Journal of Global Economics, Public Policy and Development

jglobed.com

Research Article

Indirect Taxation and Budget Deficit in Romania with Implications for Fiscal Sustainability

Valentin Marian Antohi[1,*], Costinela Fortea[2,3] and Luminita Popa[4]

[1]*Department of Business Administration, Dunarea de Jos University of Galati, Romania; E-mail: valentin_antohi@yahoo.com; valentin.antohi@ugal.ro.*

[2]*Department of Business Administration, Dunarea de Jos University of Galati, Romania; E-mail: costinela.fortea@yahoo.com.*

[3]*Departament of Finance, Accounting and Economic Theory, Transilvania University of Brasov, Romania; E-mail: costinela.fortea@unitbv.ro.*

[4]*Department of Business Administration, Dunarea de Jos University of Galati, Romania; E-mail: luminitapopa0721@gmail.com.*

([*]Corresponding Author)

Cite This: https://doi.org/10.65638/2979-5842.2026.1.05

ABSTRACT: Fiscal sustainability has become a major policy priority in the European Union, increasing the importance of stable revenue mobilisation and credible fiscal governance. This study examines the dynamic relationship between revenues from taxes on goods and services and Romania's general government budget balance during 2010–2025. The empirical analysis employs dynamic Ordinary Least Squares models estimated with HC3 robust standard errors. The preferred specification includes the lagged budget balance, aggregate taxes on goods and services, and inflation, while alternative models control for real GDP and the 2020–2023 crisis period. The preferred model is jointly significant and explains 76.0% of the variation in the budget balance. The results indicate significant fiscal persistence and a positive association between taxes on goods and services and the fiscal balance. Inflation is not individually significant, while the RGDP and CRISIS coefficients are also insignificant in the augmented specifications. The positive TAXGS coefficient remains directionally stable, although its statistical significance is sensitive to additional controls. The findings should therefore be interpreted as conditional dynamic associations rather than causal effects. The study contributes updated evidence on Romania's fiscal performance during a period marked by the COVID-19 pandemic, energy-market disruption, and inflationary pressures. The policy implications emphasise effective tax administration, broader compliance, expenditure discipline, carefully implemented VAT digitalisation, and predictable excise-duty reforms rather than reliance on statutory tax-rate increases alone.

Keywords: Fiscal sustainability, Budget balance, Taxes on goods and services, Indirect taxation, Fiscal persistence, Romania.

1. INTRODUCTION

Fiscal sustainability has become a central priority of economic policy in the European Union, particularly in the context of rising public debt, persistent budget deficits, demographic pressures, and the growing financing requirements associated with the green and digital transitions. The Stability and Growth Pact (European Commission, 2026c) and the European Semester (European Commission, 2026d) place renewed emphasis on maintaining sound public finances while preserving sufficient fiscal capacity to support economic development, social protection, and long-term resilience.

Received: July 09, 2026
Accepted: August 17, 2026
Published: August 20, 2026

In this context, the capacity of national tax systems to mobilise stable revenues without undermining economic activity has become increasingly important.

Indirect taxation occupies a significant position among the fiscal instruments available to governments. Taxes on goods and services generally rely on broad tax bases and can generate relatively stable and predictable revenue streams. Value Added Tax and excise duties represent major institutional components of consumption taxation across European Union Member States and contribute substantially to the financing of public expenditure (European Commission, 2026e). However, the fiscal performance of indirect taxation depends not only on statutory tax rates and formal tax design but also on the effective tax base, compliance, administrative capacity, economic activity, inflation, and public-expenditure developments (Athanasios *et al*., 2022; Sentinelo *et al*., 2025).

Romania provides a particularly relevant setting for examining these relationships. Since its accession to the European Union, the Romanian tax system has undergone substantial reforms intended to harmonise national legislation with the European acquis, improve revenue collection, and address persistent fiscal imbalances. Nevertheless, Romania's public finances have continued to face structural pressures arising from a relatively narrow effective tax base, tax-compliance challenges, expenditure rigidities, and recurrent budget deficits.

These structural challenges were intensified by several major shocks during the last decade. The COVID-19 pandemic required extensive fiscal-support measures and emergency expenditure, while subsequent energy-market disruptions and inflationary pressures increased the cost of supporting households and firms. These developments weakened the fiscal position and complicated the process of budgetary adjustment. The post-pandemic period has consequently reinforced the importance of efficient tax collection, credible expenditure management, and medium-term fiscal planning (Wen *et al*., 2025).

An important characteristic of fiscal performance is its temporal persistence. Budgetary outcomes do not adjust instantaneously because expenditure commitments, tax structures, fiscal rules, and consolidation measures extend across successive years. Current fiscal performance may therefore depend not only on contemporaneous tax revenues and macroeconomic conditions but also on the fiscal position inherited from the preceding period. Ignoring this dynamic component may provide an incomplete assessment of the mechanisms associated with the annual budget balance.

Previous studies have examined fiscal sustainability, taxation, public debt, and the macroeconomic determinants of fiscal performance from several perspectives (Balasoiu *et al*., 2023; Chifu & Păun, 2026; Cifuentes-Faura & Simionescu, 2024; Izabela Diana, 2026). However, evidence concerning the dynamic relationship between aggregate revenues from taxes on goods and services and Romania's annual budget balance remains limited, particularly for a period covering the COVID-19 pandemic, the energy crisis, and the subsequent inflationary shock.

The present study addresses this gap by examining the relationship between aggregate taxes on goods and services and Romania's general government budget balance over the period 2010-2025. TAXGS is employed as the aggregate indicator of indirect taxation. VAT and excise duties are not included as separate regressors because they constitute major components of the TAXGS category. Treating the aggregate category and its principal components as independent explanatory variables would generate conceptual overlap and could produce multicollinearity and unstable coefficient estimates.

The empirical framework incorporates the first-order lag of the budget balance to capture fiscal persistence and includes inflation as a baseline macroeconomic control. Additional specifications introduce RGDP and a crisis-period dummy to evaluate whether the direction and magnitude of the principal coefficients remain stable after accounting for real economic activity and the exceptional conditions experienced during 2020–2023. The models are estimated using dynamic Ordinary Least Squares with HC3 robust standard errors, which provide a conservative adjustment for potential heteroskedasticity and high-leverage observations in the limited annual sample.

The study interprets the estimated coefficients as conditional dynamic associations rather than causal effects. Higher revenues from taxes on goods and services may be associated with an improved budget balance, but deteriorating fiscal conditions may also induce changes in tax rates, exemptions, enforcement, or tax-administration practices. The econometric analysis therefore focuses on fiscal persistence, coefficient direction, statistical significance, joint explanatory relevance, and stability across alternative specifications.

Accordingly, the main objective of this study is to examine the dynamic relationship between aggregate revenues from taxes on goods and services and Romania's general government budget balance. To achieve this aim, the following specific objectives are formulated:

O1. To analyse the evolution of Romania's general government budget balance, revenues from taxes on goods and services, inflation, and real economic activity during the period 2010–2025.

O2. To estimate the association between revenues from taxes on goods and services and Romania's budget balance after accounting for fiscal persistence and inflation.

O3. To assess the stability of the estimated relationships by introducing real gross domestic product and a crisis-period dummy in alternative specifications.

O4. To formulate policy implications concerning indirect tax collection, fiscal governance, VAT digitalisation, and the institutional and political-economy constraints affecting consumption-tax reforms in Romania.

The study contributes to the literature by providing updated empirical evidence for Romania during a period characterised by substantial economic and institutional change. The dataset encompasses post-financial-crisis fiscal consolidation, the COVID-19 pandemic, the energy crisis, the subsequent inflationary shock, and renewed pressure for fiscal adjustment.

A dynamic perspective is adopted through the inclusion of the lagged budget balance. This approach recognises that current fiscal outcomes are partly associated with the position inherited from the preceding year and enables fiscal persistence to be evaluated explicitly.

The use of TAXGS as a coherent aggregate measure of indirect taxation provides a parsimonious alternative to simultaneously estimating the aggregate category together with VAT and excise duties. This modelling choice addresses the conceptual overlap and multicollinearity that may arise when an aggregate variable is included alongside its principal components.

Coefficient stability is evaluated through RGDP-adjusted and crisis-adjusted specifications. These alternative models show whether the direction and magnitude of the principal relationships remain stable after accounting for real economic activity and the exceptional 2020–2023 period.

The empirical findings are also connected to Romania's institutional context. Particular attention is given to the implementation challenges associated with VAT digitalisation, including system interoperability, administrative capacity, compliance costs, and effective data use. The political-economy constraints affecting excise-duty reforms are also considered. These institutional elements translate the aggregate TAXGS result into appropriately qualified policy implications without attributing separate econometric effects to VAT or excise duties.

The remainder of the paper is organised as follows. Section 2 reviews the literature on fiscal sustainability, indirect taxation, fiscal persistence, and macroeconomic conditions. Section 3 presents the data, variables, dynamic econometric specifications, diagnostic procedures, and research hypotheses. Section 4 reports the descriptive evidence, diagnostic tests, and econometric results. Section 5 discusses the findings and their implications for tax policy and fiscal governance. Section 6 summarises the main conclusions, acknowledges the study's limitations, and outlines directions for future research.

2. LITERATURE REVIEW

Fiscal sustainability has become one of the central concerns of modern public finance literature, particularly following the succession of global economic crises and the increasing fiscal pressures generated by demographic change, climate policies, and macroeconomic uncertainty (Marín-Rodríguez *et al*., 2023; OECD, 2026). Although fiscal sustainability is commonly associated with maintaining government debt and budget deficits at manageable levels over time, the literature emphasizes that sustainable public finances depend fundamentally on the government's capacity to generate stable and predictable revenues while preserving economic growth (Mwakalila, 2026; OECD, 2025). Within this framework, taxation represents one of the principal policy instruments available to governments for restoring fiscal balance.

A substantial body of literature distinguishes between direct and indirect taxation regarding their contribution to fiscal sustainability. Direct taxes, including personal and corporate income taxes, are generally considered more progressive but also more sensitive to fluctuations in economic activity (Auerbach, 2025; De Vito *et al*., 2025). In contrast, indirect taxes are often regarded as more stable sources of public revenue because they rely on consumption, which usually exhibits lower volatility than

income during economic downturns (Fortea, 2025; Raouf, 2026). Consequently, many governments have gradually increased the relative importance of indirect taxation within their fiscal systems, particularly after the global financial crisis (Zabavnik & Verbič, 2025).

Among indirect taxes, Value Added Tax (VAT) has attracted the greatest attention in empirical research. Recent studies (European Commission, 2025; OECD, 2024) argue that Value Added Tax (VAT) remains one of the most efficient revenue-generating instruments because of its broad tax base, relatively stable revenue performance, neutrality across production stages, and the increasing digitalisation of tax administration promoted across European Union Member States. Furthermore, VAT is widely recognised as an important contributor to fiscal stability because its broad consumption base generates relatively predictable government revenues while producing fewer economic distortions than many direct taxes (Cnossen, 2022). Nevertheless, several studies (Baer, Barra, *et al*., 2025; von Schiller, 2024) also underline that the effectiveness of VAT depends heavily on administrative efficiency, tax compliance, digitalisation of tax administration, and the size of the informal economy. Countries characterised by high VAT gaps or weak tax enforcement often fail to transform statutory tax rates into effective fiscal revenues.

Excise duties represent the second major component of indirect taxation discussed in the literature. Unlike VAT, excise taxes pursue both fiscal and regulatory objectives by taxing products such as fuel, alcohol, tobacco, and energy. Previous studies (European Commission, 2022; Primorac *et al*., 2025) indicate that excise revenues generally display greater stability than income taxes because demand for many excisable goods is relatively price inelastic. However, excessive increases in excise taxation may stimulate illicit trade, tax avoidance, or reductions in consumption, thereby limiting long-term fiscal gains. Consequently, the literature suggests that excise policy should balance revenue generation with broader economic, environmental, and public health objectives (Ermuxammadovich, 2024; Manthey *et al*., 2024).

Beyond taxation itself, numerous studies (Afonso *et al*., 2025; Ciaffi *et al*., 2024) argue that fiscal sustainability is influenced by broader macroeconomic conditions. Economic growth expands the tax base, increases employment, and improves government revenues, thereby reducing budget deficits (Dabla-Norris & Lima, 2023; Parui, 2024). Conversely, economic recessions reduce tax collections while increasing public expenditures through automatic stabilisers and discretionary fiscal interventions (Dolls *et al*., 2022; Jalles *et al*., 2024). Inflation also exerts complex effects on public finances. While higher inflation may temporarily increase nominal tax revenues, it simultaneously raises government expenditures and may erode real purchasing power, producing ambiguous effects on fiscal balances (Cochrane, 2022; Mutai *et al*., 2026). Therefore, recent empirical research increasingly analyses taxation within broader macroeconomic frameworks rather than considering fiscal variables in isolation (Angelov & Nikolova, 2025; Isla-Castillo *et al*., 2026).

The empirical evidence regarding the relationship between indirect taxation and fiscal sustainability remains heterogeneous. Several cross-country studies (Buthelezi, 2025; Marattin *et al*., 2022) report that greater reliance on indirect taxation contributes positively to fiscal consolidation by increasing the stability of government revenues. Other authors (Ebaidalla, 2024; Ndiaye *et al*., 2026; Sojoodi & Alamdari, 2026) argue that the fiscal effects of indirect taxation depend on institutional quality, tax administration efficiency, governance, and the composition of public expenditures. In emerging economies, improvements in tax collection frequently produce larger fiscal effects than increases in statutory tax rates, suggesting that administrative reforms may be more effective than tax policy changes alone.

Romania represents a particularly interesting case within this debate. Since joining the European Union, the country has progressively harmonised its indirect taxation system with European legislation while simultaneously facing persistent fiscal imbalances (European Commission, 2026a; World Bank, 2023). During the analysed period, Romanian public finances were affected by several structural shocks, including the aftermath of the global financial crisis, the COVID-19 pandemic, the energy crisis, and the recent inflationary episode. These developments have increased the importance of maintaining stable revenue sources capable of financing expanding public expenditures without compromising fiscal sustainability. Recent reports published by the European Commission, OECD, and IMF consistently identify improvements in VAT compliance, digital tax administration, and expenditure efficiency as key priorities for Romania's fiscal consolidation strategy (European Commission, 2026b; Eyraud *et al*., 2026).

Despite the extensive literature on taxation and fiscal sustainability, important research limitations remain. First, many studies (Mihai *et al*., 2025; Seghini, 2026) investigate fiscal sustainability primarily from the

perspective of public debt dynamics or aggregate fiscal balances, without explicitly evaluating the individual contribution of the principal components of indirect taxation. Second, existing empirical research (Dragos *et al*., 2025; Mascagni *et al*., 2023) often analyses VAT or excise duties separately, providing limited evidence regarding their simultaneous contribution within an integrated fiscal framework. Third, although macroeconomic variables such as economic growth and inflation are recognised as important determinants of fiscal outcomes, relatively few studies estimate their combined effects alongside multiple indirect tax indicators (Balasoiu *et al*., 2023; Đurović Todorović *et al*., 2024). Finally, most empirical evidence for Romania either predates the COVID-19 pandemic or does not fully incorporate the recent institutional reforms associated with the revised European fiscal governance framework and the implementation of fiscal consolidation measures after 2021 (European Union, 2024; Eyraud *et al*., 2026).

Accordingly, this study addresses these limitations by developing an integrated empirical framework that simultaneously evaluates the effects of Taxes on Goods and Services, Value Added Tax, Excise Duties, Real Gross Domestic Product, and Inflation on Romania's budget deficit during the period 2010–2025. By jointly considering fiscal and macroeconomic determinants, the analysis provides updated evidence on the mechanisms through which indirect taxation contributes to fiscal sustainability under recent economic and institutional conditions. This integrated perspective extends previous studies that have generally examined these determinants independently and provides evidence-based insights relevant for contemporary fiscal policymaking.

Although the relationship between taxation and fiscal sustainability has been widely investigated, several important research gaps remain. Existing studies predominantly focus either on overall fiscal sustainability, public debt dynamics, or individual tax instruments, while comparatively little attention has been devoted to simultaneously analysing the principal components of indirect taxation within a unified empirical framework. Moreover, evidence for Romania remains limited, particularly regarding the combined effects of Taxes on Goods and Services, Value Added Tax, Excise Duties, Real Gross Domestic Product, and Inflation during the post-pandemic period characterised by fiscal consolidation, high inflation, and the implementation of the revised European fiscal governance framework. By integrating these fiscal and macroeconomic determinants into a single econometric model covering the period 2010–2025, the present study contributes updated empirical evidence that improves understanding of the role of indirect taxation in supporting fiscal sustainability and provides policy-relevant insights for the design of more effective revenue mobilisation strategies.

3. RESEARCH METHODOLOGY

3.1. Research Design and Data

This study examines the dynamic relationship between indirect taxation and Romania's general government budget balance over the period 2010–2025. The empirical analysis investigates whether revenues from taxes on goods and services are associated with changes in the fiscal balance after accounting for fiscal persistence, inflation, real economic activity, and the exceptional macroeconomic conditions experienced during the COVID-19 pandemic and energy crisis.

Romania provides a relevant empirical setting because its public finances were characterised during the analysed period by persistent budget deficits, recurrent fiscal adjustments, tax-administration reforms, and several major economic shocks. The selected period covers post-financial-crisis fiscal consolidation, the COVID-19 pandemic, the subsequent economic recovery, energy-market disruptions, the inflationary surge after 2021, and renewed fiscal-consolidation measures.

The analysis uses annual data for 2010–2025. The initial dataset contains 16 observations. Because the dynamic specification includes the first lag of the dependent variable, the effective estimation sample is reduced to 15 observations.

The limited sample requires a parsimonious econometric specification. Consequently, the analysis focuses on a restricted set of theoretically relevant variables and compares the preferred model with two augmented specifications. The estimated coefficients are interpreted as conditional dynamic associations rather than causal effects.

3.2. Selection of the Dependent Variable

The general government budget balance (DEF) is employed as the dependent variable because it directly captures the annual difference between government revenues and expenditures. As a flow indicator, the budget balance responds contemporaneously to changes in tax revenues and expenditure and is therefore closely aligned with the objective of examining the relationship between indirect taxation and Romania's fiscal position.

DEF is expressed as a percentage of GDP and takes negative values during deficit years. An increase in DEF therefore represents a movement towards a less negative balance and an improvement in the fiscal position, whereas a decrease in DEF denotes a larger fiscal deficit.

3.3. Explanatory Variables

The revised econometric framework includes the first lag of the budget balance, aggregate revenues from taxes on goods and services, inflation, real gross domestic product, and a crisis-period dummy.

The empirical analysis covers the period 2010–2025, a time horizon considered sufficiently representative for capturing both structural and cyclical developments affecting Romanian public finances. The selected interval begins after the stabilization measures adopted in response to the global financial crisis and encompasses several major economic events that significantly influenced fiscal performance, including Romania's fiscal convergence within the European Union, the COVID-19 pandemic, the subsequent economic recovery supported by the Next Generation EU programme, the energy market disruptions associated with geopolitical tensions, the inflationary surge observed after 2021, and the fiscal consolidation measures introduced to reduce the budget deficit. The indicators used are presented in Table **1**.

The dependent variable is the budget deficit (DEF), expressed as a percentage of GDP. It is widely used as an indicator of fiscal sustainability because it reflects the balance between government revenues and expenditures and represents a key fiscal criterion within the European Union (Mihai *et al*., 2025; Ndiaye *et al*., 2026).

The lagged budget balance, DEF_{t-1}, is included to capture fiscal persistence. Fiscal outcomes may extend across successive years because tax structures, expenditure commitments, fiscal rules, and consolidation measures adjust gradually. A positive lag coefficient indicates that the fiscal position recorded in the preceding year is partially transmitted to the current year.

Real Gross Domestic Product (RGDP) is included to capture the level of economic activity. Higher economic growth expands the tax base and generally improves government revenues, contributing to lower budget deficits (Badiu (Cazacu) *et al*., 2024; Long *et al*., 2025).

The inflation rate (INFL) is incorporated to account for macroeconomic conditions affecting public finances. Inflation may increase nominal indirect tax revenues while simultaneously raising public expenditures and reducing purchasing power, resulting in an ambiguous overall effect on fiscal balances (European Central Bank, 2023; Mutai *et al*., 2026).

Taxes on Goods and Services (TAXGS) represent the aggregate level of indirect taxation. This variable reflects

Table 1: Definition of variables used in the econometric model

Variable	Symbol	Unit of Measurement	Definition	Supporting Literature
Budget Deficit	DEF	% of GDP	Annual difference between general government revenues and expenditures. More negative values indicate larger fiscal deficits.	Afonso *et al*. (Afonso *et al*., 2025) Levy Yeyati & Sturzenegger (Levy Yeyati & Sturzenegger, 2023)
Lagged budget balance	DEFt−1	% of GDP	Budget balance recorded in the preceding year, included to capture fiscal persistence.	Afonso *et al*. (Afonso *et al*., 2025) Levy Yeyati & Sturzenegger (Levy Yeyati & Sturzenegger, 2023)
Real Gross Domestic Product	RGDP	Annual growth rate (%)	Measures the level of real economic activity and the expansion of the tax base. Higher economic growth generally improves public revenues.	Balasoiu *et al*. (Balasoiu *et al*., 2023), Cornevin *et al*. (Cornevin *et al*., 2024)
Inflation Rate	INFL	%	Annual percentage change in the Consumer Price Index (CPI). Inflation influences both nominal tax revenues and public expenditures.	Martin (Martin, 2025), Tax Foundation Europe (Tax Foundation Europe, 2024b)
Taxes on Goods and Services	TAXGS	% of GDP	Total revenues from taxes on goods and services, representing the overall level of indirect taxation.	Abd Hakim *et al*. (Abd Hakim *et al*., 2022), OECD (OECD, 2024)
Crisis period	CRISIS	Binary variable: 0/1	Takes the value one for 2020–2023 and zero otherwise, capturing the combined exceptional period associated with the COVID-19 pandemic, energy-market disruption, and the subsequent inflationary shock.	

Source: Prepared by the authors.

the overall contribution of consumption taxes to public revenues and is commonly associated with greater revenue stability and fiscal resilience (Jemiluyi & Jeke, 2023; Okoth *et al*., 2025).

CRISIS accounts for the exceptional fiscal and macroeconomic conditions experienced during 2020–2023. This interval includes the COVID-19 pandemic, the energy crisis, and the associated inflationary shock. Because these events affected government revenues and expenditure simultaneously, CRISIS is employed as a robustness control rather than as an indicator of the separate causal effect of each shock.

The empirical relationship between indirect taxation and Romania's budget balance is examined using a dynamic Ordinary Least Squares framework. The inclusion of the first-order lag of the budget balance accounts for the persistence of fiscal outcomes across successive years. This structure makes it possible to estimate the association between taxes on goods and services and the current fiscal balance while controlling for the budgetary position inherited from the preceding year.

The baseline dynamic model is specified as follows:

$$DEF_t = \alpha + \rho DEF_{t-1} + \beta_1 TAXGS_t + \beta_2 INFL_t + \varepsilon_t \quad (1)$$

where DEF_t denotes the general government budget balance in year t, DEF_{t-1} represents its first-order lag, $TAXGS_t$ denotes revenues from taxes on goods and services, $INFL_t$ represents the annual inflation rate, α is the intercept, ρ, β_1 and β_2 are the parameters to be estimated, and ε_t is the stochastic disturbance term.

The coefficient ρ measures the persistence of the fiscal balance. A positive coefficient indicates that the fiscal position recorded in the preceding year is partially transmitted to the current year. A coefficient between zero and one is consistent with a persistent but convergent fiscal process, in which fiscal shocks affect subsequent periods but gradually diminish over time.

The coefficient β_1 captures the conditional association between revenues from taxes on goods and services and the budget balance. Because DEF is expressed as a signed balance, with more negative values indicating larger deficits, a positive coefficient for TAXGS indicates that higher indirect tax revenues are associated with a less negative budget balance and therefore with an improvement in the fiscal position.

The coefficient β_2 captures the relationship between inflation and the budget balance. Its expected direction is theoretically ambiguous. Inflation may increase nominal tax receipts by raising the nominal value of taxable transactions, but it may also increase public expenditure through higher public-sector wages, social transfers, procurement costs, and interest expenditure.

To assess whether the estimated relationships are sensitive to real economic activity, a second specification includes real gross domestic product:

$$DEF_t = \alpha + \rho DEF_{t-1} + \beta_1 TAXGS_t + \beta_2 INFL_t + \beta_3 RGDP_t + \varepsilon_t \quad (2)$$

A third specification incorporates a crisis-period dummy to account for the exceptional fiscal and macroeconomic conditions experienced during 2020–2023:

$$DEF_t = \alpha + \rho DEF_{t-1} + \beta_1 TAXGS_t + \beta_2 INFL_t + \beta_3 RGDP_t + \gamma CRISIS_t + \varepsilon_t \quad (3)$$

where $CRISIS_t$ takes the value one for the years 2020–2023 and zero otherwise. The coefficient γ captures the conditional average difference in the budget balance during the period associated with the COVID-19 pandemic, energy-market disruptions, and the subsequent inflationary shock, after controlling for fiscal persistence, indirect taxation, inflation, and real economic activity.

The crisis-adjusted specification is used as a robustness test because the events covered by the dummy affected government revenues, emergency expenditure, energy-support measures, subsidies, and other fiscal interventions simultaneously. Consequently, the CRISIS coefficient is interpreted as a conditional association with the combined crisis period rather than as the separate causal effect of the pandemic, energy crisis, or inflationary shock.

The three specifications are estimated using Ordinary Least Squares with HC3 heteroskedasticity-consistent standard errors. Model comparison is based on coefficient signs and magnitudes, statistical precision, the overall robust F-test, the coefficient of determination, the adjusted coefficient of determination, and model parsimony. The baseline model provides the principal estimates, while the RGDP-augmented and crisis-adjusted specifications are used to evaluate the stability of the results under alternative sets of controls.

Based on the theoretical framework and previous empirical evidence concerning fiscal persistence, indirect taxation, and macroeconomic conditions, this study formulates three hypotheses to examine the dynamic relationship between revenues from taxes on goods and services and Romania's general government budget balance.

H1. Romania's general government budget balance exhibits significant temporal persistence.

H2. Higher revenues from taxes on goods and services are positively and significantly associated with Romania's general government budget balance.

H3. Fiscal persistence, taxes on goods and services, and inflation jointly provide a statistically significant explanation of Romania's general government budget balance.

The proposed methodological approach enables a comprehensive assessment of the relationship between indirect taxation, macroeconomic conditions, and fiscal sustainability, providing empirical evidence to support fiscal policy decisions in Romania.

4. RESULTS

Romania's fiscal performance during 2010–2025 was shaped by a series of economic and institutional developments, including post-crisis fiscal consolidation, changes in the European Union's fiscal governance framework, the COVID-19 pandemic, the energy crisis, and the subsequent inflationary pressures. Within this context, taxes on goods and services represented an important source of public revenue, while the budget balance exhibited substantial variation across the analysed period. The following empirical analysis examines the dynamic association between revenues from taxes on goods and services and Romania's general government budget balance, while accounting for fiscal persistence, inflation, real economic activity, and the exceptional crisis period. Table **2** reports the descriptive statistics for the variables included in the econometric analysis. These statistics provide an overview of the distribution, variability, and central tendency of the general government budget balance, real gross domestic product, inflation, and revenues from taxes on goods and services during 2010–2025.

The general government budget balance (DEF) averaged −4.96% of GDP, with values ranging from −9.30% to −0.50%. Because DEF is expressed as a signed fiscal balance, more negative values indicate larger budget deficits, whereas values closer to zero indicate an improvement in the fiscal position. The relatively large standard deviation of 2.83 percentage points reflects substantial variation in Romania's fiscal performance over the analysed period. The skewness coefficient of −0.04 indicates an approximately symmetric distribution, while the negative kurtosis value suggests a relatively flat distribution compared with the normal distribution.

Revenues from taxes on goods and services (TAXGS) ranged between 9.60% and 13.00% of GDP, with an average of 11.15% and a standard deviation of 1.12 percentage points. The comparatively limited dispersion indicates that TAXGS represented a relatively stable source of public revenue during 2010–2025. Its moderate positive skewness of 0.42 suggests that observations above the sample mean were somewhat more dispersed than those below it, while the negative kurtosis indicates a relatively flat distribution.

Inflation (INFL) exhibited substantial volatility. It ranged from −1.55% to 13.80%, with an average annual rate of 4.54% and a standard deviation of 3.87 percentage points. The positive skewness coefficient of 0.75 reflects the presence of several relatively high-inflation observations, particularly during the energy-price shock and the inflationary period following 2021. The positive kurtosis coefficient indicates a somewhat greater concentration of observations around the centre and in the tails than for a normal distribution.

RGDP ranged from 170.30 to 427.94, with a mean of 249.28 and a standard deviation of 79.13. It displayed the

Table 2*:* **Descriptive Statistics**

Indicators	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
RGDP	170.30	427.94	249.28	79.13	1.09	0.28
DEF	-9.30	-0.50	-4.96	2.83	-0.04	-1.27
INFL	-1.55	13.80	4.54	3.87	0.75	1.13
TAXGS	9.60	13.00	11.15	1.12	0.42	-1.19

Source: Prepared by the authors using SPSS software.

greatest absolute variation among the analysed indicators, reflecting substantial changes in the level of economic activity over the sample period. The positive skewness coefficient of 1.09 indicates a right-skewed distribution, with several relatively high observations in the latter part of the analysed period. RGDP is used as a macroeconomic control in the sensitivity specifications rather than as a component of the preferred dynamic model.

The descriptive evidence indicates considerable variation in the budget balance and inflation, while revenues from taxes on goods and services remained comparatively stable. These patterns provide the descriptive foundation for examining whether TAXGS is dynamically associated with Romania's budget balance after accounting for the persistence of fiscal outcomes and changing macroeconomic conditions.

Figure **1** illustrates the evolution of Romania's general government budget balance, revenues from taxes on goods and services, and inflation during 2010–2025. The three indicators follow distinct trajectories, reflecting differences in their fiscal and macroeconomic dynamics.

The budget balance remained negative throughout the analysed period, indicating the persistence of fiscal deficits. Although the fiscal position improved in certain years, the balance deteriorated markedly during periods of economic disruption. The widening of the deficit during the COVID-19 pandemic reflects the combined effects of emergency public expenditure, fiscal-support measures, and weaker economic activity. The persistence of negative balances after the pandemic further indicates that fiscal adjustment occurred gradually rather than immediately.

Revenues from taxes on goods and services followed a comparatively stable trajectory, fluctuating within a substantially narrower range than the budget balance and inflation. This relative stability supports their role as a recurrent source of government revenue. Nevertheless, the graphical evolution does not indicate that changes in TAXGS were automatically translated into proportional changes in the fiscal balance, as budgetary outcomes were also influenced by expenditure developments, economic conditions, and exceptional policy interventions.

Inflation displayed considerable volatility, with the highest values concentrated in the period associated with energy-market disruptions and the subsequent inflationary shock. Higher inflation may have increased nominal revenues from taxes on goods and services, but it also raised government expenditure and the cost of fiscal-support measures. Its net relationship with the budget balance is therefore not unambiguous from the graphical evidence alone.

The figure indicates persistent fiscal imbalances, comparatively stable revenues from taxes on goods and services, and pronounced inflationary volatility. These descriptive patterns provide the context for the dynamic regression analysis but should not be interpreted as evidence of causal relationships.

Table **3** reports the pairwise correlations among the variables included in the preferred dynamic specification.

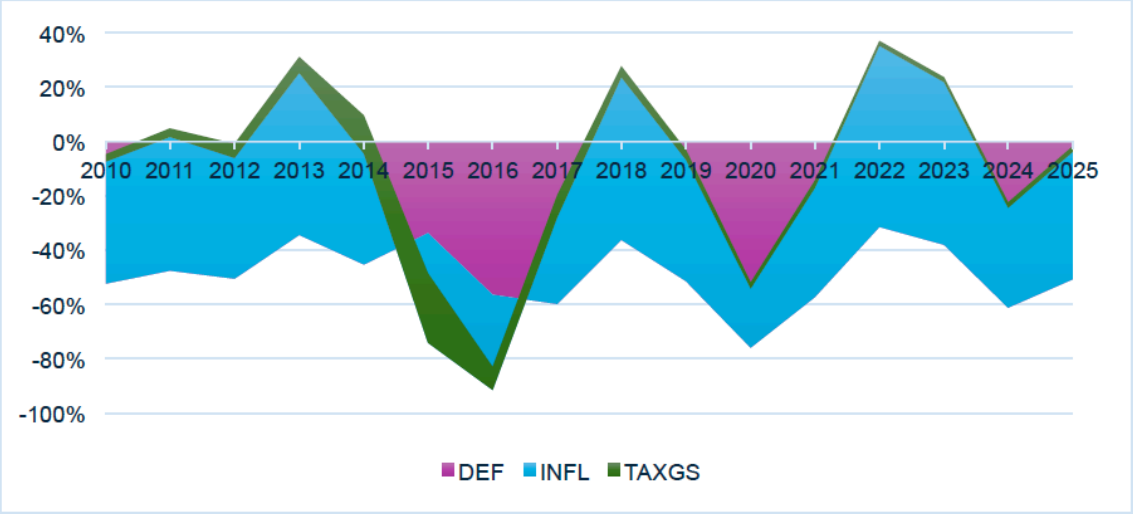

Figure 1: Evolution of the Budget Balance, Taxes on Goods and Services, and Inflation in Romania, 2010–2025.
Source: Prepared by the authors.

Table 3: Matrix of Correlations

Variables	(1)	(2)	(3)	(4)
(1) DEF	1.000			
(2) L.DEF	0.762	1.000		
(3) TAXGS	0.665	0.367	1.000	
(4) INFL	-0.573	-0.724	-0.444	1.000

Source: Created by the authors using Stata.

The current budget balance is strongly and positively correlated with its first-order lag ((r=0.762)). This result provides preliminary evidence of fiscal persistence, suggesting that the fiscal position recorded in one year is closely related to the position observed in the following year. TAXGS is positively correlated with the current budget balance (r=0.665). Since DEF is expressed as a signed balance, this positive correlation suggests that higher revenues from taxes on goods and services tend to be associated with a less negative fiscal balance. This descriptive relationship is consistent with the expected role of indirect tax revenues in supporting the government's fiscal position. The correlation between TAXGS and the lagged budget balance is positive but weaker (r=0.367), indicating that contemporaneous taxes on goods and services are more closely related to the current fiscal position than to the balance inherited from the preceding year. Inflation is negatively correlated with the current budget balance (r=-0.573) and exhibits a stronger negative correlation with the lagged budget balance (r=-0.724). These coefficients suggest that higher inflation tended to coincide with weaker fiscal positions during the analysed period. This pattern may reflect the adverse effects of inflation on public expenditure, social transfers, procurement costs, and fiscal-support measures. Nevertheless, pairwise correlations do not control for the other variables and should not be interpreted as causal effects. The correlation between inflation and TAXGS is moderately negative (r=-0.444). Although inflation can increase nominal tax receipts, its relationship with TAXGS expressed as a share of GDP may differ from its relationship with tax revenues measured in nominal terms. None of the correlations among the explanatory variables exceeds the conventional threshold of 0.80. The correlation matrix therefore provides no immediate indication of severe multicollinearity. This conclusion is further assessed through variance inflation factors.

Table **4** presents the variance inflation factors and tolerance statistics for the variables included in the preferred dynamic specification.

Table 4: Multicollinearity Diagnostics

Variable	VIF	(1/VIF)
INFL	2.27	0.4397
L.DEF	2.11	0.4738
TAXGS	1.25	0.7985
Mean VIF	1.88	

Source: Created by the authors using Stata.

The individual VIF values range from 1.25 for TAXGS to 2.27 for inflation, while the mean VIF is 1.88. All values are substantially below the commonly applied threshold of 5. The tolerance statistics range from 0.4397 to 0.7985 and therefore remain above the critical value of 0.20.

These results indicate that the preferred dynamic specification does not present problematic multicollinearity. In particular, the use of TAXGS as the aggregate indicator of indirect taxation avoids the conceptual and statistical overlap that would arise from simultaneously including TAXGS together with VAT and excise duties. Consequently, the coefficient estimates are not affected by severe linear dependence among the explanatory variables.

Table **5** reports the diagnostic tests applied to the preferred dynamic specification.

Table 5: Model Diagnostic Tests

Diagnostic test	Statistic	p-value
Breusch–Pagan/Cook–Weisberg	chi2(1)=1.50	0.2214
White heteroskedasticity test	chi2(9)=10.93	0.2804
Breusch–Godfrey LM(1)	chi2(1)=5.053	0.0246
Ramsey RESET	F(3,8)=4.55	0.0384
Shapiro–Wilk	W=0.918	0.1834
Skewness–kurtosis	chi2(2)=2.48	0.2891

Source: Created by the authors using Stata.

The Breusch–Pagan/Cook–Weisberg test does not reject the null hypothesis of constant residual variance

(p=0.2214). The White test leads to the same conclusion (p=0.2804). Thus, neither test provides evidence of heteroskedasticity. Nevertheless, HC3 standard errors are retained because of the small sample and the possible influence of high-leverage observations.

The Shapiro–Wilk test (p=0.1834) and the joint skewness–kurtosis test (p=0.2891) do not reject the null hypothesis of normally distributed residuals. The residual distribution is therefore broadly consistent with the normality assumption.

However, the Breusch–Godfrey LM test rejects the null hypothesis of no first-order serial correlation (p=0.0246). This result indicates that residual dependence remains present even after including the first lag of the budget balance. Because HC3 adjusts the standard errors for potential heteroskedasticity and leverage but not for serial correlation, the coefficient inference must be interpreted cautiously and complemented by autocorrelation-consistent estimation.

The Ramsey RESET test also rejects the null hypothesis of correct functional specification (p=0.0384). This result suggests that the linear model may not fully capture the underlying fiscal relationship or that relevant dynamic, nonlinear, or omitted influences remain. The RESET result does not identify the specific source of misspecification, but it limits the strength of the conclusions that can be drawn from the estimated coefficients.

The preferred model satisfies the multicollinearity, homoskedasticity, and residual-normality diagnostics. The evidence of residual serial correlation and possible functional-form misspecification means that the results should be interpreted as exploratory dynamic associations rather than definitive causal estimates.

Table **6** reports the results of three dynamic OLS specifications estimated with HC3 robust standard errors. Model (1) represents the preferred parsimonious specification and includes the lagged budget balance, taxes on goods and services, and inflation. Model (2) adds RGDP as a control for real economic activity, while Model (3) additionally introduces the CRISIS dummy for 2020–2023.

ll three specifications are statistically significant overall. The robust F-statistic is 11.85 in Model (1), with (p=0.001), 6.55 in Model (2), with (p=0.007), and 5.96 in Model (3), with (p=0.011). These results indicate that the

Table 6: Dynamic OLS Models with HC3 Standard Errors

	(1)	(2)	(3)
	OLS Model	**With RGDP**	**Crisis-adjusted**
L.DEF	0.698**	0.662	0.570
	(0.279)	(0.393)	(0.516)
TAXGS	40.696**	36.582	23.143
	(17.718)	(41.156)	(31.445)
INFL	0.096	0.100	0.166
	(0.175)	(0.210)	(0.323)
RGDP		-0.003	-0.009
		(0.022)	(0.020)
CRISIS			-1.379
			(2.374)
_cons	-16.019**	-14.000	-8.173
	(6.766)	(18.688)	(14.441)
Observations	15	15	15
R-squared	0.760	0.762	0.785
Adjusted R-squared	0.695	0.667	0.666
F-statistic	11.85	6.55	5.96
Prob. > F	0.001	0.007	0.011

Standard errors in parentheses.

variables included in each specification are jointly associated with Romania's general government budget balance.

Model (1) explains 76.0% of the variation in the budget balance, while its adjusted (R^2) is 0.695. Adding RGDP in Model (2) increases (R2) only marginally, from 0.760 to 0.762, but reduces the adjusted (R^2) from 0.695 to 0.667. Model (3) produces the highest unadjusted (R^2), equal to 0.785, but its adjusted (R^2) declines further to 0.666. Because (R^2) generally increases when additional regressors are introduced, the adjusted measure provides a more appropriate comparison. On this basis, the more parsimonious Model (1) provides the strongest adjusted explanatory performance and is retained as the preferred specification.

The coefficient of the lagged budget balance is positive in all three specifications. In Model (1), the coefficient is 0.698 and statistically significant at the 5% level. This finding indicates substantial fiscal persistence: holding TAXGS and inflation constant, a one-percentage-point improvement in the preceding year's budget balance is associated with an approximately 0.698-percentage-point improvement in the current balance.

The coefficient is positive but smaller in the augmented models, decreasing to 0.662 after RGDP is introduced and to 0.570 after controlling for the crisis period. Although these coefficients are no longer individually significant, their consistently positive signs indicate that the direction of fiscal persistence is stable across the three specifications. The loss of statistical significance is accompanied by larger HC3 standard errors and should be interpreted in the context of the very small effective sample and the additional parameters included in Models (2) and (3).

The result obtained in Model (1) is consistent with the fiscal persistence documented by Chifu and Păun (Chifu & Păun, 2026), who found that a substantial proportion of Romania's fiscal imbalance is carried forward from one period to the next. More generally, the finding supports the view that budgetary adjustment is gradual because expenditure commitments, tax structures, fiscal rules, and consolidation measures cannot be changed immediately. Persistent fiscal imbalances may consequently continue even after the initial economic shock has diminished.

Accordingly, H1, which states that Romania's general government budget balance exhibits statistically significant temporal persistence, is supported by the preferred model. However, the augmented specifications show that the statistical strength of this relationship is sensitive to the inclusion of additional controls.

TAXGS has a positive coefficient in all three specifications. It is equal to 40.696 and statistically significant at the 5% level in Model (1). Because DEF is expressed as a signed balance, with more negative values indicating larger deficits, the positive coefficient means that higher revenues from taxes on goods and services are associated with a less negative budget balance and therefore with an improvement in Romania's fiscal position.

If TAXGS is entered in the regression as a decimal share of GDP, a one-percentage-point increase corresponds to a change of 0.01.

Thus, a one-percentage-point increase in TAXGS is associated with an approximately 0.407-percentage-point improvement in the budget balance, holding fiscal persistence and inflation constant. This interpretation should be retained only if TAXGS was estimated in decimal form.

The TAXGS coefficient remains positive after the addition of RGDP and CRISIS, but its magnitude decreases from 40.696 in Model (1) to 36.582 in Model (2) and 23.143 in Model (3). The sign stability indicates that the positive relationship is not reversed by the additional controls. Nevertheless, the coefficients are no longer statistically significant in the augmented models, and their standard errors are relatively large. The evidence therefore supports a positive association in the preferred specification, but it does not demonstrate that the individual TAXGS effect is statistically robust across every model.

The positive TAXGS coefficient is consistent with studies emphasising the revenue-generating role of consumption-based taxation. Fortea (2025) (Fortea, 2025) found that consumption taxes represent an important component of public revenue mobilisation, while Abd Hakim *et al*. (Abd Hakim *et al*., 2022) highlighted the relevance of indirect taxation for fiscal and economic performance. OECD (OECD, 2024) similarly emphasised the broad revenue base and relative stability of consumption taxes. The present result extends this reasoning to Romania by showing that aggregate taxes on goods and services are positively associated with the signed budget balance.

The finding should not, however, be interpreted as evidence that statutory tax-rate increases automatically improve fiscal sustainability. The fiscal contribution of

TAXGS also depends on the tax base, compliance, collection efficiency, exemptions, informal economic activity, and the capacity of the tax administration. Moreover, the OLS estimates identify conditional associations rather than causal effects.

H2, which states that higher revenues from taxes on goods and services are positively and significantly associated with Romania's budget balance, is supported by Model (1). The positive sign remains stable in Models (2) and (3), although the loss of individual significance indicates that H2 receives conditional rather than uniformly robust support across the alternative specifications.

The inflation coefficient is positive in all three models but is not statistically significant. It increases slightly from 0.096 in Model (1) to 0.100 in Model (2) and 0.166 in Model (3). The positive sign may reflect the short-run buoyancy of nominal tax receipts, including taxes applied to the nominal value of consumption. However, the lack of statistical significance means that the analysis does not identify an independent inflation effect after accounting for fiscal persistence and the other controls.

This result is economically plausible because inflation affects the budget balance through opposing mechanisms. Higher prices may increase nominal VAT and other consumption-tax revenues, but they may also raise public-sector wages, social benefits, procurement expenditure, subsidies, and debt-servicing costs. The European Central Bank (European Central Bank, 2023) emphasised this complex interaction between inflation and fiscal outcomes, while Tax Foundation Europe (Tax Foundation Europe, 2024a)showed that the revenue effects of inflation depend on the structure and design of national tax systems.

The results therefore suggest that inflation operated as a relevant macroeconomic context rather than as a statistically identifiable independent determinant of Romania's budget balance in the present sample.

RGDP is introduced in Models (2) and (3). Its coefficient is negative in both specifications, at −0.003 and −0.009, respectively, but is not statistically significant. The magnitude is close to zero, while the associated standard errors indicate that the estimated relationship is imprecise.

The absence of an individually significant RGDP coefficient suggests that, after controlling for fiscal persistence, TAXGS, and inflation, real economic activity does not provide a detectable incremental contribution within the limited annual sample. Economic growth may expand the tax base, but its fiscal benefits can be offset by simultaneous increases in government expenditure or by the composition of economic activity and tax collection.

This result differs from Chifu and Păun (Chifu & Păun, 2026), who identified economic growth as an important determinant of Romania's fiscal balance using a longer quarterly series and a different dynamic framework. The contrast may reflect differences in data frequency, sample size, variable measurement, lag structure, and econometric specification. It does not establish that economic activity is irrelevant to fiscal performance; rather, its independent contribution cannot be identified precisely in the present annual sample.

The CRISIS coefficient in Model (3) is −1.379. Because higher DEF values indicate an improved fiscal balance, the negative coefficient suggests that Romania's budget balance was, on average, approximately 1.379 percentage points weaker during 2020–2023, after controlling for fiscal persistence, TAXGS, inflation, and RGDP.

The sign is consistent with the exceptional fiscal pressures generated by the COVID-19 pandemic, energy-support interventions, subsidies, and other measures adopted to protect households and firms. The coefficient is not statistically significant and has a relatively large HC3 standard error of 2.374. The confidence interval would therefore include zero, preventing a definitive conclusion regarding an independent crisis-period effect.

The lack of statistical significance may reflect the limited sample and the difficulty of separating the crisis effect from contemporaneous changes in inflation, economic activity, tax revenues, and the lagged fiscal balance. The CRISIS dummy also combines several overlapping shocks and cannot distinguish the pandemic from the energy crisis or the inflationary episode.

Its negative sign is consistent with the descriptive evidence and with institutional assessments reporting a deterioration of Romania's fiscal position during the recent crisis period. The crisis-adjusted model therefore provides directional, but not statistically conclusive, evidence of a weaker budget balance during 2020–2023.

Despite the lack of individual significance for inflation, RGDP, and CRISIS, all three models are jointly significant. In particular, the preferred specification has a robust F-statistic of 11.85 and a p-value of 0.001. This indicates that fiscal persistence, taxes on goods and services, and inflation jointly provide a statistically

significant explanation of the budget balance. H3, which states that the variables included in the preferred dynamic model jointly provide a statistically significant explanation of Romania's budget balance, is therefore supported. This conclusion concerns the collective explanatory relevance of the model and does not imply that every coefficient is individually significant.

5. DISCUSSION AND POLICY IMPLICATIONS

The empirical results indicate that fiscal persistence and aggregate revenues from taxes on goods and services are relevant to the evolution of Romania's general government budget balance. The preferred dynamic model is statistically significant overall and explains a substantial proportion of the variation in the fiscal balance. Nevertheless, the results should be interpreted as conditional dynamic associations rather than causal effects, particularly given the limited annual sample and the sensitivity of individual coefficient significance to the inclusion of additional controls.

The positive and statistically significant coefficient of the lagged budget balance indicates substantial fiscal persistence. Romania's current fiscal position is strongly associated with the balance recorded in the preceding year, suggesting that fiscal imbalances adjust gradually. This finding is consistent with the multiannual character of public expenditure commitments, tax structures, fiscal rules, and consolidation measures. It also corresponds with the evidence reported by Chifu and Păun (Chifu & Păun, 2026), who identified substantial persistence in Romania's fiscal position. From a policy perspective, the result implies that temporary fiscal shocks can have consequences extending beyond the year in which they occur and that delayed consolidation may allow budgetary imbalances to become embedded in subsequent fiscal periods.

TAXGS has a positive and statistically significant coefficient in the preferred model. Because DEF is expressed as a signed budget balance, with more negative values indicating larger deficits, the positive coefficient shows that higher revenues from taxes on goods and services are associated with a less negative balance and therefore with an improvement in the fiscal position. This result is consistent with previous studies emphasising the revenue-generating role and relative stability of consumption-based taxation (Abd Hakim *et al*., 2022; Fortea, 2025; OECD, 2024).

However, the estimated TAXGS coefficient decreases in magnitude and loses individual statistical significance after RGDP and the crisis dummy are introduced. Its sign remains positive in all specifications, but its statistical precision is not uniform. Consequently, the results support a positive association between aggregate indirect taxation and the budget balance in the preferred model, but they do not demonstrate that increases in taxes on goods and services automatically or causally improve fiscal sustainability.

The fiscal contribution of TAXGS depends not only on tax rates but also on the effective tax base, compliance, exemptions, collection efficiency, informal economic activity, and expenditure developments. Additional revenues may not generate a durable improvement in the fiscal balance if they are accompanied by higher public expenditure, weak fiscal discipline, or inefficient allocation of public resources. This interpretation is consistent with the view that fiscal sustainability depends on both revenue mobilisation and the quality of fiscal governance (Baer, Barra, *et al*., 2025; Pavlopoulos *et al*., 2026).

Inflation has a positive but statistically insignificant coefficient across the three specifications. The lack of an individually significant effect reflects the competing fiscal channels through which inflation operates. Higher prices can increase nominal receipts from taxes applied to consumption, but they can also increase public-sector wages, social transfers, procurement expenditure, subsidies, and debt-servicing costs. The net effect on the budget balance may therefore depend on the relative speed with which revenues and expenditures adjust to inflation (European Central Bank, 2023).

RGDP is also statistically insignificant in the augmented specifications and provides only a marginal increase in the unadjusted explanatory power of the model. Although stronger economic activity can expand the tax base, its fiscal benefits may be offset by simultaneous increases in public expenditure or by the structure of economic activity and tax collection. The absence of a significant RGDP coefficient in the present analysis may also reflect the limited annual sample and the inclusion of fiscal persistence.

The CRISIS coefficient is negative, suggesting a weaker budget balance during 2020–2023 after controlling for the remaining variables. Its direction is consistent with the extraordinary fiscal pressures generated by the COVID-19 pandemic, energy-support interventions, subsidies, and other measures adopted to protect households and firms. Nevertheless, the coefficient is not statistically significant. The analysis therefore provides directional but not statistically conclusive evidence of an independent

crisis-period effect. The crisis dummy should be interpreted as a sensitivity control covering several overlapping shocks rather than as a measure of the separate causal effect of the pandemic or energy crisis.

The econometric analysis employs TAXGS as the aggregate measure of indirect taxation. VAT and excise duties are not estimated as separate variables because they are major components of the TAXGS category. Their simultaneous inclusion would create conceptual overlap and could generate multicollinearity. Consequently, the study does not estimate separate VAT or excise-duty coefficients.

Nevertheless, VAT administration and excise-duty policy remain relevant to interpreting the institutional mechanisms through which aggregate TAXGS revenues can be mobilised. The following recommendations are therefore derived from the aggregate TAXGS result and Romania's institutional context, not from separately estimated effects of VAT or excise duties.

The positive association between TAXGS and the budget balance suggests that improving the effective collection of consumption taxes can support Romania's fiscal position. The preferred policy response should not consist primarily of increasing statutory tax rates. Greater emphasis should be placed on broadening the effective tax base, reducing poorly targeted exemptions, improving voluntary compliance, limiting fraudulent transactions, and strengthening the analytical and enforcement capacity of the tax administration (Atsebi *et al*., 2025; Baer, Bellon, *et al*., 2025).

VAT digitalisation represents an important part of this strategy because VAT constitutes a major institutional component of taxes on goods and services. Electronic invoicing, digital reporting, and transaction monitoring can improve traceability and facilitate risk-based auditing. However, their effectiveness depends on implementation quality and administrative capacity rather than on the formal adoption of digital systems alone.

In Romania, VAT digitalisation may be constrained by insufficient interoperability between fiscal platforms and firms' accounting systems, changes in technical requirements, inconsistent data quality, and compliance costs, particularly for small and medium-sized enterprises. Problems may also arise when taxpayers are required to submit overlapping information through multiple reporting systems or when technical interruptions create uncertainty regarding deadlines and compliance obligations.

The tax administration must also possess the analytical capacity to transform large volumes of electronic information into effective compliance interventions. Collecting transaction-level data has limited fiscal value if databases are not integrated, discrepancies are not detected promptly, and risk analysis is not connected to targeted audits. VAT digitalisation should therefore be accompanied by stable technical standards, coordinated reporting requirements, adequate transition periods, taxpayer assistance, data protection, and investment in the analytical capacity of the tax administration (European Commission, 2026c; Park & McShea, 2025).

Excise duties are another important component of TAXGS, but the present model does not estimate their independent relationship with the budget balance. Their policy relevance arises from their contribution to aggregate consumption-tax revenue and from their environmental and public-health functions.

Excise-duty reforms are subject to significant political-economy constraints. Higher excise rates may increase consumer prices, disproportionately affect lower-income households, and raise transport and production costs, particularly when applied to energy products. Reform may also face resistance from affected industries, consumers, and organised interest groups, while electoral considerations can delay or dilute politically sensitive adjustments.

Large tax differentials relative to neighbouring countries may additionally encourage cross-border purchases, illicit trade, smuggling, and avoidance. The revenue effect of excise reform therefore depends on enforcement capacity, behavioural responses, market conditions, and policy credibility. Excise adjustments should be predictable, gradual, coordinated with anti-evasion measures, and supported by assessments of their distributional, inflationary, sectoral, environmental, and public-health consequences.

Where excise reforms impose substantial burdens on vulnerable households, targeted compensatory measures are preferable to broad exemptions that weaken the tax base. Transparent and predictable indexation mechanisms may also improve policy credibility and limit discretionary changes driven by short-term political considerations.

The significant fiscal-persistence coefficient indicates that tax reforms alone are unlikely to ensure sustainable consolidation. Medium-term budgetary planning, expenditure efficiency, realistic revenue forecasting, and

systematic evaluation of tax expenditures are also required. Temporary revenue gains should not be used to finance permanent expenditure commitments unless their durability has been established.

Romania's fiscal strategy should therefore integrate revenue mobilisation with expenditure control and institutional reform. Improvements in tax collection can support fiscal consolidation only if they are not offset by recurrent expenditure overruns or inefficient public spending. Tax-policy design, digital administration, expenditure planning, and macroeconomic forecasting should consequently be coordinated within a credible medium-term fiscal framework aligned with European Union fiscal-governance requirements.

The budget balance provides an appropriate measure of annual fiscal performance, but it does not capture every dimension of fiscal sustainability. Long-term fiscal conditions also depend on public debt, interest expenditure, the primary balance, refinancing risks, contingent liabilities, and available fiscal space. The present conclusions therefore concern primarily the relationship between aggregate indirect taxation and annual budget-balance dynamics.

Potential endogeneity further limits causal interpretation. Higher TAXGS revenues may improve the budget balance, but deteriorating fiscal conditions may also induce changes in tax rates, exemptions, enforcement intensity, or digital tax-administration measures. Public expenditure, tax compliance, institutional quality, the shadow economy, and political cycles may influence both taxation and fiscal outcomes. The inclusion of the lagged budget balance captures fiscal persistence but does not eliminate reverse causality or omitted-variable bias.

The findings suggest that aggregate revenues from taxes on goods and services are positively associated with Romania's budget balance in the preferred specification. However, their fiscal effectiveness depends on administrative capacity, compliance, expenditure discipline, institutional credibility, and macroeconomic conditions. Fiscal consolidation should therefore combine efficient tax collection, prudent expenditure management, predictable policy design, and sustained institutional reform rather than relying primarily on increases in statutory tax rates.

6. CONCLUSIONS

This study examined the dynamic relationship between aggregate indirect taxation and Romania's general government budget balance over the period 2010–2025. The empirical analysis employed dynamic OLS models estimated with HC3 robust standard errors. The preferred specification included the first lag of the budget balance, revenues from taxes on goods and services, and inflation, while additional specifications introduced RGDP and a crisis-period dummy to assess coefficient stability.

The preferred dynamic model is statistically significant overall and explains a substantial proportion of the variation in Romania's budget balance. The positive and statistically significant coefficient of the lagged budget balance indicates considerable fiscal persistence. This result suggests that Romania's fiscal position adjusts gradually and that imbalances recorded in one year tend to be transmitted to the following period. Fiscal shocks may therefore have consequences extending beyond the year in which they occur, reinforcing the importance of credible medium-term consolidation strategies.

TAXGS also has a positive and statistically significant coefficient in the preferred model. Because the dependent variable is expressed as a signed budget balance, with more negative values indicating larger deficits, this result indicates that higher revenues from taxes on goods and services are associated with an improvement in the annual fiscal position. The finding supports the relevance of aggregate consumption-tax revenues for fiscal adjustment and is consistent with the broader literature emphasising their contribution to revenue mobilisation.

Nevertheless, the magnitude and statistical precision of the TAXGS coefficient are sensitive to the inclusion of RGDP and the crisis dummy. The TAXGS coefficient remains positive in all specifications but is not individually significant in the augmented models. Accordingly, the results support a positive conditional association between taxes on goods and services and the budget balance, rather than a uniform or causal effect across all specifications.

Inflation is positive but statistically insignificant in all models. This finding may reflect the opposing effects of inflation on public finances: higher prices can increase nominal tax receipts while simultaneously raising government expenditure, social transfers, procurement costs, subsidies, and interest payments. RGDP is also statistically insignificant in the augmented specifications and provides only a marginal increase in unadjusted explanatory power.

The CRISIS coefficient is negative, indicating a weaker budget balance during 2020–2023 after controlling for the

remaining variables. However, its effect is not statistically significant. The crisis-adjusted specification therefore provides directional but not conclusive evidence regarding the fiscal consequences of the COVID-19 pandemic, energy-market disruptions, and the subsequent inflationary shock.

The hypothesis concerning fiscal persistence is supported by the preferred specification. The hypothesis regarding a positive association between TAXGS and the budget balance is also supported in the preferred model, although its statistical significance is sensitive to additional controls. The hypothesis concerning the joint explanatory relevance of fiscal persistence, TAXGS, and inflation is supported by the overall robust F-test. These conclusions should be interpreted in light of the limited sample and should not be regarded as definitive evidence of causal relationships.

An important methodological contribution of the study lies in treating taxes on goods and services as an aggregate measure of indirect taxation. VAT and excise duties were not entered simultaneously with TAXGS because they represent major components of the aggregate category. This avoids conceptual overlap and substantially reduces multicollinearity concerns. The VIF results confirm that problematic multicollinearity is absent in the preferred dynamic specification.

The findings have several policy implications. Improving the effective collection of taxes on goods and services can support Romania's fiscal position, but fiscal consolidation should not rely primarily on increases in statutory tax rates. Greater emphasis should be placed on broadening the effective tax base, reducing poorly targeted exemptions, improving compliance, strengthening enforcement, and limiting the informal economy.

Although VAT and excise duties were not estimated as separate variables, they remain important institutional components of aggregate taxes on goods and services. VAT digitalisation can improve transaction traceability and risk-based auditing, but its effectiveness depends on system interoperability, stable reporting requirements, taxpayer support, data quality, and the analytical capacity of the tax administration. Digital reporting should therefore be designed to reduce rather than duplicate taxpayers' administrative obligations, particularly for small and medium-sized enterprises.

Excise-duty reforms should similarly balance revenue mobilisation with inflationary, distributional, environmental, and public-health objectives. Such reforms may face resistance from affected industries and consumers, electoral pressures, and risks of illicit trade or cross-border purchases. Predictable implementation, effective enforcement, and targeted assistance for vulnerable households are therefore essential for maintaining both revenue effectiveness and public acceptance.

More broadly, the fiscal-persistence result indicates that improving tax collection alone is unlikely to ensure sustainable consolidation. Revenue reforms should be integrated with expenditure efficiency, realistic forecasting, medium-term budgetary planning, and systematic evaluation of tax expenditures. Temporary revenue gains should not be used to finance permanent expenditure commitments unless their durability has been established.

6.1. Limitations

Several limitations should be considered when interpreting the findings. First, the analysis relies on a short annual series covering 2010–2025. The initial dataset contains 16 observations and decreases to 15 usable observations after introducing the lagged dependent variable. This limited time dimension reduces statistical power, restricts the number of parameters that can be estimated reliably, and makes individual coefficients sensitive to the inclusion of additional controls.

The use of annual data may also conceal fiscal adjustments occurring within individual years. This limitation is particularly relevant during the COVID-19 pandemic and energy crisis, when government revenues and expenditures changed rapidly. Although the CRISIS dummy accounts for the combined exceptional period of 2020–2023, it cannot distinguish the separate effects of the pandemic, energy-support measures, and the inflationary shock. Excluding all crisis years would have reduced the sample further and generated estimates based on an insufficient number of observations.

Second, the study uses the general government budget balance as its principal fiscal sustainability indicator. This measure was selected because it directly captures annual revenue–expenditure dynamics and is aligned with the research question. Nevertheless, fiscal sustainability is multidimensional, and the budget balance alone cannot provide a complete assessment of long-term fiscal conditions.

The debt-to-GDP ratio would offer a stock-based perspective by incorporating accumulated deficits,

interest expenditure, nominal growth, valuation effects, and stock-flow adjustments. The primary balance would provide information on discretionary fiscal performance excluding interest expenditure. Broader measures of fiscal space could additionally capture borrowing costs, debt maturity, contingent liabilities, institutional credibility, and the government's capacity to adjust taxation or expenditure. The absence of these complementary indicators limits the scope of the present conclusions to annual budget-balance dynamics.

Third, the selected models include only a restricted set of fiscal and macroeconomic variables. Public expenditure composition, tax compliance, tax expenditures, the shadow economy, institutional quality, fiscal rules, electoral cycles, and political constraints may affect both indirect tax revenues and the budget balance. Their exclusion may generate omitted-variable bias.

Fourth, potential endogeneity limits causal interpretation. Higher TAXGS revenues may improve the budget balance, but deteriorating fiscal conditions may also induce the government to modify tax rates, reduce exemptions, broaden the tax base, or strengthen enforcement. The inclusion of the lagged budget balance captures fiscal persistence but does not eliminate reverse causality.

Fifth, the study is restricted to Romania. The results reflect the country's specific tax structure, administrative capacity, fiscal institutions, and exposure to recent economic shocks. They should therefore not be generalised automatically to other European Union Member States.

Finally, the diagnostic results indicate residual serial correlation and possible functional-form misspecification. HC3 standard errors provide protection against heteroskedasticity and high-leverage observations but do not correct serial correlation, omitted variables, or an inappropriate functional form. These diagnostic findings reinforce the need for cautious interpretation and prevent the estimated relationships from being treated as definitive causal effects.

6.2. Future Research Directions

Future research should first extend the dataset by employing quarterly observations over a longer period. A higher-frequency series would increase statistical power, provide more degrees of freedom, and permit the separate identification of pandemic, energy-crisis, and inflation-related fiscal adjustments.

Subject to the integration and cointegration properties of the variables, a longer quarterly dataset could support the application of Autoregressive Distributed Lag models to distinguish short-run dynamics from long-run relationships. If the variables are integrated of the same order and cointegrated, Vector Error Correction Models could be employed to examine adjustment towards a long-run fiscal equilibrium. These methods were not applied in the present study because the short annual series would not support reliable estimation of parameter-intensive dynamic specifications.

Future studies should also incorporate complementary measures of fiscal sustainability, including the debt-to-GDP ratio, the primary balance, interest expenditure, debt-servicing capacity, and broader measures of fiscal space. Estimating comparable models for several fiscal outcomes would provide a more comprehensive assessment of both short-term fiscal performance and long-term debt sustainability.

Potential endogeneity should be addressed through research designs capable of improving causal identification. Granger-causality tests based on a longer time series could examine whether changes in indirect tax revenues precede changes in the budget balance or whether fiscal deterioration precedes tax-policy adjustments. These tests would identify temporal precedence but would not, by themselves, establish structural causality.

Instrumental-variable estimation could additionally be considered if credible and statistically valid external instruments can be identified. Potential candidates may include predetermined legislative reforms, plausibly exogenous EU-driven tax-harmonisation requirements, or staggered implementation of digital tax-administration measures. Any proposed instruments would require formal tests of relevance, validity, and exclusion restrictions.

Further research could incorporate indicators of VAT compliance, the VAT gap, digital tax-administration performance, tax arrears, audit effectiveness, the informal economy, institutional quality, and expenditure efficiency. These variables could help explain why similar tax-revenue levels produce different fiscal outcomes depending on administrative and institutional capacity.

Finally, extending the analysis to a panel of European Union Member States would increase the number of observations and allow the role of tax structure,

institutional quality, economic development, and fiscal rules to be compared across countries. Dynamic panel estimators and panel cointegration methods could then provide additional evidence regarding the mechanisms linking indirect taxation and fiscal sustainability.

The study shows that aggregate revenues from taxes on goods and services are positively associated with Romania's annual budget balance in the preferred dynamic specification. However, sustainable fiscal consolidation requires more than higher tax revenues. It depends on effective tax administration, prudent expenditure management, credible institutions, coherent medium-term planning, and a macroeconomic environment capable of supporting stable public finances.

AUTHOR'S CONTRIBUTION STATEMENT

Conceptualization: V.M.A., C.F. and L.P.; Methodology: V.M.A., C.F. and L.P.; Software: V.M.A., C.F. and L.P.; Validation: V.M.A., C.F. and L.P.; Formal Analysis: V.M.A., C.F. and L.P.; Investigation: V.M.A., C.F. and L.P.; Resources: V.M.A., C.F. and L.P.; Data Curation: V.M.A., C.F. and L.P.; Writing – Original Draft Preparation: V.M.A., C.F. and L.P.; Writing – Review & Editing: V.M.A., C.F. and L.P.; Visualization: V.M.A., C.F. and L.P.; Supervision: V.M.A., C.F. and L.P.; Project Administration: V.M.A., C.F. and L.P. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST STATEMENT

The authors declare no conflict of interest.

REFERENCES

[1] Abd Hakim, T., Karia, A. A., David, J., Ginsad, R., Lokman, N., & Zolkafli, S. (2022). Impact of direct and indirect taxes on economic development: A comparison between developed and developing countries. Cogent Economics & Finance, 10(1), 2141423. https://doi.org/10.1080/23322039.2022.2141423

[2] Afonso, A., Alves, J., & Coelho, J. C. (2025). Determinants of the degree of fiscal sustainability. International Journal of Finance & Economics, 30(2), 1190–1205. https://doi.org/https://doi.org/10.1002/ijfe.2960

[3] Angelov, A., & Nikolova, V. (2025). Causality Between the Tax Burden of Direct Taxes and Economic Growth in European Union Countries with Proportional Taxation. Journal of Risk and Financial Management, 18(11), 626. https://doi.org/10.3390/jrfm18110626

[4] Athanasios, A., Charalampos, K., & Eleni, K. (2022). Assessing the effectiveness of tax administration in macroeconomic stability: evidence from 26 European Countries. Economic Change and Restructuring, 55(4), 2237–2261. https://doi.org/10.1007/s10644-022-09384-6

[5] Atsebi, J.-M. B., Gueorguiev, N., & Nose, M. (2025). Enhancing Tax Capacity: Revenue Gains from Strengthening Tax Administration. IMF Working Papers, 2025(219), A001. https://doi.org/10.5089/9798229029827.001.A001

[6] Auerbach, A. J. (2025). Public Finance Implications of Economic Inequality. Journal of Economic Perspectives, 39(2), 149–170. https://doi.org/10.1257/jep.20241421

[7] Badiu (Cazacu), C. E., Bărbuță-Mișu, N., Chirita, M., Soare, I., Zlati, M. L., Fortea, C., & Antohi, V. M. (2024). Modelling the Impact of VAT Fiscality on Branch-Level Performance in the Construction Industry-Evidence from Romania. In Economies (Vol. 12, Issue 2). https://doi.org/10.3390/economies12020030

[8] Baer, K., Barra, P. A., & Benitez, J. C. (2025). Closing the Gap: How Tax Administration Performance Shapes Compliance. IMF Working Papers, 2025(209), A001. https://doi.org/10.5089/9798229027076.001.A001

[9] Baer, K., Bellon, M., Davies, M., de Mooij, R., Gaspar, V., Lemgruber, A., Mansour, M., Sawadogo, F., Takebe, M., & Vellutini, C. (2025). Building Tax Capacity for Growth and Development: Evidence-Based Analysis for Mobilizing Domestic Revenue. Departmental Papers, 2025(007), A001. https://doi.org/10.5089/9798229027298.087.A001

[10] Balasoiu, N., Chifu, I., & Oancea, M. (2023). Impact of Direct Taxation on Economic Growth: Empirical Evidence Based on Panel Data Regression Analysis at the Level of Eu Countries. In Sustainability (Vol. 15, Issue 9). https://doi.org/10.3390/su15097146

[11] Buthelezi, E. M. (2025). Evaluating government debt thresholds and fiscal consolidation: insights from Organisation for Economic Co-operation and Development countries. Macroeconomic Dynamics, 29, e116. https://doi.org/DOI: 10.1017/S1365100525100205

[12] Chifu, I. C., & Păun, D. (2026). Fiscal Sustainability and Macroeconomic Resilience in an Emerging EU Economy: Growth, Debt, and the Twin Deficit Trap in Romania. In Sustainability (Vol. 18, Issue 13, p. 6572). https://doi.org/10.3390/su18136572

[13] Ciaffi, G., Deleidi, M., & Di Domenico, L. (2024). Fiscal policy and public debt: Government investment is most effective to promote sustainability. Journal of Policy Modeling, 46(6), 1186–1209. https://doi.org/https://doi.org/10.1016/j.jpolmod.2024.07.002

[14] Cifuentes-Faura, Javier, & Simionescu, Mihaela. (2024). Analyzing the Importance of the Determinants of Public Debt and Its Policy Implications: A Survey of Literature. Public Finance Review, 52(3), 345–375. https://doi.org/10.1177/10911421231215019

[15] Cnossen, S. (2022). The C-inefficiency of the EU-VAT and what can be done about it. International Tax and Public Finance, 29(1), 215–236. https://doi.org/10.1007/s10797-021-09683-0

[16] Cochrane, J. H. (2022). The fiscal roots of inflation. Review of Economic Dynamics, 45, 22–40. https://doi.org/https://doi.org/10.1016/j.red.2021.06.002

[17] Cornevin, A., Corrales, J. S., & Mojica, J. P. A. (2024). Do tax revenues track economic growth? Comparing panel data estimators. Economic Modelling, 140, 106867. https://doi.org/https://doi.org/10.1016/j.econmod.2024.106867

[18] Dabla-Norris, E., & Lima, F. (2023). Macroeconomic effects of tax rate and base changes: Evidence from fiscal consolidations. European Economic Review, 153, 104399. https://doi.org/https://doi.org/10.1016/j.euroecorev.2023.104399

[19] De Vito, A., Hillmann, L., Jacob, M., & Vossebürger, R. (2025). Do personal income taxes affect corporate tax-motivated profit shifting? Journal of Accounting and Economics, 79(2), 101758. https://doi.org/https://doi.org/10.1016/j.jacceco.2024.101758

[20] Dolls, M., Fuest, C., Peichl, A., & Wittneben, C. (2022). Fiscal Consolidation and Automatic Stabilization: New Results. In IMF Economic Review (Vol. 70, Issue 3, pp. 420–450). https://doi.org/10.1057/s41308-022-00162-y

[21] Dragos, S. L., Mara, E. R., Mare, C., & Munteanu, S. (2025). Non-linear effects of fiscal policy in European welfare states. Economic Analysis and Policy, 88, 557–586. https://doi.org/https://doi.org/10.1016/j.eap.2025.09.024

[22] Đurović Todorović, J., Đorđević, M., Mirović, V., Kalaš, B., & Pavlović, N. (2024). Modeling Tax Revenue Determinants: The Case of Visegrad Group Countries. In Economies (Vol. 12, Issue 6, p. 131). https://doi.org/10.3390/economies12060131

[23] Ebaidalla, E. M. (2024). Impact of indirect taxes on CO2 emissions in the presence of institutional quality: evidence from a global panel data analysis. Management of Environmental Quality: An International Journal, 35(4), 729–750. https://doi.org/10.1108/MEQ-08-2023-0290

[24] Ermuxammadovich, S. X. (2024). Excise Tax Administration and Its Improvement. European Journal of Research Development and Sustainability, 5(5), 5–7.

[25] European Central Bank. (2023). Fiscal policy and high inflation. https://www.ecb.europa.eu/press/economic-bulletin/articles/2023/html/ecb.ebart202302_01~2bd46eff8f.en.html

[26] European Commission. (2022). Taxation trends in the European Union. https://doi.org/10.2778/417176 KP-DU-22-001-EN-N

[27] European Commission. (2025). EU VAT Gap Report. https://taxation-customs.ec.europa.eu/taxation/vat/fight-against-vat-fraud/vat-gap_en

[28] European Commission. (2026a). Country report - Romania. https://economy-finance.ec.europa.eu/economic-surveillance-eu-member-states/country-pages-including-country-reports/country-report-romania_en

[29] European Commission. (2026b). Economic forecast for Romania. https://economy-finance.ec.europa.eu/economic-surveillance-eu-member-states/country-pages-including-country-reports/romania/economic-forecast-romania_en

[30] European Commission. (2026c). Stability and Growth Pact. https://economy-finance.ec.europa.eu/economic-governance-framework/stability-and-growth-pact_en

[31] European Commission. (2026d). The European Semester. https://commission.europa.eu/topics/economy-and-euro/european-semester_en

[32] European Commission. (2026e). Value Added Tax (VAT) - Taxation and Customs Union. https://taxation-customs.ec.europa.eu/taxation/vat_en

[33] European Union. (2024). 2024 Country Report - Romania Accompanying the document Recommendation for a COUNCIL RECOMMENDATION on the economic, social, employment, structural and budgetary policies of Romania. https://op.europa.eu/en/publication-detail/-/publication/5045e494-2e4a-11ef-a61b-01aa75ed71a1/language-en

[34] Eyraud, L., Gandhi, M., Hodge, A., Magistretti, G., Stuart, I., Wang, M., & Yoo, J. (2026). Europe's Fiscal Squeeze. Departmental Papers, 2026(012), 1. https://doi.org/10.5089/9798229049306.087

[35] Fortea, C. (2025). Government Revenue Structure and Fiscal Performance in the G7: Evidence from a Panel Data Analysis. In World (Vol. 6, Issue 3). https://doi.org/10.3390/world6030097

[36] Isla-Castillo, F., Montes-Caparrós, A. P., & Domínguez-Martínez, J. M. (2026). Convergence analysis of the tax burden and economic development in OECD countries: a causality analysis. Socio-Economic Planning Sciences, 105, 102452. https://doi.org/https://doi.org/10.1016/j.seps.2026.102452

[37] Izabela Diana, G. (2026). Twin deficits and Romania's macroeconomic vulnerability: an assessment in the context of current economic challenges. Analele Universităţii Constantin Brâncuşi Din Târgu Jiu : Seria Economie, 1. https://doi.org/10.65631/jes.1.2026.10

[38] Jalles, J. T., Kiendrebeogo, Y., Lam, R., & Piazza, R. (2024). Revisiting the countercyclicality of fiscal policy. Empirical Economics, 67(3), 877–914. https://doi.org/10.1007/s00181-024-02586-z

[39] Jemiluyi, O. O., & Jeke, L. (2023). Tax revenue mobilization effort in Southern African Development Community (SADC) bloc: Does ICT matter? Cogent Economics & Finance, 11(1), 2172810. https://doi.org/10.1080/23322039.2023.2172810

[40] Levy Yeyati, E., & Sturzenegger, F. (2023). A balance-sheet approach to fiscal sustainability. Fiscal Studies, 44(1), 61–84. https://doi.org/https://doi.org/10.1111/1475-5890.12319

[41] Long, L. W., Rabab, B., & Jamil, M. N. (2025). Government spending, political dynamics, and economic recovery: a cross-national analysis of fiscal resilience. Research in Globalization, 11, 100297. https://doi.org/https://doi.org/10.1016/j.resglo.2025.100297

[42] Manthey, J., Gobiņa, I., Isajeva, L., Neneman, J., Reile, R., Štelemėkas, M., & Rehm, J. (2024). The Impact of Raising Alcohol Taxes on Government Tax Revenue: Insights from Five European Countries. Applied Health Economics and Health Policy, 22(3), 363–374. https://doi.org/10.1007/s40258-024-00873-5

[43] Marattin, L., Nannicini, T., & Porcelli, F. (2022). Revenue vs expenditure based fiscal consolidation: the pass-through from federal cuts to local taxes. International Tax and Public Finance, 29(4), 834–872. https://doi.org/10.1007/s10797-021-09682-1

[44] Marín-Rodríguez, N. J., Gonzalez-Ruiz, J. D., & Botero, S. (2023). Assessing Fiscal Sustainability in the Landscape of Economics Research. In Economies (Vol. 11, Issue 12, p. 300). https://doi.org/10.3390/economies11120300

[45] Martin, R. S. (2025). Democratic Aggregation: Issues and Implications for Consumer Price Indexes. Review of Income and Wealth, 71(1), e12703. https://doi.org/https://doi.org/10.1111/roiw.12703

[46] Mascagni, G., Dom, R., Santoro, F., & Mukama, D. (2023). The VAT in practice: equity, enforcement, and complexity. International Tax and Public Finance, 30(2), 525–563. https://doi.org/10.1007/s10797-022-09743-z

[47] Mihai, D. G., Dumitrescu, B. A., & Bozagiu, A.-M. (2025). Fiscal Sustainability and the Informal Economy: A Non-Linear Perspective. In Journal of Risk and Financial Management (Vol. 18, Issue 4). https://doi.org/10.3390/jrfm18040207

[48] Mutai, N. C., Ibeh, L., Farag, K., Popoola, O. M., & Okpokiri, J. A. (2026). Public Debt Sustainability in the Eurozone: An Empirical Assessment Using Macroeconomic Indicators. In Economies (Vol. 14, Issue 2, p. 53). https://doi.org/10.3390/economies14020053

[49] Mwakalila, E. (2026). Does fiscal policy amplify or mitigate debt vulnerabilities? Evidence from Tanzania's government revenue and expenditure dynamics. Social Sciences & Humanities Open, 14, 103100. https://doi.org/https://doi.org/10.1016/j.ssaho.2026.103100

[50] Ndiaye, S. N., Doulla Harouna, Z., Sow Badji, A., & Sène, B. (2026). Governance and Fiscal Sustainability: Evidence from Developed and Emerging Economies. In International Journal of Financial Studies (Vol. 14, Issue 3, p. 70). https://doi.org/10.3390/ijfs14030070

[51] OECD. (2024). Consumption Tax Trends 2024: VAT/GST and Excise, Core Design Features and Trends. https://doi.org/https://doi.org/10.1787/dcd4dd36-en

[52] OECD. (2025). Sustainability of public finances in OECD countries: From fiscal consolidation to state redesign? https://doi.org/https://doi.org/10.1787/df89a38a-en

[53] OECD. (2026). Restoring Public Finances: Enabling Effective Government. https://doi.org/https://doi.org/10.1787/fbcf9161-en.

[54] Okoth, E., Oncel, A., & Degirmenci, T. (2025). Is there a limit to taxation? Tax capacity and growth in the East African Community. Annals of Public and Cooperative Economics, n/a(n/a). https://doi.org/https://doi.org/10.1111/apce.70035

[55] Park, Y., & McShea, M. F. (2025). Understanding the Roles Tax Advisory Professionals Play in the Digitalization of Tax Administration: Mechanisms of Influence in Global Reform Contexts. Digit. Gov.: Res. Pract., 6(4). https://doi.org/10.1145/3778034

[56] Parui, P. (2024). Fiscal expansion, government debt and economic growth: a post-Keynesian perspective. Journal of Post Keynesian Economics, 47(1), 117–154. https://doi.org/10.1080/01603477.2023.2221444

[57] Pavlopoulos, A., Mertzanis, C., & Vetsikas, A. (2026). Governance Through Taxation: Fiscal Efficiency and Its Disciplinary Effect on Earnings Management. Abacus, n/a(n/a). https://doi.org/https://doi.org/10.1111/abac.70039

[58] Primorac, M., Vlah Jerić, S., & Davidović, M. (2025). Effects of specific versus ad valorem excise taxes: empirical evidence on cigarette pricing in the EU. Empirica, 52(2), 357–376. https://doi.org/10.1007/s10663-024-09637-9

[59] Raouf, E. (2026). Determinants of Nontax Revenue Buoyancy in Middle-Income Countries: The Role of Money Supply and Corporate Profitability. Journal of Public Affairs, 26(2), e70120. https://doi.org/https://doi.org/10.1002/pa.70120

[60] Seghini, C. (2026). The Macroeconomics of Climate Change and Public Debt Sustainability: Mapping Transition and Physical Risks Through Output Growth, Primary Balances, and Real Rates. Journal of Economic Surveys, n/a(n/a). https://doi.org/https://doi.org/10.1111/joes.70060

[61] Sentinelo, T., Queirós, M., Oliveira, J. M., & Ramos, P. (2025). Tax Optimization in the European Union: A Laffer Curve Perspective. In Economies (Vol. 13, Issue 12, p. 359). https://doi.org/10.3390/economies13120359

[62] Sojoodi, S., & Alamdari, M. T. (2026). Investigating the causal relationship between tax revenues and institutional quality. Evolutionary and Institutional Economics Review. https://doi.org/10.1007/s40844-025-00326-1

[63] Tax Foundation Europe. (2024a). Digital Taxation around the World. https://taxfoundation.org/research/all/global/digital-taxation/

[64] Tax Foundation Europe. (2024b). The Impact of High Inflation on Tax Revenues across Europe. https://taxfoundation.org/research/all/eu/high-inflation-tax-revenue-europe/

[65] von Schiller, A. (2024). Which Messages Motivate Tax Compliance in Low Administrative Capacity Settings? Experimental Evidence From Two Mozambican Municipalities. Journal of Public Affairs, 24(4), e2960. https://doi.org/https://doi.org/10.1002/pa.2960

[66] Wen, J., Mahmood, H., Khalid, S., & Zakaria, M. (2025). Nexus Between Digital Economy and Environmental Sustainability in BRICS: Does Green Innovation Matter? Business Strategy and the Environment, n/a(n/a). https://doi.org/https://doi.org/10.1002/bse.4243

[67] World Bank. (2023). Romania - Systematic Country Diagnostic. Romania - Systematic Country Diagnostic Update. https://doi.org/10.1596/40192

[68] Zabavnik, D., & Verbič, M. (2025). Revisiting the impact of financial shocks on the fiscal position of euro area countries. Economic Analysis and Policy, 86, 622–635. https://doi.org/https://doi.org/10.1016/j.eap.2025.03.048

©2026 Antohi *et al*. Published by Journal of Global Economics, Public Policy and Development. This is an open access article licensed under the terms of the Creative Commons Attribution Non-Commercial License which permits unrestricted, non-commercial use, distribution and reproduction in any medium, provided the work is properly cited. (http://creativecommons.org/licenses/by-nc/4.0/)