

## FISCAL SUSTAINABILITY IN ROMANIA: EMPIRICAL EVIDENCE FROM A SIMPLE DEBT DYNAMICS MODEL

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### Abstract

*This paper examines fiscal sustainability in Romania by combining the recent institutional context with a replicable annual regression based on public data. The descriptive section shows that Romania entered 2024-2025 with the widest budget deficit in the European Union and with a rapidly rising debt burden, while medium-term consolidation remains politically and economically demanding. The empirical section estimates a simple debt-dynamics equation for annual data, where the public debt ratio is explained by its own lag and by real GDP growth. Using annual observations for 1999-2022, the model indicates strong debt persistence and a statistically significant negative association between real growth and the debt ratio. The results are consistent with the recent literature on Romania, which argues that debt sustainability depends not only on current borrowing levels but also on growth resilience, fiscal credibility, and the implementation of multiannual correction plans. The article contributes a journal-style version of the case study by adding a real Excel-based dataset, a transparent regression output table, and a set of references that are verifiable and suitable for academic use.*

**Keywords:** fiscal sustainability, Romania, public debt, economic growth, regression analysis, budget deficit

**JEL classification:** G17, G31, G59

### 1. Introduction

Fiscal sustainability has become one of the most pressing macroeconomic issues in Romania. Romania is a particularly relevant case. Eurostat reported that the EU deficit-to-GDP ratio improved to 3.1% in 2024, while the EU debt ratio stood at 80.7% of GDP at the end of 2024. In contrast, Romania recorded the widest deficit in the Union in 2024, at 9.3% of GDP, and remained under intense pressure to restore credibility under the excessive deficit framework (Eurostat, 2025; Reuters, 2025a; Trading Economics, 2026).

At the same time, the macroeconomic context has become less forgiving. According to the World Bank, Romania's GDP growth slowed to 0.9% in 2024, and the OECD's 2026 survey argues that a sustained consolidation path is necessary to stabilize the public debt ratio over the medium term (World Bank, 2025; OECD, 2026). These developments make Romania a strong case study for discussing how debt evolves when deficits remain high and growth loses momentum.

The aim of this paper is twofold. First, it updates the descriptive analysis of Romania's fiscal position using current official and institutional sources. Second, it adds a simple but real econometric exercise based on annual data that can be replicated in Excel. The empirical model does not claim to exhaust the determinants of debt sustainability; instead, it provides a transparent statistical illustration of two mechanisms that recur in both theory and practice: debt inertia and the role of economic growth in easing debt dynamics.

## 2. Literature Review

Fiscal sustainability is commonly framed through the intertemporal budget constraint and fiscal reaction functions (Bohn, 1998; Blanchard et al., 1990).

Eyraud and Wu (2015) argue that well-designed rules matter most when they are accompanied by enforceable monitoring and realistic adjustment paths. The European Commission's Debt Sustainability Monitor similarly underlines that risks cannot be inferred from debt levels alone; growth, interest rates and primary balances shape the trajectory jointly (European Commission, 2024).

For Romania, the literature has become more focused after the pandemic and the subsequent shocks linked to inflation, energy prices and the war in Ukraine. Recent studies for Romania highlight increased vulnerability of debt dynamics in the post-pandemic period (Dobrotă, 2024; Grosu, 2024; Ichim, 2024).

These country-specific contributions are complemented by institutional assessments. The Fiscal Council's annual reports repeatedly argue that Romania combines structural revenue weakness with rigid expenditure commitments, while the IMF's 2025 technical assistance note on tax design concludes that revenue mobilization is indispensable if the deficit is to be brought back to a sustainable path. The OECD's 2026 survey arrives at a similar conclusion: stabilization of the debt ratio requires full implementation of an ambitious consolidation strategy.

## 3. Data and Methodology

The empirical component uses annual public data assembled in an Excel workbook delivered alongside this article. The dependent variable is Romania's central government debt as a share of GDP, taken from the World Bank series published through FRED. Real GDP is taken from the Penn World Table series published through FRED; annual real GDP growth is calculated as the year-on-year percentage change of that series. The regression sample covers 1999-2022 because the model includes the lagged debt ratio and because this is the longest consistent span available from the chosen sources without mixing revised annual ESA data, quarterly extrapolations or forecast values.

The estimated model is a simple debt dynamics equation:

$$\text{Debt}_t = \alpha + \beta_1 \text{Debt}_{(t-1)} + \beta_2 \text{Growth}_t + \varepsilon_t \quad (1)$$

Because the sample is annual and relatively small, the regression should be interpreted as a structural illustration rather than as a fully specified macro-fiscal forecasting model. The results are nonetheless informative, especially when read together with the recent descriptive evidence that Romania's fiscal position worsened markedly after 2022.

## 4. Updated Fiscal Context of Romania

Eurostat reported that the EU general government deficit improved to 3.1% of GDP in 2024, whereas Romania reached 9.3%, the widest deficit in the Union (Eurostat, 2025; Trading Economics, 2026). Reuters reported in June 2025 that the European Commission had stepped up disciplinary action because Romania had not taken effective corrective measures and because the projected adjustment remained too slow (Reuters, 2025a).

Debt dynamics have also worsened. Trading Economics reports that Romania's government debt ratio reached 54.8% of GDP in 2024, while the Ministry of Finance investor material from late 2024 already described a difficult adjustment trajectory and rising financing needs (Trading Economics, 2026; Ministry of Finance, 2024). OECD (2026) states explicitly that fiscal consolidation must continue beyond 2026 if the debt ratio is to stabilize.

Growth is no longer offering the same buffer as in the pre-pandemic years. The World Bank country page reports GDP growth of only 0.9% in 2024 for Romania, which mechanically makes debt stabilization harder when deficits remain large (World Bank, 2025). In debt arithmetic terms, weak growth increases the likelihood that debt remains elevated even if one-off measures temporarily improve financing conditions.

**Table 1. Selected macro-fiscal indicators for Romania and the EU**

| Indicator                          | Romania | EU average | Reference year |
|------------------------------------|---------|------------|----------------|
| General government deficit (% GDP) | 9.3     | 3.1        | 2024           |
| Government debt (% GDP)            | 54.8    | 80.7       | 2024           |
| GDP growth (%)                     | 0.9     | n/a        | 2024           |

Source: Eurostat (2025); World Bank (2025); Trading Economics (2026)

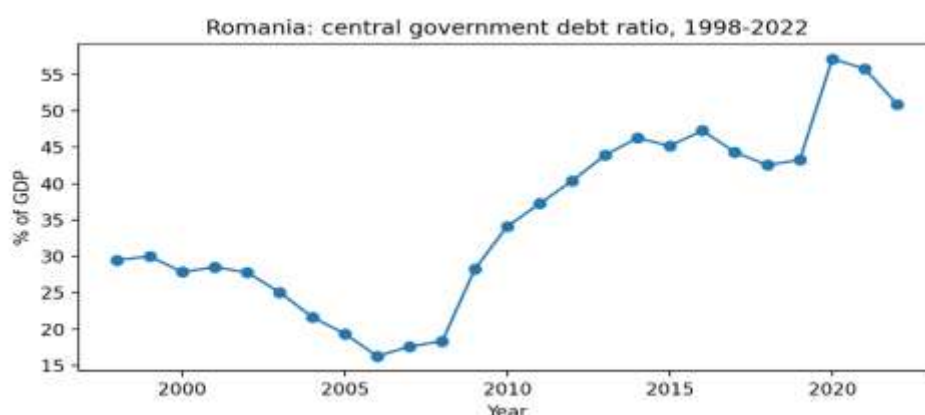


**Figure 1. Romania's central government debt ratio, 1998-2022**

Source: Eurostat (2025); World Bank (2025); Trading Economics (2026)

## 5. Empirical Results

The annual regression uses 24 observations for 1999-2022. The model fits the data well, with an R-squared of 0.947 and an adjusted R-squared of 0.942. This is not surprising: debt dynamics typically exhibit strong persistence, and Romania is no exception.

The coefficient on lagged debt is 0.954 and is highly statistically significant ( $p < 0.001$ ). This implies that debt accumulation in one year tends to carry over strongly into the next year. Put differently, once the debt ratio rises materially, reversing that increase becomes difficult without a combination of lower deficits and stronger growth.

The coefficient on GDP growth is -0.797 and is also statistically significant ( $p < 0.001$ ). The negative sign indicates that stronger real growth is associated with a lower debt ratio, other things equal. This aligns with the broader debt sustainability literature and with country-specific studies for Romania, which emphasize the importance of macroeconomic resilience in containing debt vulnerabilities (Dobrotă, 2024; Grosu, 2024).

The intercept is positive and statistically significant, but the substantive interpretation is less important than the dynamic terms. In a debt equation of this kind, the key message is that debt persistence is very strong, while growth has a meaningful offsetting role. A weak-growth environment therefore makes fiscal consolidation harder, not only politically but mechanically.

**Table 2. OLS regression results for Romania's debt dynamics**

| Variable            | Coefficient | Std. error | t-statistic | p-value |
|---------------------|-------------|------------|-------------|---------|
| Constant            | 5.339       | 1.996      | 2.675       | 0.014   |
| Lagged debt (% GDP) | 0.954       | 0.052      | 18.400      | 0.000   |
| GDP growth (%)      | -0.797      | 0.154      | -5.189      | 0.000   |

Model statistics: observations = 24; R-squared = 0.947; adjusted R-squared = 0.942; F-statistic = 188.583; Prob (F-statistic) = 0.000000; Durbin-Watson = 1.623.

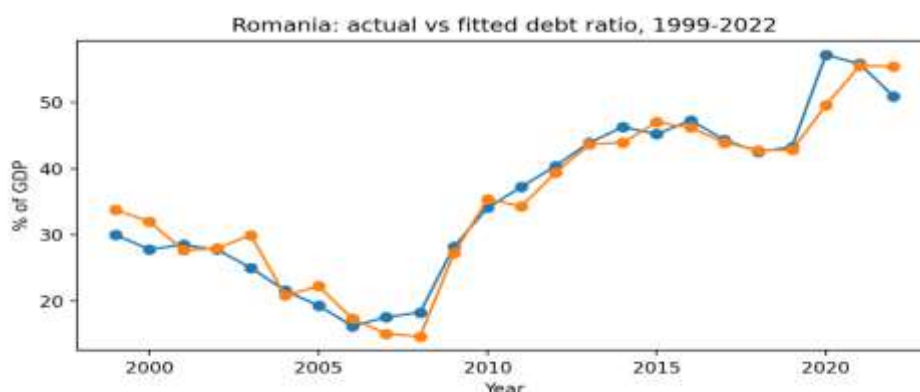


**Figure 2.** Actual versus fitted debt ratio from the annual regression  
Source: Eurostat (2025); World Bank (2025); Trading Economics (2026).

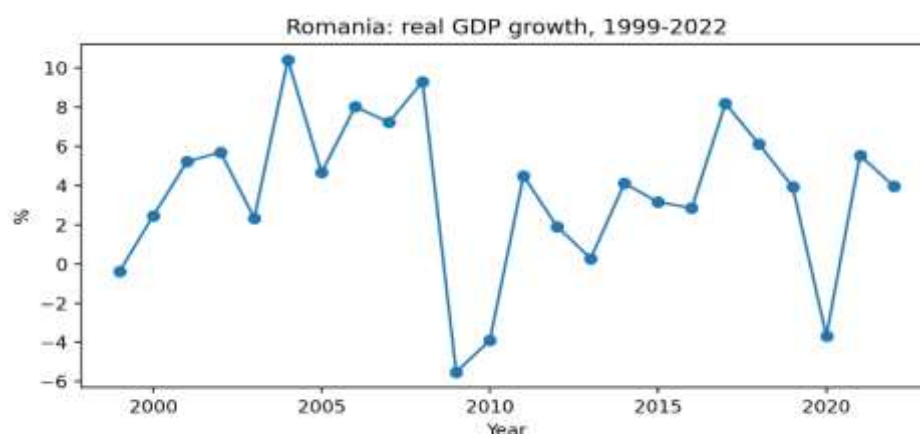


**Figure 3.** Romania's real GDP growth, 1999-2022  
Source: Eurostat (2025); World Bank (2025); Trading Economics (2026).

## 6. Discussion

The econometric exercise supports three conclusions that matter for a publishable case study. First, Romania's debt process is inertial: once debt increases sharply, its subsequent path depends heavily on that inherited level. Second, growth matters a great deal. Even a simple annual model suggests that weaker growth materially complicates debt stabilization. Third, the recent institutional context makes these dynamics more urgent, because Romania is trying to consolidate from a starting point defined by a historically large deficit.

These findings are consistent with the recent Romanian literature. Dobrotă (2024) shows that adverse shocks can push the debt ratio into clearly unsafe territory under unfavorable scenarios. Grosu (2024) argues that nonlinear patterns in Romania's debt dynamics deserve close monitoring. Ichim (2024) underlines that the speed of debt accumulation in recent years has changed the policy conversation from one of comfortable buffers to one of risk management.

## 7. Conclusions

This article updated the Romanian case study on fiscal sustainability and strengthened it in three ways: by integrating recent country-specific literature, by using current institutional evidence, and by adding a real annual regression based on an accompanying Excel dataset. The descriptive

evidence shows that Romania entered 2024-2025 with the largest deficit in the EU and with a debt trajectory that has become materially riskier than in the pre-pandemic period.

The empirical model confirms that debt persistence is strong and that real growth plays an important mitigating role. For policymakers, the implication is clear: a credible fiscal adjustment path must combine deficit reduction with measures that protect the economy's growth capacity. For researchers, the case illustrates how even a transparent, low-dimensional model can add analytical value when paired with good institutional context and clearly documented data.

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