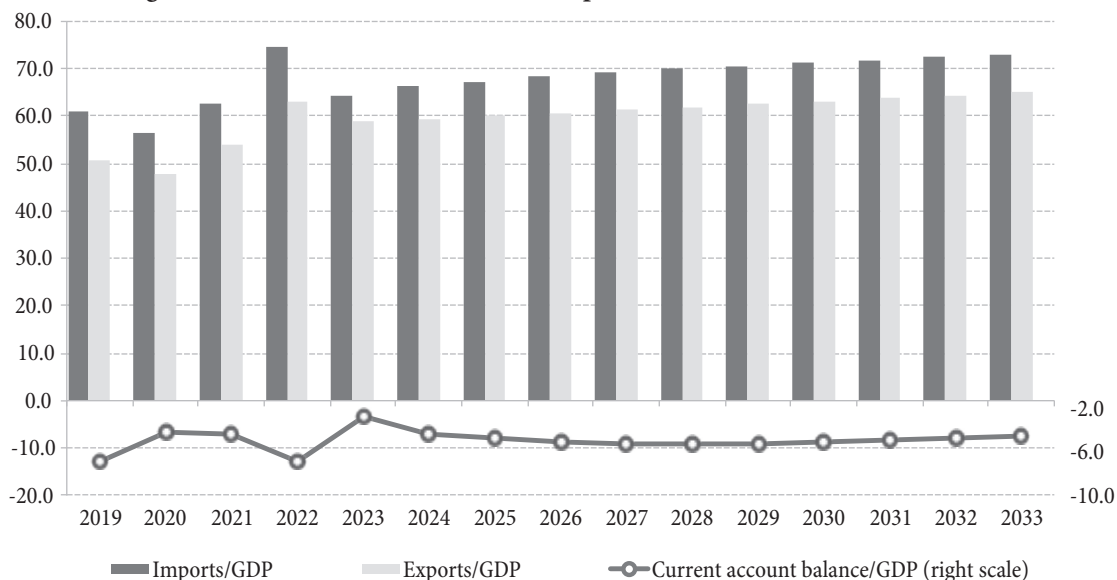
Source: Authors' calculations, SORS

automatic stabilizer. Their goal is to provide for the fiscal sustainability of the pension system. When it comes to the proportion of general government salaries in GDP, according to the new fiscal rules, a new upper limit of 10% has been set. In summary, the concept of automatic stabilizers is introduced to highlight the system's ability to adapt to economic conditions without constant manual adjustments. Also, the SORS demographic projections on the population size for the corresponding age groups were taken into account as a benchmark (65+) so as to provide for additional control of the acceptability of the obtained fiscal projections.

Assuming no changes to existing tax rates, the proportion of consolidated public revenues in GDP will equalize at 41.1%. Simultaneously, public expenditures as a percentage of GDP are projected to decline from an estimated 45.7% in 2023 to approximately 40.0% by 2033. This reduction would lead to a budget surplus equivalent to around 0.5% of GDP at the end of the projection period. To promote economic growth, a substantial increase in public infrastructure investments is recommended. These investments would not only have direct effects but also indirectly stimulate private investment growth. As part of this strategy, the target share for public investments has been set at 5.5% of GDP by the end of the projection horizon, with the aim of ensuring a downward trajectory for public debt.

Although the estimated share of public investments reached 7.2% of GDP in 2023, a gradual decrease of this share in the following period is advised so that the sustainability of the public debt is not threatened. Otherwise, such high shares of public investments would require additional external borrowing of the country. This must be considered as Serbia is preparing for Expo 2027. According to fiscal projections, it should be expected that the target share of public investments of 5.5% will be reached in 2029, remaining as such over the entire remaining period of projections.

The starting position in 2023 is a fiscal deficit of 2.8% of GDP as a result of high allocations for the acquisition of financial assets, intended to overcome the negative effects of the energy crisis. In 2024, it is estimated to be at 2.4% of GDP. In the following period, a gradual reduction of this deficit would follow, so that a surplus of 0.2% of GDP would be achieved from 2033. This result stems from the premise fitted into the projecting of expenditure elements of the GDP, which concern the adjustment of public spending, that is, the relative decline (compared to GDP) of current public spending. Namely, one of the assumptions of the model is the reduction of the percentage of state spending in GDP from an estimated 17.0% in 2024 to 15.0% in 2033. However, in the initial years of the projecting period, due to overdue repayments based on foreign borrowing, as well as the fact that the main components of public spending – salaries in the public sector (from the budget) and pensions – are difficult to adjust, fiscal deficits would still be recorded [7, p. 18].

Results of baseline scenario and risks attached to its implementation

The overall sustainability of a particular economic development scenario faces its greatest risk in terms of external debt sustainability and liquidity. In the relevant macroeconomic literature, various indicators are employed to analyse external debt sustainability. For the sake of this paper, we focus on three specific groups of indicators: (i) external liquidity, (ii) external solvency, and (iii) measures of national economic openness.

As for external liquidity, we start with Total external debt service ratio which is defined as a proportion of capital and interest repayment in exports of goods and services.

In 2023, the debt service ratio is estimated to be 16.2%. By 2024, it is projected to decrease to approximately 14.0%. These elevated rates result from obligations (including interest and capital) stemming from earlier indebtedness. Subsequently, the ratio tends to decline annually, except for 2027 and 2029, when it rises by 0.5 percentage point and 0.3 percentage point from the previous years, respectively. In the final year of the ten-year projecting period, the ratio reaches 7.0%. During the initial years of the projection, there is a notable risk of heavy external debt repayment burdens. Addressing this risk requires robust investment activity, driven by substantial growth in domestic savings for financing investments, followed by foreign direct investment.

The second indicator within this group is Foreign exchange reserves by months of imports which specifies the number of months during which a country can sustain the ongoing volume of imports in case all inflows are halted.

The coverage of goods and services imports by foreign exchange reserves is expected to decrease from an estimated 6.3 months in 2024 to approximately 4.2 months in 2033. This adjustment aligns with the reduced risk related to external liquidity (Figure 6).

The changes in the foreign exchange reserves-to-imports ratio take into account robust external liquidity and the country's credit rating, which facilitates more cost-effective borrowing (lower capital costs). In line with Standard & Poor's methodology, Serbia's current credit rating for long-term borrowing stands at BB with a positive outlook.

Assuming unchanged conditions, replacing the consumption-oriented development scenario with a pro-investment approach (the baseline scenario) and shifting investment focus toward tradable goods can lead Serbia to attain an investment-grade credit rating. This achievement would grant access to more affordable capital for financing the chosen growth and development model. However, it is worth noting that due to a significant inflation surge in certain major global economies, central banks are likely to raise their key interest rates.

Regarding External solvency of the country, the obtained results show that the external debt-to-exports ratio in 2024 stands at 107.0%, which falls within sustainability limits of 220%. Over the projection period, this ratio gradually decreases, reaching 62.6% by 2033. This trend reflects a positive trajectory in managing external debt relative to exports of goods and services. The next indicator

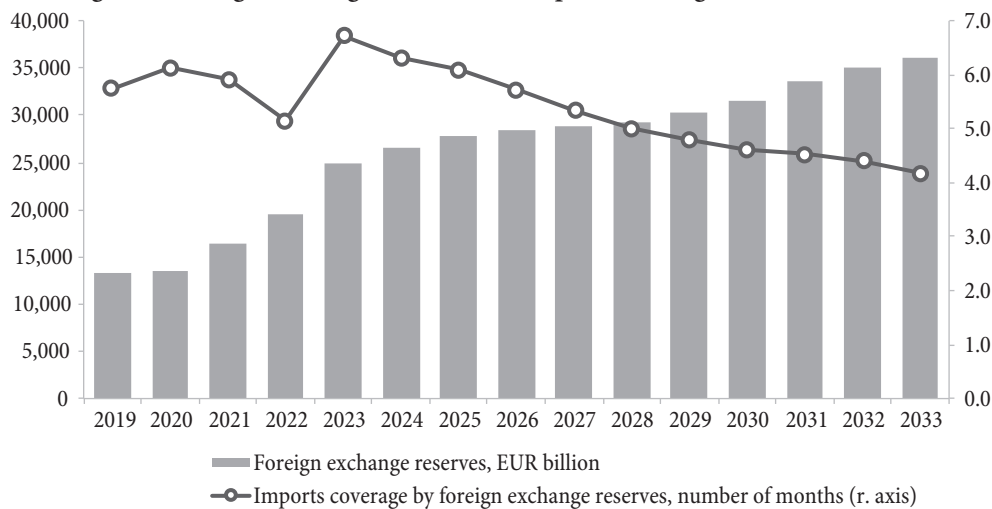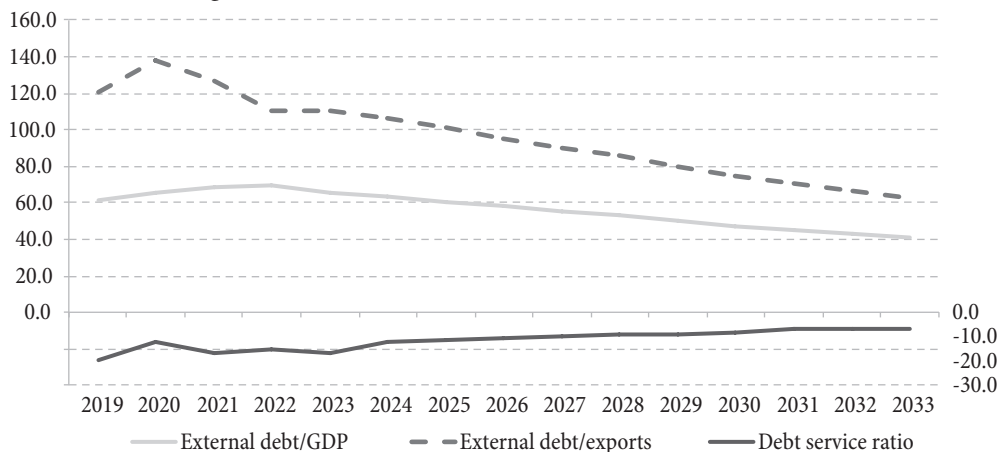**Figure 6: Foreign exchange reserves and imports coverage, 2019-2033, GDP %**

Foreign exchange reserves, EUR billion
Imports coverage by foreign exchange reserves, number of months (r. axis)

Figure 7: External indebtedness indicators, 2019-2033, %

External debt/GDP   External debt/exports   Debt service ratio

Source: Authors' calculations, SORS

of the external solvency is an external debt-to-GDP ratio. According to the results of the projections, while the absolute value of external debt is increasing annually, its relative share in GDP has declined to 40.7% (Figure 7).

In this paper, the trade openness of the country is described with the help of two indicators – Foreign direct investment-to-GDP ratio and External trade-to-GDP ratio. Thus, in 2024, foreign direct investment (FDI) is projected to constitute 6.0% of GDP. However, by 2029, this share is expected to gradually decline to 5.0% and remain so by the end of 2033. The reduction in FDI share during the later years of the projection horizon is attributed to potential profit outflows. The projected net FDI inflow for the period from 2024 to 2033 amounts to EUR 55.6 billion. Conversely, the cumulative deficit of current transactions during the same period totals nearly EUR 51.4 billion.

Additionally, the degree of economic openness, as measured by the external trade-to-GDP ratio (which combines exports and imports), is expected to rise from an estimated 120.6% in 2024 to 139.0% in 2033. This indicates a high level of trade openness throughout the entire period of projections.

Regarding risks that may produce deteriorating macroeconomic conditions and as a result jeopardize a chosen model of economic development, it is useful to distinguish between two types of risks: international environment risks and internal risks. The former includes potential challenges such as geopolitical tensions, climate change, pandemics, cybersecurity threats, etc. These adversities have the potential to create uncertainty, causing reduced investor confidence and their reluctance to invest abroad. As a result of this, countries which still relies upon foreign investments, such as Serbia, may find themselves in a situation where investors withdraw their capital – such capital outflow can lead to debt crisis. Internal risks, on the other hand, may involve the country opting for consumption-driven growth model instead of pro-investment model, declining FDI inflows, external debt payment issues, unfavourable demographic trends such as falling birth rates and an aging working-age population, as well as political risks.

External debt dynamics and factors generating Serbia's external debt

In this part of the paper, the basic flows that lead to changes in external debt are shown, as well as their contribution to changes in the country's relative indebtedness in the baseline development scenario.

Figure 8: Dynamics of the External Debt and its drivers – contributions to the change in the external debt as GDP % – historical data for Serbia, 2014-2023, %
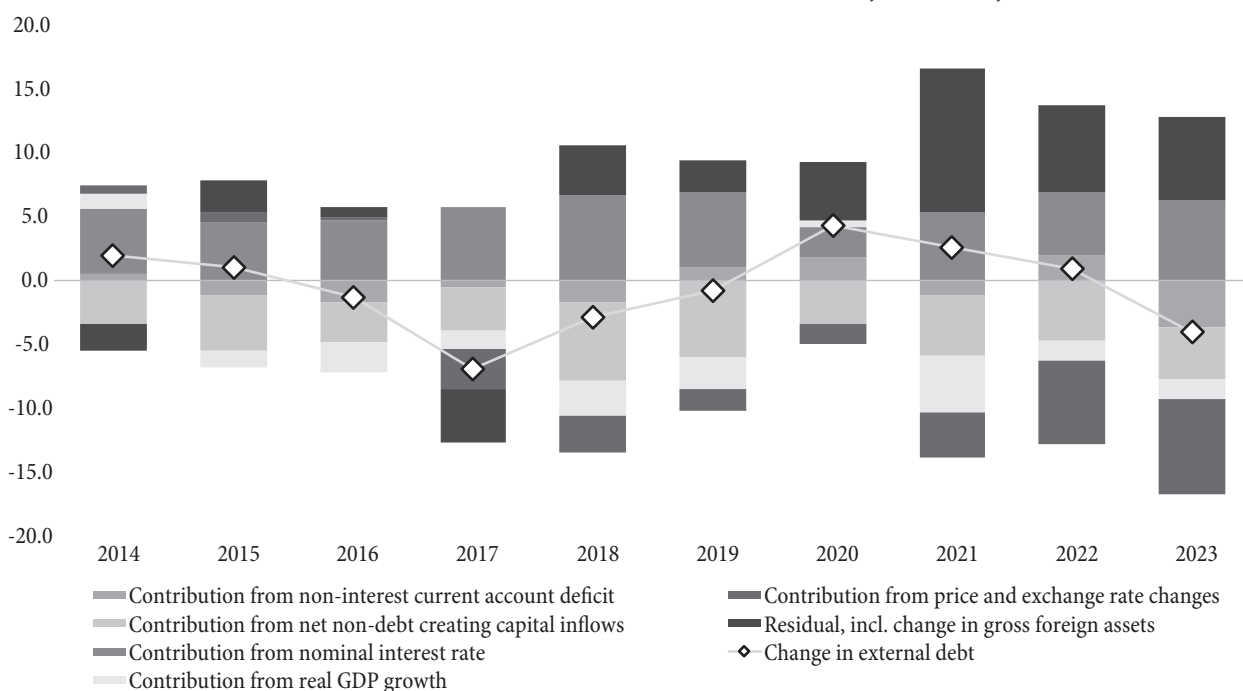
Source: Authors' calculations, SORS

According to the obtained results, in the baseline scenario there is a softening of the flows that create changes in the share of external debt in the future, which leads to the conclusion about the sustainability of Serbian external debt. However, residual trends had a strong influence on the dynamics of Serbia's relative indebtedness in the historical period from 2014 to 2023 (Figure 8). Their contribution to the movement of the share of external debt was mostly positive (except in 2014 and 2017 when it was negative), while in some years it was dominant (in 2020, 2021 and 2022).

Given that residual flows are considered to be everything that contributes to a change in the country's relative indebtedness, and cannot be irrefutably explained by statistically recorded macroeconomic flows that cause the creation of external debt, it can be assumed that the increase in the share of external debt in GDP, which cannot be explained, results from challenges in the statistical measuring of the public sector activities, or problems arising from the application of the cash flow principle in general government financial statistics. This is particularly true of public debt. In addition, the residuals are probably also a consequence of the change in the ratio of the exchange rates of the currencies from which the debt is composed – namely, it is possible for
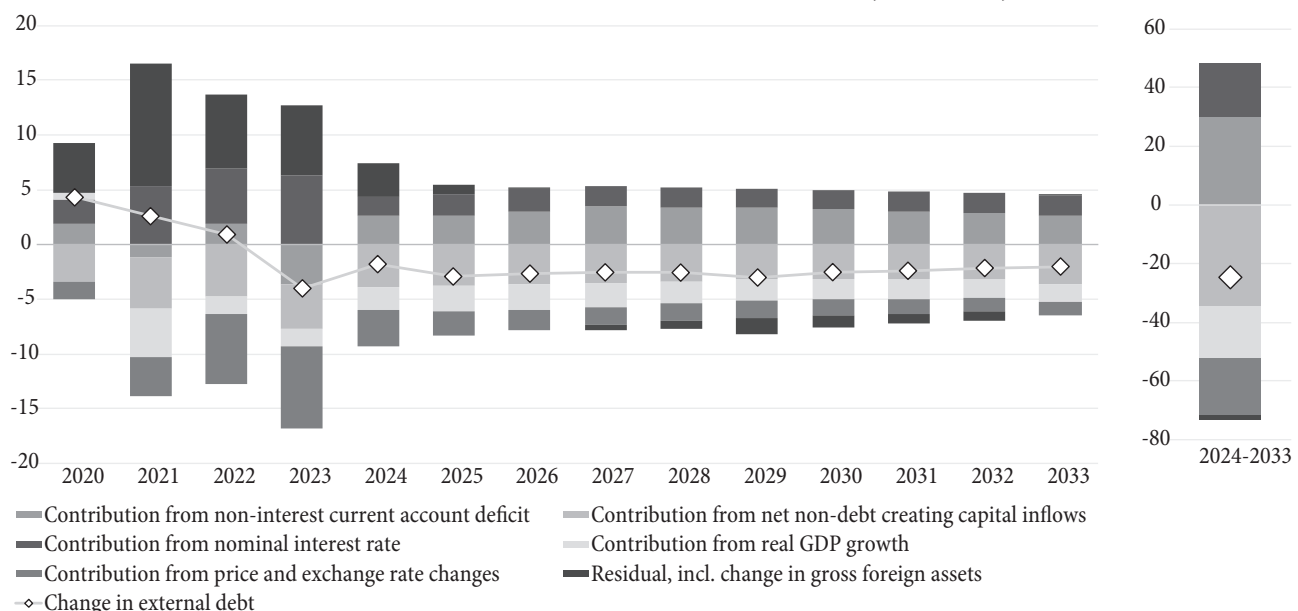
a change in the debt expressed in one currency to occur without a corresponding change in the flows that cause the creation of external debt.

The projections were based on the assumption that these residual flows w weaken in the future because their better statistical coverage is expected, as well as the stabilization of the relationship between the main currencies (primarily between the euro and the US dollar).

The increase in the share of external debt in GDP during 2022 is mainly due to a larger than expected current account deficit (6.9% of GDP) and lower GDP growth (2.5%). However, according to the baseline scenario (Figure 9), it is expected that in the coming years the current account will improve and reach a deficit of 4.5% of GDP by 2033. At the same time, it is expected that after 2025, economic growth will reach a rate of 4% per year and remain on that trajectory by the end of 2033. Therefore, the resulting debt-to-GDP trajectory can be considered sustainable.

Regarding sensitivity analysis, it involves comparing the trajectory of the share of external debt (dt) obtained in the baseline scenario with the trajectories obtained in different scenarios. In this case, the sensitivity analysis consists of two alternative scenarios and four band tests (Table 2).

Figure 9: Dynamics of the External Debt and its drivers – contributions to the change in the external debt as GDP % in the baseline scenario, 2020-2033, %

Contribution from non-interest current account deficit
Contribution from net non-debt creating capital inflows
Contribution from nominal interest rate
Contribution from real GDP growth
Contribution from price and exchange rate changes
Residual, incl. change in gross foreign assets
Change in external debt

Source: Authors' calculations, SORS

Results of the stress tests for the share of external debt in GDP

The results of the External Debt sustainability analysis provided in the previous section indicate that Serbia is at a moderate debt risk and that the external debt is sustainable. The external debt is on a sustainable path in the baseline scenario, and the results of stress tests show that debt dynamics are resistant to individual shocks (changes in interest rates, real GDP growth rates, GDP deflators and to a lesser extent in the deficit of the non-interest-bearing current account of the balance of payments). Nevertheless, the outlook for external debt is particularly sensitive to the shock of a one-time depreciation of the dinar (a sudden jump to 85.6% in 2026) and combined permanent shocks (heuristic variant and Test 5, see Table 2), which can lead to unsustainable trajectories and thus the need for the reprogramming the country's debt in the medium term. A similar situation is in case of the second scenario, which combines shocks on several key variables, adding the assumption of a change in FDI inflows, analogous to the approach in the heuristic model of the authors for the pessimistic scenario. This scenario is based on the disturbance of the GDP growth rate, the inflow of foreign direct investments, the nominal interest rate on external debt, the exchange rate, and the inflation (through the GDP deflator in euros), and the deficit of the non-interest-bearing current account of the balance of payments. In such a situation, the share of external debt in GDP grows throughout the entire projection period, with a significant increase in the share of debt reaching 71.4 % of GDP in 2033, which is still below the limit of the IMF and WB (dark grey line in Figure 10).

Namely, the poor performance of exports and the further growth of the current account deficit, together with the depreciation of the dinar, may threaten the sustainability of the debt. Decision-makers should therefore monitor trends in external debt indicators such as interest rates on external debt, real growth rate of GDP, exchange rate change, deterioration of the Current Account of Balance of Payment as well as their combined influence. Uncertainty regarding the global economic perspective and the consequences of the war in Ukraine will also have negative implications for a large number of countries,

Table 2: Sensitivity analysis – definition of alternative scenarios and description of the band tests

Alternative scenarios	Description
Scenario 1	All key variables remain at the 10-year historical average over the projection period (2024-2033) 1/
Scenario 2	Combined shocks on the variables with the inclusion of changes in FDI following the approach in setting the pessimistic variant in the author's heuristic model 2/
Bound tests	
Test 1	Increase in the interest rate on external debt by one standard deviation* compared to the base scenario during the projection period (2024-2033).
Test 2	Reduction of the real GDP growth rate by one standard deviation* compared to the baseline scenario during the projection period (2024-2033).
Test 3	Shock of the GDP deflator in euro terms for half a standard deviation* of the deflator in dinars and the exchange rate compared to the base scenario during the projection period (2024-2033).
Test 4	An increase in the deficit of the non-interest-bearing current account by one standard deviation* of the dinar deflator and the exchange rate compared to the baseline scenario during the projection period (2024-2033).
Test 5	Combined shocks of previous scenarios – growth rates of real GDP and non-interest-bearing current account deficit in the amount of 1/2 standard deviation*, and interest rates and GDP deflator in EUR in the amount of 1/4 of a standard deviation* compared to the basic scenario during the period projection (2024-2033).
Test 6	One-time depreciation of the dinar of 30% in 2026

* The standard deviation is calculated based on historical data over the past 10 years.

1/ Scenario of historical averages – interest rate on external debt, real GDP growth rate, GDP deflator growth in euro, non-interest-bearing current account deficit of the balance of payments and flows that do not create external debt as a % of GDP are expressed according to their historical values in period from 2014 to 2023.

2/ Under this scenario, the standard test with combined shocks is extended with the change in FDI. Thus, the real GDP growth rate and the non-interest-bearing current account deficit remain half a standard deviation below the 10-year historical average; the interest rate on external debt, the share of net FDI inflows, and the growth of the GDP deflator in EUR remain 1/4 of a percentage point below the 10-year historical average.

Source: Authors' calculations, SORS

especially net energy importers – Serbia belongs to this group. At the same time, it is expected that EU economies will record significantly lower growth rates, potentially resulting in reduced foreign demand for Serbian goods and services. To ensure debt sustainability and prevent the need for sudden macroeconomic policy corrections, decision-makers should carefully manage public finances and external borrowing.

Currently, foreign exchange reserves are adequate and provide sufficient reserves to mitigate the impact of external shocks. However, policymakers should remain committed to sound macroeconomic policies and further build buffers to avoid debt problems. More importantly, to meet the country's fiscal needs without jeopardizing debt sustainability, further efforts are needed to strengthen public debt management, create additional fiscal space to increase productive investments at the expense of unproductive consumption. It is also necessary to further adjust structural policies with the aim of increasing the competitiveness of the national economy, greater

participation of private investments in total investments, as well as greater commitment to institutional reforms (primarily regarding judiciary, education, and health system). This is important to ensure that the debt trajectory remains sustainable.

The dynamics of the share of external debt in GDP according to the baseline scenario is shown by the black line in Figure 10.

Deviation from the baseline projection – pessimistic scenario of economic growth: As a replacement for the concluding remarks

In contrast to the baseline scenario, the alternative outlook predicts slower economic growth. The annual growth rate from 2024 to 2033 is projected to be 2.0% in average. Additionally, the alternative scenario assumes an increasing share of the current transactions deficit in GDP, rising from 4.3% in 2024 to 6.4% in 2033.

Figure 10: Share of external debt in GDP in selected scenarios (two alternative scenarios and six band tests)*
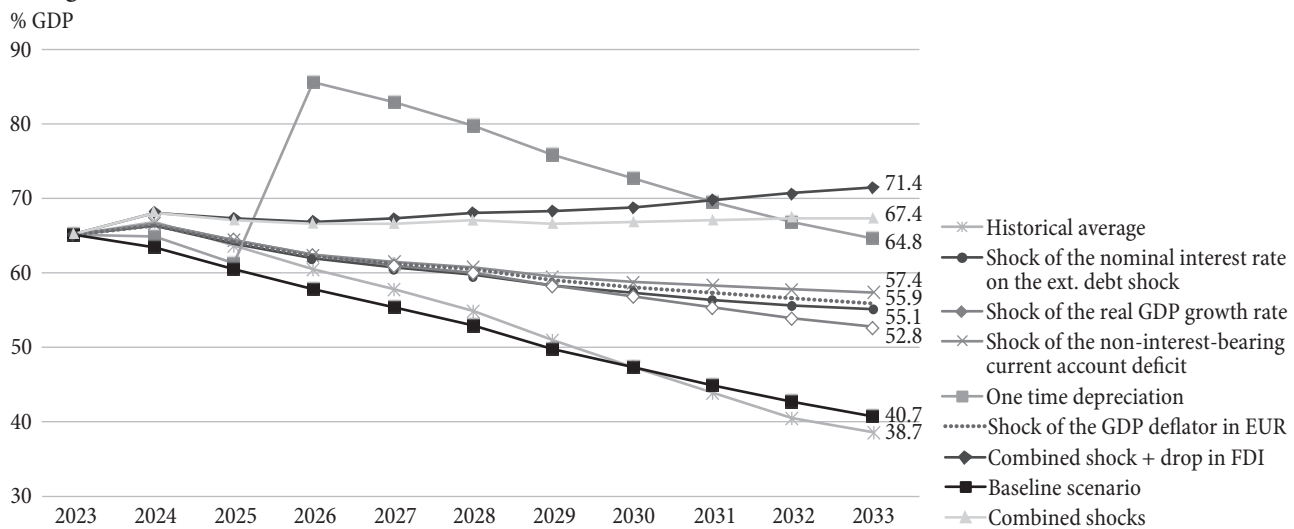
Source: Authors' calculations, SORS

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* *Combined shocks* in Figure 10 implies the combination of the following shocks: the real GDP growth rate and the non-interest-bearing current account deficit remain half a standard deviation below the 10-year historical average; the interest rate on external debt, the share of net FDI inflows, and the growth of the GDP deflator in EUR remain 1/4 of a percentage point below the 10-year historical average.

However, all the elements of Figure 10 are elaborated in Table 2.

The term *"non-interest bearing"* indicates that the deficit does not result in additional interest payments or debt service costs. In some cases, a country may be able to sustain a non-interest-bearing current account deficit in whole or in part if it is financed through non-debt creating means, such as foreign direct investment, foreign aid, or other forms of capital flows that do not require interest payments.

Inward Unilateral Transfers are transfers of money, goods, or services that flow into a country without the expectation of a quid pro quo. Inward unilateral transfers typically include items such as foreign aid, grants, remittances from overseas workers, and gifts. These transfers contribute positively to the receiving country's balance of payments. Conversely, *outward unilateral transfers* are transfers of resources or funds that a country makes to another country without expecting anything in return. This category includes foreign aid provided by the country, grants given to other nations, and other forms of assistance that involve the outflow of resources. Outward unilateral transfers have a negative impact on the country's balance of payments.

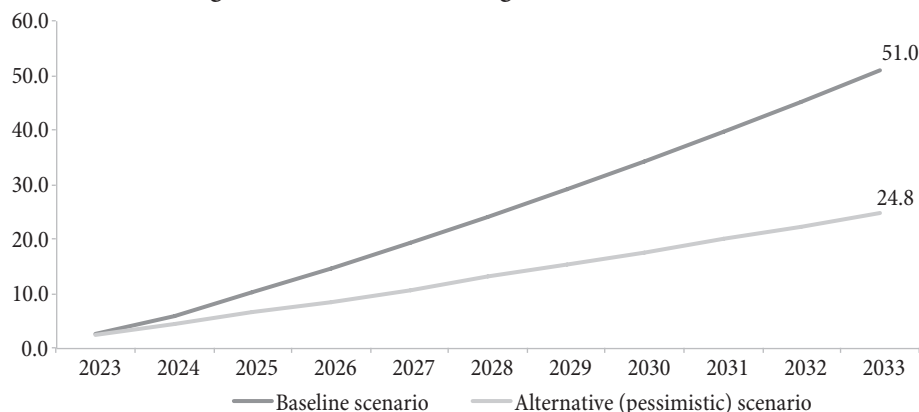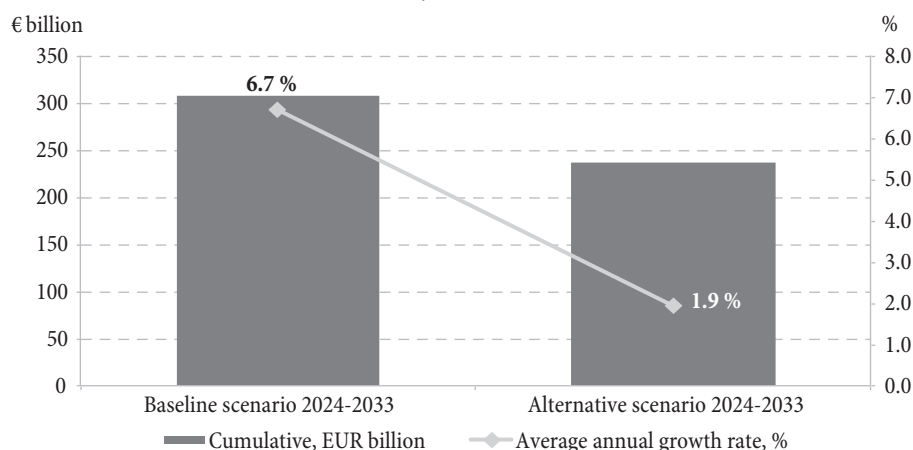**Figure 11: Cumulative GDP growth, 2024-2033, %**

Figure 12: Gross fixed investments – cumulative and average annual growth rate, 2024-2033

Source: Authors' calculations, SORS

Targeted variables in the pessimistic development scenario include:

- Fixed investments maintaining a level of 23.7% GDP in 2024 until 2027, gradually declining to 22% GDP by 2033 (average annual growth of 1.9%)
- State consumption remaining at 17.0% of GDP throughout the entire projecting period
- Exports of goods and services decreasing from 59.5% GDP in 2024 to 55.0% GDP in 2033.
- A growing deficit in current transactions, reaching 6.4% of GDP by 2033.

Net exports are targeted at 7% throughout the projection, resulting in faster growth of final demands compared to GDP. The average annual growth rates for 2024-2033 are as follows: GDP with 2.0%, final consumption with 2.1%, and investments with 1.9%.

The alternative scenario, characterized by a low average annual growth rate of 2.0% and increased consumption, leads to inflation and RSD depreciation. By 2025, foreign exchange reserves would decline, reaching only 3.2 months of import coverage (from an initial 6.0 months). Borrowing at high interest rates becomes an alternative to depleting reserves. Consequently, external liquidity weakens, impacting long-term solvency. In this scenario, the external debt-to-exports ratio would reach 110.2% in 2033, with external debt comprising 61.8% of GDP. Reduced exports (from 59.5% in 2024 to 55.0% in 2033) contribute to decreased economic openness (from 125.3% to 118.0%). The deficit challenges economic structure and competitiveness. Lower GDP growth (2.0% vs. 3.9%) limits consumption growth to 2.1% annually. The alternative scenario predicts a decrease of EUR 6.9 billion in real GDP (at constant 2023 prices)[4] from 2024 to 2033 (Figure 11).

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4 For further explanations on GDP calculations in constant prices see Kovacević & Stevović [10].

Figure 13: Foreign exchange reserves – cumulative and imports of goods and services, 2024-2033
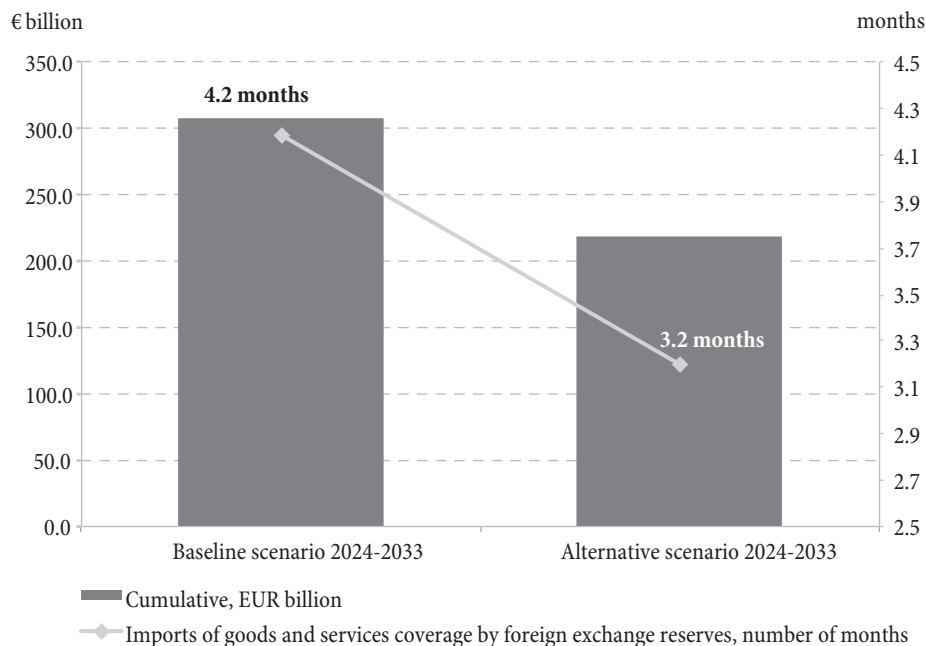
Source: Authors' calculations, SORS

In the alternative scenario, investment growth averages approximately 1.9% annually, significantly lower than the baseline projection of 6.7% (Figure 12). As a result, cumulative investments over the projection period would decrease by EUR 71.0 billion. At the same time, the amount of cumulative foreign direct investment (FDI), would be reduced by approximately EUR 11.6 billion.

As shown in Figure 13, the amount of foreign exchange reserves would fall by EUR 87.9 billion compared to the baseline scenario. Simultaneously, they would be enough for approximately 3.2 months which contrasts with the 4.2 months projected in the baseline scenario.

In the alternative scenario, rather than depleting foreign exchange reserves, the country may resort to borrowing at high interest rates. However, this approach risks breaking external liquidity due to those elevated rates. Over the long term, the country's external solvency would deteriorate. Specifically, in the alternative scenario, the external debt-to-exports ratio would reach 110.2% by 2033, with external debt constituting 61.8% of GDP. Given this context, Serbia, still in the midst of reforms, must navigate two interconnected U-turns for sustainable growth. The first shift involves moving from consumption-driven to pro-investment and export-led economic growth. Simultaneously, accelerated reforms and European integration are essential for achieving this new growth model [9, p. 25].

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