SUSTAINABILITY OF THE EUROPEAN UNION'S FISCAL CONVERGENCE CRITERIA[1]

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ABSTRACT

The paper examines the sustainability of the European Union's fiscal convergence criteria, and the relationship between fiscal conditions and indirect-tax revenues. The empirical analysis uses an unbalanced panel of 27 EU Member States for 2012-2020, the longest common period available for public debt, the budget balance, real GDP growth, inflation, long-term interest rates, the statutory VAT rate, and a broad indirect-tax revenue indicator. Two-way fixed-effects estimates are reported with country-clustered standard errors and Driscoll-Kraay sensitivity checks. In the preferred revenue specification, lagged public debt is positively and statistically significantly associated with indirect-tax revenues; the statutory VAT rate is also positive and statistically significant, while inflation is positive with borderline significance under country-clustered inference. Lagged budget balance, growth, and long-term interest rates are not statistically significant in that model. The results document conditional relationships rather than causal policy responses. Restricted-instrument difference-GMM estimates are presented only as sensitivity evidence because the short time dimension and borderline diagnostics limit inference. Taken together with the institutional analysis, the empirical findings are consistent with retaining the Maastricht reference values as fiscal anchors, provided that they are complemented by country-specific debt adjustment paths, credible medium-term planning, growth-enhancing investment, and stronger institutional capacity.

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1. INTRODUCTION

The European Union represents the most advanced and most complex form of regional economic integration in the contemporary world economy. Over several decades, the European integration process has evolved from a customs union and a common market into an institutional system encompassing a single market, a common monetary policy, the coordination of fiscal policies, and an increasingly developed mechanism of economic governance (Popović and Erić, 2021). Within such a system, fiscal policy plays a particularly important role, since Member States retain a high degree of fiscal sovereignty, while monetary policy in the euro area operates centrally through the European Central Bank.

The Maastricht Treaty and the Stability and Growth Pact established the reference limits of fiscal discipline: a budget deficit of up to 3% of GDP and public debt of up to 60% of GDP. These values were designed as an instrument for safeguarding the stability of the monetary union, preventing negative spillover effects from national budgets to other Member States, and preserving confidence in the common currency. However, the contemporary period shows that nominally identical fiscal rules are applied to highly diverse economies, characterised by different levels of productivity, competitiveness, institutional efficiency, and demographic pressures.

The 2008 financial crisis, followed by the euro area sovereign debt crisis, the COVID-19 pandemic, the energy crisis, the war in Ukraine, and the tightening of monetary policy after the inflationary wave, has raised the question of whether fiscal sustainability can be measured exclusively by static debt and deficit thresholds. During these crises, Member States had to increase public expenditure in order to preserve employment, healthcare systems, corporate liquidity, and social stability. In this way, fiscal policy once again confirmed its stabilisation function, but at the same time placed an additional burden on public finances (European Commission, 2024).

According to Eurostat's first notification for 2025, the euro area deficit amounted to 2.9% of GDP, while the EU deficit stood at 3.1% of GDP. Furthermore, euro area public debt amounted to 87.8% of GDP, whereas EU public debt stood at 81.7% of GDP (Eurostat, 2026). These data clearly show that the average indebtedness of both the European Union and the euro area remains above the Maastricht reference value. It is particularly important that the most indebted Member States are also large or systemically important economies, such as Greece, Italy, France, Belgium, and Spain. This means that fiscal sustainability is no longer merely a matter of individual national policies, but also a question of the stability of the monetary union as a whole.

Under such conditions, value added tax assumes particular importance. VAT is one of the most productive and stable sources of public revenue in European fiscal systems. When countries have limited room for additional borrowing and are required to reduce deficits, indirect taxes often become an instrument of fiscal consolidation. However, increasing indirect taxation may have regressive social effects and may negatively affect aggregate demand, thereby creating a dilemma between fiscal stability and economic growth.

The subject of this paper is the analysis of the sustainability of the European Union's fiscal convergence criteria through the relationship between public debt, the budget deficit, macroeconomic indicators, and revenues from indirect taxation. Particular attention is devoted to the empirical findings of the panel analysis, as well as to the contemporary reform of the European Union's fiscal rules adopted in 2024.

The aim of the paper is to link the theoretical foundations of the European Union's fiscal policy, existing empirical findings, and current data on debt and deficits, and to propose directions for reforming the fiscal framework in a way that both preserves discipline and enables investment. The central empirical hypothesis is that higher public debt is associated with higher broad indirect - tax revenues after controlling for macroeconomic conditions, country and year-specific effects. The paper does not interpret this relationship as evidence that governments deliberately increase VAT or other indirect taxes in response to debt. Long-term fiscal sustainability is considered in relation to economic growth, financing conditions, institutional capacity, and the composition of public expenditure.

1.1. Literature Review and Previous Research

1.1.1. Theoretical Framework: Fiscal Stabilisation and Fiscal Federalism

Classical public finance theory views fiscal policy through three basic functions: allocative, redistributive, and stabilisation. The allocative function refers to the provision of public goods and the correction of market failures; the redistributive function concerns the distribution of income; and the stabilisation function relates to the impact of budgets and taxes on aggregate demand, employment, inflation, and cyclical fluctuations.

In the European Union, the stabilisation function of fiscal policy is of additional importance because euro area Member States do not have their own independent monetary policy. The theory of fiscal federalism, particularly in the works of Musgrave (1973) and Oates (2008), emphasises that fiscal functions should be

allocated among different levels of government in accordance with efficiency, accountability, and the capacity to internalise external effects.

In the European Union, this theory assumes a specific form: monetary policy is centralised, while taxation, budgetary expenditure, and borrowing remain largely national competences. Therefore, the European fiscal system is based on coordination, surveillance, and rules, rather than on a full fiscal union.

Convergence Criteria and the Stability and Growth Pact

The European Commission explains that the convergence criteria were agreed upon in Maastricht in 1991 and that they relate to price stability, sustainable public finances, exchange-rate stability, and long-term interest rates (European Commission, 2026a). The legal basis of the Stability and Growth Pact is found in Articles 121 and 126 of the Treaty on the Functioning of the European Union, while Protocol No. 12 defines the reference values for the deficit and public debt (European Commission, 2026b; European Commission, 2026c).

In conclusion, the evolution of economic theory on fiscal rules can be summarised as a shift from the initial optimism surrounding the Maastricht framework toward structural and macroeconomic criticism. While authors such as Buti and Giudice (2002) view the rules as a successful mechanism for ensuring discipline, critics such as Feldstein (2005) and Stiglitz (2016) emphasise their rigidity, neoliberal ideology, and negative impact on peripheral markets. A contemporary shift is introduced by Blanchard (2019), who, from the perspective of interest rates being lower than the economic growth rate ($r < g$), questions the necessity of strict numerical limits under the Maastricht framework.

Public Debt and Economic Growth in the Empirical Literature

The relationship between public debt and growth is one of the most widely debated issues in contemporary macroeconomics. Reinhart and Rogoff (2010) argued that high levels of public debt may be associated with slower economic growth. Their finding of a threshold of around 90% of GDP had a major influence on fiscal consolidation policies after the financial crisis. However, the later replication by Herndon, Ash, and Pollin (2014) pointed to methodological problems, data selection issues, and questions of weighting, concluding that the relationship between debt and growth is not universal and depends on the period, the country, and the structure of the economy.

Blanchard (2019), as already noted, further relativised the classical aversion to high public debt under conditions in which the interest rate is lower than the economic growth rate. According to this approach, public debt may remain

sustainable even at higher levels if the economy achieves growth that exceeds the cost of debt servicing.

Fiscal Consolidation, Indirect Taxes, and VAT

In recent empirical research, particular importance has been attached to VAT as a large and relatively stable fiscal resource. This approach is consistent with the practice of EU Member States, where indirect taxes represent an important share of public revenues. The advantage of VAT lies in its broad tax base and relatively efficient collection, while its weakness is reflected in its potentially regressive effect on the population and its possible negative impact on consumption. According to Your Europe (2026), the standard VAT rate in the EU may not be lower than 15%, while each Member State determines its own rates within the rules of the VAT Directive.

The literature on fiscal consolidation is not unanimous. Alesina, Favero, and Giavazzi (2018) emphasis

that expenditure-based consolidations may have less negative effects on growth than tax-based consolidations. By contrast, Keynesian approaches warn that reducing public expenditure during a recession may further weaken aggregate demand. In the European context, the key issue is the structure of consolidation: taxes and expenditures cannot be viewed solely in accounting terms, but also through their impact on investment, consumption, productivity, and social stability (Alesina et al, 2017; Alesina and Perotti, 1997).

The Reform of the European Union's Fiscal Framework after 2024

On 29 April 2024, the Council of the European Union adopted three legislative acts reforming the framework for economic and fiscal governance. The reform introduces national medium-term fiscal-structural plans, the net expenditure path as the central operational indicator, and a more flexible approach to debt adjustment, while maintaining the reference values of 3% and 60% (Council of the European Union, 2024a; Council of the European Union, 2024b; European Fiscal Board, 2024; European Parliament and Council, 2024).

The new rules represent an important shift: instead of applying the same pace of consolidation to all countries, they introduce an approach that, to a certain extent, takes into account the specific fiscal risks of each Member State. This confirms the central assumption of this paper that the sustainability of fiscal criteria does not depend solely on numerical limits, but on the real capacity of an economy to reduce debt without undermining growth and investment.

2. MATERIALS AND METHODS

Data Sources. The empirical basis of the paper consists of data on real GDP growth, public debt, budget balance, inflation, long-term interest rates, and revenues from indirect taxes. In addition, this research incorporates updated Eurostat data from the 2025 EDP notification, which are used to broaden the discussion and assess the current fiscal position of the EU. Besides these data, the sources also include institutional sources of the European Commission: VAT Rates/TEDB for the normative framework of VAT rates and the Fiscal Governance Database for national fiscal rules (European Commission, 2025a; European Commission, 2025b).

In the applied models, the longest common period in which all core variables overlap is 2012-2020. The panel covers 27 EU Member States and is unbalanced because long-term interest-rate observations are missing for Estonia during part of the period. Descriptive statistics and correlations below use all available variable-level observations within 2012 - 2020 (243 observations for most variables and 235 for the long-term interest rate). The preferred VAT- rate and indirect-tax revenue regressions contain 209 observations after applying one-year lags and listwise deletion, while models that do not require lagged fiscal regressors contain up to 235 observations.

Definition and Explanation of Variables

The table below presents the key variables used in the panel econometric analysis of the fiscal sustainability of EU Member States. The variables are grouped in a way that covers fiscal indicators, macroeconomic conditions, and tax policy.

A particularly important distinction is made between the variables vat_rate and vat_rev. The variable vat_rate represents the legally defined standard VAT rate and therefore captures an institutional tax-policy parameter. The variable vat_rev is a broad indirect-tax revenue indicator expressed relative to GDP; VAT is an important component of this revenue category, but vat_rev should not be interpreted as pure VAT receipts. Its variation may reflect the statutory rate, consumption and the tax base, inflation, collection efficiency, compliance, and other components of indirect taxation.

The variables *debt* and *budg_bal* represent the main indicators of fiscal stability. Higher public debt and a larger budget deficit increase fiscal pressure and the need for additional public revenues. By contrast, higher real GDP growth (*gdp_g*) contributes to reducing the relative burden of public debt and strengthening fiscal sustainability. Inflation (*inf*) affects nominal tax revenues and borrowing costs, while the long-term interest rate (*int*) represents the cost of financing public

debt. An increase in interest rates raises debt-servicing costs and may place an additional burden on public finances.

Table 1 Operationalisation of Variables

Variable	Notation	Explanation	Expected Effect
VAT/indirect tax revenues (% of GDP)	vat_rev	Fiscal outcome of indirect taxation; depends on the tax rate, tax base, and collection efficiency.	Increases with fiscal pressure, but also with consumption and inflation.
Standard VAT rate (%)	vat_rate	Statutory tax rate applied by the state to most goods and services.	Responds more slowly than revenues; any change represents an institutional policy decision.
Public debt (% of GDP)	debt	Consolidated gross debt of the general government.	Higher debt may be associated with greater fiscal pressure and a stronger need for revenue mobilisation.
Budget balance (% of GDP)	budg_bal	A negative value indicates a deficit, while a positive value indicates a surplus.	A better balance may strengthen fiscal stability; a deficit worsens the debt position.
Real GDP growth (%)	gdp_g	Annual real growth rate.	Higher growth reduces relative indebtedness and fiscal pressure.
Inflation (%)	inf	Annual average change in prices.	Affects nominal revenues, but also interest rates and costs.
Long-term interest rate (%)	int	Cost of long-term borrowing.	Higher interest rates make debt servicing more difficult.

Source: authors' compilation based on International Monetary Fund (2025), European Commission (2025a, 2025b), and Eurostat (2025, 2026).

Model Specifications

Four core two-way fixed-effects models were estimated, supplemented by two restricted-instrument difference - GMM sensitivity models. In the static specifications, α_i denotes country fixed effects and λ_t denotes year fixed effects. The first model explains the statutory VAT rate and uses one-year lags of debt and the budget balance to reduce contemporaneous feedback:

$$vat_rate_{it} = \alpha_i + \lambda_t + \beta_1 debt_{i,t-1} + \beta_2 budg_bal_{i,t-1} + \beta_3 gdp_g_{it} + \beta_4 \inf_{it} + \beta_5 \mathrm{int}_{it} + \varepsilon_{it} \quad ..(1)$$

The second and preferred revenue specification explains broad indirect-tax revenues and additionally controls for the statutory VAT rate:

$$vat_rev_{it} = \alpha_i + \lambda_t + \beta_1 debt_{i,t-1} + \beta_2 budg_bal_{i,t-1} + \beta_3 vat_rate_{i,t} + \beta_4 gdp_g_{it} + \\ + \beta_5 inf_{it} + \beta_6 int_{it} + \varepsilon_{it} \quad (2)$$

The third and fourth core specifications examine real GDP growth and the contemporaneous correlates of public debt, respectively. Both are estimated as two-way fixed-effects models:

$$gdp_g_{it} = \alpha_i + \lambda_t + \beta_1 debt_{i,t-1} + \beta_2 budg_bal_{it} + \beta_3 vat_rev_{it} + \beta_4 inf_{it} + \beta_5 int_{it} + \varepsilon_{it} \quad ...(3)$$

$$debt_{it} = \alpha_i + \lambda_t + \beta_1 budg_bal_{it} + \beta_2 gdp_g_{it} + \beta_3 vat_rev_{it} + \beta_4 inf_{it} + \beta_5 int_{it} + \varepsilon_{it} \quad .....(4)$$

Because debt and revenues may be persistent and jointly endogenous, two first-difference GMM models are reported only as sensitivity checks: one with public debt and one with broad indirect-tax revenue as the dependent variable, each including its lagged dependent variable and a collapsed, restricted instrument set. Instrument counts are kept below the number of countries and are reported together with the Arellano - Bond AR(1) and AR(2) tests and the Sargan overidentification test. These models are not treated as confirmatory evidence when the required serial-correlation pattern or instrument diagnostics are weak or borderline.

3. RESULTS

For each estimated model, tests for heteroskedasticity, serial correlation of residuals, and Pesaran's CD test for cross-sectional dependence were conducted. Panel stationarity was examined using the Fisher-ADF approach at the country level, with the note that the time dimension is short and that the results therefore have limited statistical power.

Descriptive Statistics and Correlations

The descriptive indicators for 2012-2020 confirm considerable heterogeneity among EU Member States. Public debt ranges from 8.2% to 206.3% of GDP, while the standard VAT rate ranges from 15% to 27%. The table uses all available observations for each variable within the common 2012-2020 window; accordingly, the number of observations is 243 for most variables and 235 for the long-term interest rate. Regression samples are smaller when one-year lags and complete-case requirements are imposed.

Table 2 Descriptive Statistics of the Variables, 2012-2020

Varijable	N	Mean	Std. dev.	Min	Median	Max
debt	243	69.58	38.88	8.20	62.10	206.30
budg_bal	243	-2.22	3.06	-14.60	-2.00	4.10
gdp_g	243	1.61	3.65	-11.30	2.00	24.40
inf	243	1.44	1.38	-1.60	1.30	5.80
int	235	2.17	2.43	-0.51	1.50	22.50
vat_rate	243	21.52	2.43	15.00	21.00	27.00
vat_rev	243	13.97	2.83	6.60	13.83	22.50

Source: authors' calculations

The 2012–2020 correlation matrix shows that the strongest positive pairwise relationship is between the statutory VAT rate and broad indirect-tax revenues (0.603), followed by the relationship between the budget balance and real GDP growth (0.590). Public debt is negatively correlated with the budget balance (-0.427) and real GDP growth (-0.309), while it is positively correlated with the long-term interest rate (0.377). These coefficients describe pairwise comovement only and should not be interpreted as evidence that one variable causes another.

The negative debt-growth correlation is consistent with the possibility that highly indebted economies may face weaker growth, but it is equally compatible with reverse causality and common shocks. Likewise, the positive debt and interest-rate correlation is consistent with higher financing pressure in more indebted economies without establishing a structural causal channel. The positive VAT-rate revenue correlation indicates that statutory rates and indirect-tax revenue mobilisation move together across the sample, while substantial unexplained variation remains because the revenue indicator also reflects the tax base, consumption, inflation, compliance, and non-VAT indirect taxes.

Inflation is positively correlated with long-term interest rates (0.231), while most remaining pairwise correlations are modest. The correlation matrix therefore provides a descriptive map of the data rather than a basis for causal inference; the panel models below control for persistent country heterogeneity and common year shocks and are interpreted as conditional relationships.

Table 3 Correlation Matrix of Variables, 2012-2020

variable	debt	budg_bal	gdp_g	inf	int	vat_rate	vat_rev
debt	1.0						
budg_bal	-0.427	1.0					
gdp_g	-0.309	0.590	1.0				
inf	-0.205	-0.175	-0.223	1.0			
int	0.377	-0.375	-0.140	0.231	1.0		
vat_rate	0.213	-0.098	-0.043	-0.056	0.178	1.0	
vat_rev	0.199	0.015	-0.177	-0.099	0.114	0.603	1.0

Source: authors' calculations.

Panel model results

Table 4 presents the estimated two-way fixed-effects models. Country fixed effects absorb persistent institutional differences, and year effects capture shocks common to EU Member States. Country-clustered standard errors are reported in parentheses. The preferred revenue and VAT-rate specifications use one-year lags of debt and the budget balance to reduce, but not eliminate, simultaneity. Table 5 reports Driscoll-Kraay sensitivity estimates, because the time dimension is short, these results are treated as robustness evidence rather than a definitive correction.

Table 4 Two-Way Fixed-Effects Models, 2012-2020

Variable	M1: VAT rate (lagged fiscal variables)	M2: Indirect-tax revenue (lagged fiscal variables)	M3: Real GDP growth	M4: Public debt
L.debt	0.011*	0.042***	0.082**	
	(0.006)	(0.013)	(0.035)	
L.budg_bal	0.055	0.028		
	(0.048)	(0.038)		
budg_bal			0.379**	-1.217*
			(0.151)	(0.685)
vat_rate		0.375**		
		(0.171)		
gdp_g	-0.029*	-0.019		-0.293
	(0.016)	(0.027)		(0.210)
vat_rev			-0.654	5.371*
			(0.689)	(3.032)
inf	0.084	0.105*	-0.045	-0.951
	(0.075)	(0.054)	(0.264)	(0.781)
int	-0.120	0.007	0.039	-0.920
	(0.104)	(0.071)	(0.180)	(0.644)
N / countries / adj. R^2	209 / 27 / 0.950	209 / 27 / 0.973	209 / 27 / 0.720	235 / 27 / 0.976

Country-clustered standard errors are reported in parentheses. All models include country and year fixed effects. *** p<0.01; ** p<0.05; * p<0.10. Significance levels for the country-clustered estimates are evaluated using a t reference distribution with 26 degrees of freedom (27 country clusters).
Source: authors' calculations

Table 5 Driscoll-Kraay Sensitivity Estimates

Variable	M1: VAT rate (lagged fiscal variables)	M2: Indirect-tax revenue (lagged fiscal variables)	M3: Real GDP growth	M4: Public debt
L.debt	0.011***	0.042***	0.082	
	(0.004)	(0.003)	(0.069)	
L.budg_bal	0.055***	0.028		
	(0.010)	(0.019)		
budg_bal			0.379***	-1.217***
			(0.137)	(0.297)
vat_rate		0.375***		
		(0.072)		
gdp_g	-0.029**	-0.019		-0.293
	(0.011)	(0.028)		(0.269)
vat_rev			-0.654	5.371***
			(0.475)	(0.653)
inf	0.084	0.105***	-0.045	-0.951**
	(0.105)	(0.028)	(0.210)	(0.438)
int	-0.120***	0.007	0.039	-0.920**
	(0.038)	(0.038)	(0.263)	(0.468)
N / countries	209 / 27	209 / 27	209 / 27	235 / 27

Notes: Driscoll-Kraay standard errors with two lags are in parentheses. The short time dimension ($T \leq 9$) limits asymptotic reliability; these estimates are sensitivity checks. *** $p<0.01$; ** $p<0.05$; * $p<0.10$.

Source: authors' calculations

In the preferred VAT-rate specification, lagged debt has a positive coefficient of 0.011 and is significant at the 10% level with country-clustered errors. Lagged budget balance and inflation are not statistically significant. Real GDP growth has a small negative coefficient that is also significant only at the 10% level. The slow-moving nature of statutory VAT rates and the absence of a strong identification strategy preclude a causal policy interpretation.

The preferred indirect-tax revenue model provides the most stable result. Lagged public debt has a positive coefficient of 0.042 ($p = 0.004$ under the 27-cluster t reference distribution), while the statutory VAT rate is also positive and statistically significant (0.375; $p = 0.037$). Inflation is positive (0.105) but only borderline significant ($p = 0.060$) under country-clustered inference. Lagged budget balance, real GDP growth, and the long-term interest rate are not statistically significant. In economic terms, a 10-percentage-point increase in lagged public debt is associated with approximately 0.42 percentage points of GDP higher broad indirect-tax revenue, while a one-percentage-point higher standard VAT rate is associated with about 0.375 percentage points of GDP

higher revenue, ceteris paribus, and these magnitudes remain associational rather than causal. Thus, the revised estimates support systematic comovement between debt and indirect-tax revenues, but not the claim that a larger current deficit causes a government to increase VAT.

In the growth specification, a better budget balance is positively associated with real GDP growth (0.379; p = 0.018 under country-clustered inference). Lagged debt has a positive coefficient in the two-way FE estimate, but this coefficient is not robust to Driscoll-Kraay standard errors. The long-term interest-rate coefficient is also not significant after year effects are included. In the static debt model, a better budget balance is associated with lower debt at the 10% level. Broad indirect-tax revenues also have a positive coefficient (5.371) that is marginally significant at the 10% level, while GDP growth, inflation, and the long-term interest rate are not statistically significant with country-clustered errors.

Table 6 Restricted-Instrument Difference - GMM Sensitivity Models

Variable / diagnostic	Debt model	Indirect-tax revenue model
Lagged dependent variable	0.929	-0.091
	(1.169)	(0.523)
budg_bal	-1.159	0.294
	(3.555)	(0.192)
gdp_g	-0.545	-0.015
	(2.924)	(0.137)
vat_rev / debt	-5.198	0.136
	(17.779)	(0.085)
vat_rate		-1.032
		(1.479)
Inflation	0.356	0.217*
	(1.911)	(0.129)
Int	-0.275	0.029
	(1.802)	(0.178)
N / countries	156 / 26	156 / 26
Instruments	7	8
AR(1) p-value	0.027	0.983
AR(2) / Sargan p-value	0.074 / 0.069	0.633 / 0.593

Notes: One-step first-difference IV-GMM with a collapsed, restricted instrument set. Cluster-robust standard errors are in parentheses. The debt model has the expected first-order serial correlation and does not reject AR(2) at 5%, but AR(2) and Sargan diagnostics are borderline at 10%. The revenue model does not display the expected significant AR(1), so it is not treated as confirmatory evidence.

Source: authors' calculations

Diagnostic Tests. The estimation prioritises two-way fixed effects because the purpose is to identify within-country relationships while controlling for common year shocks. This choice does not solve endogeneity. Lagged fiscal regressors reduce contemporaneous feedback, and the restricted-instrument difference-GMM estimates are reported only as sensitivity evidence rather than as definitive causal estimates.

Country clustering addresses heteroskedasticity and serial dependence within Member States. Driscoll-Kraay estimates were therefore added as a sensitivity check for cross-sectional dependence. The positive lagged-debt and VAT-rate coefficients remain statistically significant under both covariance estimators. Inflation is only marginally significant under country-clustered inference but becomes more strongly significant under Driscoll-Kraay inference. Several other coefficients change significance, confirming that inference is sensitive to the treatment of common shocks. Because these changes in significance depend on the covariance estimator and the time dimension is very short, they are not treated as independent confirmatory findings.

Debt is strongly persistent, which motivated a restricted-instrument difference-GMM sensitivity model. In the debt equation, the AR(1) test rejects ($p=0.027$), while AR(2) does not reject at 5% ($p=0.074$); the Sargan p-value is 0.069. These borderline diagnostics and the imprecise coefficients require caution. The revenue GMM model does not show the expected significant AR(1), so it is not relied upon for substantive conclusions.

Study limitations and scope of inference. Three limitations delimit inference. First, the common revenue panel ends in 2020, so the energy shock, the war in Ukraine, and subsequent monetary tightening are analysed institutionally and descriptively rather than econometrically. Second, the preferred fixed-effects results remain associational; lagged regressors and sensitivity GMM do not provide a fully exogenous identification strategy. Third, the revenue series measures broad indirect-tax revenues, not pure VAT receipts. Finally, Driscoll-Kraay and dynamic-panel inference is constrained by the short time dimension.

4. DISCUSSION

The findings of this paper are consistent with the broader theoretical and empirical literature on fiscal rules, public debt, and fiscal sustainability in the European Union. In line with Musgrave's classical functions of public finance and Oates's theory of fiscal federalism, the results confirm that fiscal policy in the EU cannot be assessed only through numerical limits, but must also be understood through

the allocation of fiscal responsibilities between the national and supranational levels. Since monetary policy is centralised in the euro area, while fiscal policy remains largely national, the effectiveness of fiscal rules depends not only on the deficit and debt thresholds, but also on the institutional capacity of Member States to conduct credible and growth-supporting fiscal policy.

The results also complement the debate on the Maastricht criteria and the Stability and Growth Pact. While Buti and Giudice (2002) emphasise the disciplinary function of fiscal rules, the revised estimates suggest that such rules remain useful credibility anchors but do not by themselves describe the mechanisms through which fiscal adjustment occurs. The most stable empirical finding is a positive conditional relationship between lagged public debt and broad indirect-tax revenues. Other relationships are more sensitive to specification and covariance estimation. This pattern supports a dynamic and country-specific assessment of fiscal sustainability rather than a mechanical interpretation of the 3% and 60% reference values.

The paper's results are also closely related to the empirical debate initiated by Reinhart and Rogoff (2010) and later challenged by Herndon, Ash, and Pollin (2014). The negative relationship between public debt and growth found in the correlation analysis is consistent with the view that high debt may be associated with weaker economic performance. However, the broader interpretation of the results supports the criticism that there is no universal debt threshold applicable to all countries. The sustainability of debt depends on country-specific factors, including growth potential, institutional quality, borrowing costs, the structure of public expenditure, and the capacity to generate stable public revenues.

In this respect, Blanchard's (2019) emphasis on the relationship between the interest rate and economic growth remains important for interpreting debt sustainability. In the revised two-way fixed-effects estimates, however, the long-term interest-rate coefficient is not statistically significant in the preferred indirect-tax revenue model or in the GDP-growth model with country-clustered standard errors. Financing conditions therefore remain theoretically and institutionally important, but this paper does not claim a robust direct interest-rate effect from the baseline econometric specification.

The results concerning indirect taxation can also be linked to the literature on fiscal consolidation. The positive and robust relationship between lagged public debt and broad indirect-tax revenues is consistent with systematic comovement between fiscal pressure and revenue mobilisation, but it does not demonstrate that governments deliberately raise VAT in response to debt. The statutory VAT rate is positive and statistically significant at the 5% level in the preferred

country-clustered specification, while inflation is positive but only borderline significant at the 10% level. Lagged budget balance, real GDP growth, and the long-term interest rate are not statistically significant. Driscoll-Kraay sensitivity estimates strengthen the apparent significance of some coefficients, but because T is very short these changes are not treated as independent confirmation. These findings should therefore be read together with the wider literature emphasising the composition of adjustment, the tax base, compliance, expenditure quality, and protection of productive investment.

Finally, the 2024 reform of the EU fiscal framework can be interpreted as an institutional response to several weaknesses discussed in the literature and highlighted by the heterogeneity observed in this study. The introduction of medium-term fiscal-structural plans and the net expenditure path reflects a shift away from a uniform pace of adjustment toward a more country-specific and sustainability-oriented framework. This is consistent with the paper's broader argument that numerical anchors are most credible when combined with growth, investment, institutional capacity, and a feasible medium-term debt path.

5. CONCLUSIONS

The paper has shown that the sustainability of the European Union's fiscal convergence criteria requires a contemporary interpretation that links fiscal discipline, economic growth, institutional quality, and the structure of public expenditure. The criteria of a 3% deficit and 60% public debt remain important anchors of economic policy, but they are not sufficient in themselves for assessing fiscal sustainability. The latest Eurostat data for 2025 show that public debt in the EU and the euro area remains significantly above the reference values, while a large number of Member States still have deficits above or close to the permitted threshold.

The preferred estimates indicate a positive and statistically significant relationship between lagged public debt and broad indirect-tax revenues. The statutory VAT rate is also positively and statistically significantly associated with the revenue indicator, while inflation has a positive coefficient with borderline statistical significance under country-clustered inference. The lagged budget balance, real GDP growth, and the long-term interest rate are not statistically significant in the preferred revenue specification. These findings are interpreted as conditional relationships rather than evidence that higher debt or deficits cause governments to increase VAT or other indirect taxes. The restricted-instrument GMM results are reported only as sensitivity evidence because their diagnostics do not support stronger causal claims.

Taken together with the theoretical literature and the EU institutional framework, the results indicate that fiscal consolidation should be designed carefully. A strategy relying predominantly on higher indirect taxation may strengthen revenues in the short run but can also affect consumption and the distribution of the tax burden. Sustainable adjustment therefore requires attention to the tax base and collection efficiency, the quality of expenditure, credible medium-term planning, and the protection of productive investment rather than reliance on any single revenue instrument.

The 2024 reform of the European Union's fiscal framework represents an important step toward a more realistic and differentiated system of economic governance. The introduction of medium-term fiscal-structural plans and a net expenditure path may contribute to a more responsible national approach to fiscal policy and a more gradual reduction of debt. However, the success of the reform will depend on its consistent implementation, the quality of national institutions, and the ability to ensure that fiscal discipline does not come at the expense of the investments needed for Europe's green, digital, and defence transformation.

Finally, the future of the European Union's fiscal policy will depend on its ability to strike a balance between discipline and development. Fiscal rules must prevent unsustainable borrowing, but at the same time they must leave room for investments that increase future GDP. Only such an approach can ensure the stability of public finances, the resilience of the monetary union, and long-term economic growth.

Conflict of interests

The authors declare there is no conflict of interest.

REFERENCES

Alesina, A., & Perotti, R. (1997). Fiscal adjustments in OECD countries: Composition and macroeconomic effects. *IMF Economic Review, 44*(2), 210-248. https://doi.org/10.5089/9781451960433.001

Alesina, A., Barbiero, O., Favero, C., Giavazzi, F., & Paradisi, M. (2017). *The effects of fiscal consolidations: Theory and evidence* CEPR Discussion Paper No. 12016. CEPR Press, Paris & London. https://cepr.org/publications/dp12016

Alesina, A., Favero, C., & Giavazzi, F. (2018). *What do we know about the effects of austerity?* NBER Working Paper No. 24246. https://www.nber.org/papers/w24246

Blanchard, O. (2019). Public debt and low interest rates. *American Economic Review, 109*(4), 1197–1229. https://www.aeaweb.org/articles?id=10.1257/aer.109.4.1197

Buti, M., & Giudice, G. (2002). Maastricht's fiscal rules at ten: An assessment. *JCMS: Journal of Common Market Studies, 40*(5), 823–848. https://doi.org/10.1111/1468-5965.00399

Council of the European Union. (2024a). *Economic governance review: Council adopts reform of fiscal rules*. https://www.consilium.europa.eu/en/press/press-releases/2024/04/29/economic-governance-review-council-adopts-reform-of-fiscal-rules/

Council of the European Union. (2024b). *Stability and Growth Pact: Council launches excessive deficit procedures against seven Member States*. https://www.consilium.europa.eu/en/press/press-releases/2024/07/26/stability-and-growth-pact-council-launches-excessive-deficit-procedures-against-seven-member-states/

European Commission. (2024). *New economic governance framework*. https://economy-finance.ec.europa.eu/economic-governance-framework/what-economic-governance-framework/evolution-eu-economic-governance/new-economic-governance-framework_cs

European Commission. (2025a). *Fiscal governance database*. Directorate-General for Economic and Financial Affairs. https://economy-finance.ec.europa.eu/economic-research-and-databases/economic-databases/fiscal-governance-database_en

European Commission. (2025b). *VAT rates applied in the Member States of the European Union*. Directorate-General for Taxation and Customs Union. https://taxation-customs.ec.europa.eu/taxation/vat/vat-directive/vat-rates_en

European Commission. (2026a). *Convergence criteria for joining*. https://economy-finance.ec.europa.eu/euro/enlargement-euro-area/convergence-criteria-joining_en

European Commission. (2026b). *Legal basis of the Stability and Growth Pact*. https://economy-finance.ec.europa.eu/economic-governance-framework/stability-and-growth-pact/legal-basis-stability-and-growth-pact_en

European Commission. (2026c). *Fiscal Governance Database*. https://economy-finance.ec.europa.eu/economic-research-and-databases/economic-databases/fiscal-governance-database_en

European Fiscal Board. (2024). *Annual report of the European Fiscal Board*. https://commission.europa.eu/publications/2024-annual-report-european-fiscal-board_en

European Parliament and Council. (2024). *Regulation (EU) 2024/1263 on the effective coordination of economic policies and on multilateral budgetary surveillance. Official Journal of the European Union*. https://eur-lex.europa.eu/eli/reg/2024/1263/oj/eng

Eurostat. (2025). *Government finance statistics database*. European Commission. https://ec.europa.eu/eurostat

Eurostat. (2026). *Government deficit and debt statistics – First notification for 2025*. European Commission. https://ec.europa.eu/eurostat/web/products-euro-indicators/w/2-22042026-ap

Feldstein, M. (2005). The euro and the Stability Pact. *Journal of Policy Modeling, 27*(4), 421-426. https://doi.org/10.1016/j.jpolmod.2005.04.007

Herndon, T., Ash, M., & Pollin, R. (2014). Does high public debt consistently stifle economic growth? A critique of Reinhart and Rogoff. *Cambridge Journal of Economics, 38*(2), 257-279. https://academic.oup.com/cje/article/38/2/257/1714018

International Monetary Fund. (2025). *Fiscal Monitor: Fiscal policy under uncertainty*. https://www.imf.org/en/Publications/FM/Issues/2025/04/23/fiscal-monitor-april-2025

Musgrave, R. A. (1973). *Public Finance in Theory and Practice*. McGraw-Hill.

Oates, W. E. (2008). On the evolution of fiscal federalism: Theory and institutions. National tax journal, 61(2), 313-334. https://doi.org/10.17310/ntj.2008.2.08

Popović, G., & Erić, O. (2021). *Evropska ekonomska integracija*. Banja Luka: Univerzitet u Banjoj Luci, Ekonomski fakultet.

Reinhart, C. M., & Rogoff, K. S. (2010). Growth in a time of debt. *American Economic Review, 100*(2), 573–578. https://www.aeaweb.org/articles?id=10.1257/aer.100.2.573

Stiglitz, J. E. (2016). *The euro: How a common currency threatens the future of Europe*. W. W. Norton & Company.

Your Europe. (2026). *VAT rules and rates*. https://europa.eu/youreurope/business/taxation/vat/vat-rules-rates/index_en.htm

ОДРЖИВОСТ ФИСКАЛНИХ КРИТЕРИЈУМА КОНВЕРГЕНЦИЈЕ ЕВРОПСКЕ УНИЈЕ

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САЖЕТАК

Рад анализира одрживост фискалних критеријума конвергенције Европске уније и однос између фискалних услова и прихода од индиректних пореза. Емпиријска анализа заснива се на небалансираном панелу 27 држава чланица ЕУ за период 2012–2020, као најдужем заједничком периоду расположивости података о јавном дугу, буџетском салду, реалном расту БДП-а, инфлацији, дугорочним каматним стопама, стандардној стопи ПДВ-а и широком показатељу прихода од индиректних пореза. Процијењени су двосмјерни модели са фиксним ефектима, уз стандардне грешке груписане по државама и Дрискол-Крај провјере осјетљивости.

У изабраном моделу прихода, јавни дуг са једним временским помаком позитивно је и статистички значајно повезан са приходима од индиректних пореза, а стандардна стопа ПДВ-а такође има позитиван и статистички

значајан коефицијент. Инфлација је позитивна, али је њена статистичка значајност гранична на нивоу од 10% када се користи инференција са стандардним грешкама груписаним по државама. Буџетски салдо са помаком, реални раст БДП-а и дугорочна каматна стопа нису статистички значајни у том моделу. Резултати се тумаче као условне повезаности, а не као доказ узрочног одговора фискалне политике. Оцјене добијене генерализованим методом момената у првим диференцама, уз ограничен скуп инструмената, приказане су искључиво као показатељ осјетљивости резултата, јер кратка временска димензија и гранични резултати дијагностичких тестова ограничавају статистичко закључивање.

Посљедице пандемије након 2020. године, енергетски и геополитички шокови те пооштравање монетарне политике анализирају се дескриптивно и институционално, а не као ефекти идентификовани основним панел моделом. Налази подржавају задржавање референтних вриједности из Мастрихта као фискалних сидара, уз њихово допуњавање путањама прилагођавања дуга специфичним за сваку земљу, кредибилним средњорочним планирањем, инвестицијама које подстичу раст и снажнијим институционалним капацитетом.

Кључне ријечи: *фискални критеријуми конвергенције; јавни дуг; буџетски дефицит; ПДВ; фискална одрживост; Европска унија; панел економетријска анализа.*