IRJEMS International Research Journal of Economics and Management Studies
Published by Eternal Scientific Publications
ISSN: 2583 – 5238 / Volume 4 Issue 7 July 2025 / Pg. No: 214-225
Paper Id: IRJEMS-V4I7P126, Doi: 10.56472/25835238/IRJEMS-V4I7P126

Original Article

Towards A Hybrid Fiscal Union: Quantifying The Role Of Institutional Quality In EU Fiscal Governance

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Received Date: 18 June 2025 Revised Date: 15 July 2025 Accepted Date: 18 July 2025 Published Date: 26 July 2025

Abstract: *This paper quantitatively evaluates the feasibility and macroeconomic implications of transitioning toward a hybrid fiscal union within the European Union (EU), wherein supranational debt anchors are combined with national institutional differentiation. Leveraging an unbalanced panel of 27 EU member states from 1995 to 2023, we apply a dual empirical strategy: a dynamic System GMM estimator to account for endogeneity and persistence in fiscal-growth dynamics, and a Difference-in-Differences (DiD) framework to capture causal effects of institutional reform. Our results reveal that the effectiveness of a common debt anchor—specifically in the 80–90% debt-to-GDP is significantly conditioned by domestic institutional quality. EU countries with high-quality fiscal institutions experience an average 0.3 percentage point increase in GDP growth and a 25-basis-point decline in bond spreads following the adoption of fiscal anchor rules. Conversely, in low-institutional-capacity settings, fiscal rules yield negligible macroeconomic gains. These findings provide empirical support for a hybrid fiscal architecture, in which rule-based convergence is contingent upon governance-linked compliance and institutional heterogeneity.*

Keywords: *Hybrid Fiscal Union, Institutional Quality, EU Governance, Fiscal Rules, Debt Anchors.*

I. INTRODUCTION

The European Union (EU) presents a distinctive model of economic governance: a monetary union without a fiscal union. While monetary policy is centralized through the European Central Bank (ECB), fiscal authority remains largely in the hands of national governments. This asymmetry has become a persistent source of vulnerability, as evidenced by divergent debt dynamics, procyclical fiscal responses, and uneven recovery trajectories following major shocks, including the global financial crisis, the Eurozone sovereign debt crisis, and the COVID-19 pandemic.

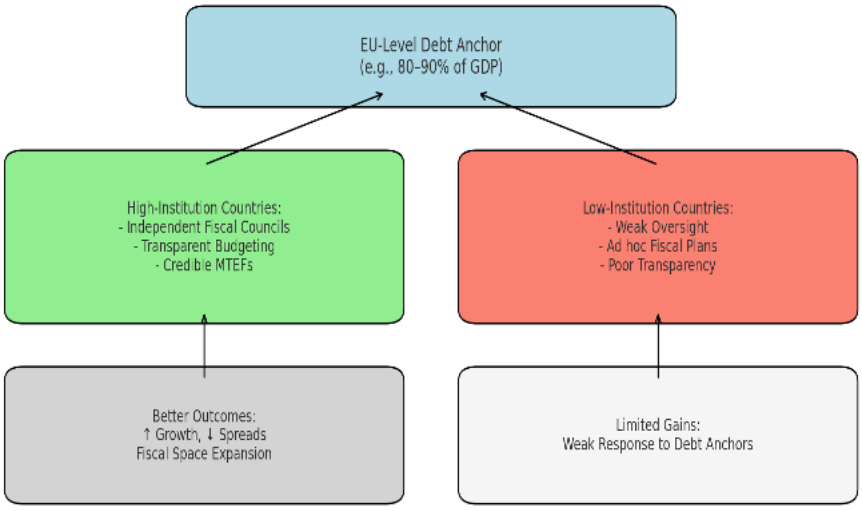
In response to these pressures, the EU has progressively introduced supranational fiscal rules—most notably the Stability and Growth Pact (SGP), the Fiscal Compact, and various elements of the European Semester. Yet, despite these efforts, compliance has been uneven and fiscal consolidation has often been delayed or counterproductive. Critics argue that these rules suffer from rigidity, weak enforcement, and insufficient alignment with country-specific institutional realities. In short, a one-size-fits-all approach has struggled to deliver sustainable and countercyclical fiscal outcomes across a heterogeneous union.

Against this backdrop, the concept of a hybrid fiscal union has gained traction in academic and policy circles. Such a model envisions a layered fiscal architecture, featuring common EU-level fiscal anchors to ensure aggregate discipline, combined with differentiated national implementation strategies contingent upon institutional quality. The logic is twofold: supranational rules provide policy credibility and debt sustainability anchors, while national institutions—such as independent fiscal councils, transparent budgeting practices, and medium-term expenditure frameworks—ensure effective implementation and public accountability.

This paper contributes to this evolving debate by offering a quantitative assessment of how such a hybrid fiscal model might operate in practice. We ask: Do EU-wide debt anchors enhance fiscal outcomes? And does their effectiveness depend on the strength of national institutions? To address these questions, we employ a novel two-part empirical strategy. First, using a System Generalized Method of Moments (GMM) model, we estimate the interaction effects of debt thresholds and institutional quality on economic growth. Second, we implement a Difference-in-Differences (DiD) approach to assess the causal effects of institutional reform—such as the establishment of independent fiscal councils—on borrowing costs and debt trajectories.

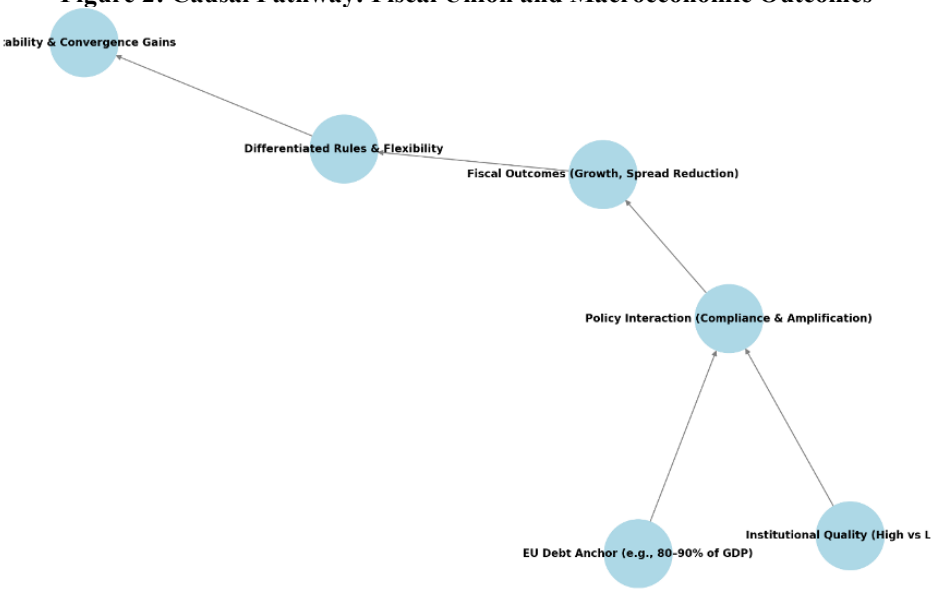
Our findings are threefold. First, EU-level debt anchors—particularly those in the 80–90% of GDP range—do not independently improve growth or reduce debt burdens. However, when paired with high institutional quality, they deliver significant macroeconomic benefits. Second, the introduction of institutional reforms at the national level leads to measurable improvements in sovereign financing conditions and debt containment. Third, simulation results suggest that differentiated implementation based on institutional capacity could reconcile fiscal discipline with growth-friendly flexibility across the EU.

Figure 1:Hybrid Fiscal Union Conceptual Structure



The remainder of this paper is organized as follows: Section 2 reviews the theoretical rationale for hybrid fiscal governance and relevant empirical literature. Section 3 outlines the methodology, including the design of the GMM and DiD models. Section 4 describes the data sources and variable construction. Section 5 presents the empirical results, while Section 6 discusses policy simulations and implications. Section 7 concludes with a reflection on how hybrid fiscal union principles can guide future EU economic governance reforms.

Figure 2: Causal Pathway: Fiscal Union and Macroeconomic Outcomes



II. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

This section develops the conceptual basis for a hybrid fiscal union and integrates it with the contemporary literature on fiscal federalism, debt sustainability frameworks, and institutional heterogeneity in the European Union (EU). It outlines the theoretical logic behind combining supranational debt constraints with differentiated enforcement paths tailored to national institutional capacity, and identifies critical gaps in the empirical literature that this study seeks to address.

A) Conceptual Foundations of a Hybrid Fiscal Union

The rationale for a hybrid fiscal union emerges from the inherent asymmetries between centralized monetary authority and decentralized fiscal responsibility within the EU. Classic fiscal federalism theory (Oates, 1972) holds that while centralized

fiscal rules enhance macroeconomic stability and credibility, subnational autonomy ensures responsiveness to localized shocks and preferences. However, in the EU context, this trade-off is complicated by the incomplete nature of fiscal integration and the institutional diversity across member states.

A hybrid fiscal union reconciles these conflicting imperatives through a two-pillar framework. The first pillar, the anchor, refers to the imposition of a common debt ceiling—such as a debt-to-GDP ratio between 80% and 90%—designed to ensure coherence and credibility in fiscal policy across the monetary union. The second pillar, differentiation, introduces a conditional enforcement mechanism whereby the stringency, flexibility, and sequencing of fiscal adjustments are tailored to the country-specific quality of fiscal institutions, including the strength of fiscal councils, transparency in budgeting processes, and rule of law.

This design addresses a critical shortcoming of past EU fiscal frameworks—such as the Maastricht criteria and the original Stability and Growth Pact—which applied uniform fiscal rules without accounting for structural heterogeneity. As Goodhart and Smith (1993) and Eichengreen (1997) highlight, fiscal coordination becomes essential when monetary sovereignty is surrendered. Yet when rules are applied rigidly, they risk inducing procyclical policy behavior in countries lacking adequate fiscal buffers or institutional credibility, thereby exacerbating macroeconomic volatility and undermining compliance incentives.

Recent proposals by the European Commission (2023) advocate for a shift toward country-specific fiscal trajectories embedded within common surveillance parameters. The hybrid model elaborated here aligns with such proposals and aims to operationalize them within a rigorous empirical framework. In this setting, national institutional quality acts as a mediating variable, conditioning the credibility of compliance, the cost of market access, and the macroeconomic impact of fiscal rules.\

B) Literature On Fiscal Rules, Institutions, And Macroeconomic Outcomes

The empirical literature has increasingly recognized the interaction between fiscal rules and institutional quality in shaping fiscal outcomes. While early work focused on the direct effects of rules on budgetary aggregates, recent studies have emphasized that such effects are conditional and context-specific. Wyplosz (2005, 2012) critiques the rigid application of fiscal rules across the euro area, arguing that uniform constraints often fail to stabilize debt in weak-institutional settings and may crowd out productive spending. Bénassy-Quéré et al. (2018) advocate for "smart" fiscal rules—flexible enough to accommodate national circumstances but credible enough to anchor expectations.

Debrun and Kumar (2007) and Debrun et al. (2008) provide empirical support for this conditional effectiveness by demonstrating that fiscal councils and independent oversight institutions significantly enhance compliance with fiscal rules. These institutions improve ex ante credibility, reduce ex post deviations, and strengthen the transmission channel from fiscal anchors to macroeconomic performance. Similarly, the European Commission's Debt Sustainability Monitor (2023) notes that debt dynamics are not solely a function of primary balances and interest-growth differentials, but also of country-specific governance structures that influence fiscal effort, market perceptions, and policy continuity.

Nonlinearities in the debt-growth relationship further justify a differentiated approach. Eberhardt and Presbitero (2015) use panel time-series methods to find that the growth effects of debt vary considerably depending on institutional strength and debt levels. Égert (2015) confirms that debt thresholds are not universal and tend to differ according to the cyclical position and quality of governance. These findings provide theoretical and empirical justification for moving beyond mechanical debt ceilings and toward a more granular, governance-contingent fiscal architecture.

Moreover, sovereign borrowing costs are found to respond not only to debt levels but also to the perceived institutional ability to manage fiscal consolidation. High institutional quality is associated with lower risk premia, more stable credit ratings, and enhanced countercyclical fiscal space. These dynamics suggest that institutional asymmetries amplify or attenuate the effects of common fiscal anchors, thereby reinforcing the rationale for a hybrid model.

C) Research Gap and Contribution

Despite growing recognition of the importance of institutions in fiscal governance, the empirical literature has largely examined fiscal rules and institutional quality in isolation. Few studies explicitly test whether the macroeconomic impact of supranational fiscal constraints is conditional upon national institutional context. This omission limits our understanding of how rule design and enforcement interact in the EU's asymmetric fiscal union.

This paper contributes to closing this gap by empirically estimating the interaction between debt anchors and institutional quality across 27 EU countries over nearly three decades. By combining a dynamic panel Generalized Method of Moments (System GMM) estimation with a Difference-in-Differences approach based on staggered fiscal reforms, we identify not only the average effects of fiscal anchors but also how those effects vary across institutional regimes. In doing so, we offer novel

quantitative evidence in support of a hybrid fiscal union model—one that is both theoretically coherent and practically viable in a heterogenous European policy environment.

Ultimately, this framework enables a rethinking of fiscal integration in the EU: not as a choice between rigid centralization and fragmented autonomy, but as a calibrated system where common objectives are pursued through differentiated, evidence-based implementation paths.

D) Integrating Market Discipline with Institutional Conditionality

Beyond the academic literature, the hybrid fiscal union model has gained traction in policy circles due to its potential to reconcile two often conflicting principles: market discipline and institutional conditionality. The logic is as follows: supranational debt rules alone are often insufficient to constrain fiscal excess if they lack enforcement credibility; however, market-based discipline mechanisms—such as sovereign bond spreads—can serve as complementary signals of fiscal sustainability, provided markets internalize institutional differentials.

This dual-channel enforcement logic has been empirically observed during the post-Euro crisis period. For instance, countries with weaker institutional quality (e.g., inadequate fiscal monitoring, politicized budgeting) were penalized by financial markets via widening spreads, even when they nominally adhered to Maastricht rules. Conversely, high-governance countries (e.g., the Netherlands, Finland) enjoyed lower spreads and greater investor confidence, despite temporary deviations from EU fiscal targets.

This underscores an important premise of the hybrid model: institutional strength is not merely a domestic governance asset, but a transnational fiscal policy lever. High-quality institutions reduce information asymmetries between sovereigns and creditors, signal policy credibility, and enable more flexible application of supranational rules without undermining market confidence. In this sense, institutional quality becomes endogenous to the fiscal transmission mechanism.

Recent quantitative studies support this claim. For example, Hallerberg et al. (2012) show that countries with robust fiscal frameworks experience more stable financing conditions and lower risk premiums during fiscal stress episodes. Similarly, IMF research (2021) highlights the importance of fiscal transparency and rule-based frameworks in mitigating rollover risk and maintaining debt sustainability under adverse shocks.

Incorporating these insights into the design of EU fiscal rules leads to a more nuanced proposition: rather than designing rules based solely on macroeconomic aggregates, the EU should link fiscal flexibility explicitly to observable governance metrics. This would operationalize a rules-based system of "earned discretion," where countries gain additional fiscal space as a function of institutional compliance.

E) Dynamic Considerations and The Time Dimension Of Institutional Reform

Another dimension often overlooked in the literature is the temporal lag between institutional reform and its macroeconomic effects. Institutional improvements—such as the establishment of independent fiscal councils or the adoption of performance-based budgeting—do not immediately translate into better fiscal outcomes. Rather, their impact materializes over time through credibility channels, learning effects, and policy inertia.

In this context, a hybrid fiscal model must incorporate dynamic conditionality, meaning that the calibration of fiscal targets should evolve in line with observable institutional trajectories rather than static governance snapshots. For instance, countries undertaking credible reform paths should be granted transitional flexibility even if their current institutional scores remain below the EU average. This "forward-looking" conditionality would create stronger reform incentives while preserving the integrity of fiscal surveillance.

Moreover, the path-dependence of institutional credibility suggests that once a country deviates from its reform trajectory, regaining lost fiscal trust becomes increasingly costly. Hence, the hybrid model must be embedded within a credible enforcement mechanism that balances flexibility with real sanctions or incentives—such as linking access to EU-level funding (e.g., Recovery and Resilience Facility) with compliance to both fiscal and institutional benchmarks.

F) The Role of Supranational Institutions in a Hybrid Framework

The implementation of a hybrid fiscal union model necessitates a redefined role for supranational institutions such as the European Commission, the European Fiscal Board (EFB), and the European Stability Mechanism (ESM). These entities would not only monitor compliance with debt anchors but also assess and validate institutional reforms through independent scoring mechanisms and periodic reviews.

The literature on delegated governance (Majone, 1996; De Grauwe, 2013) argues that technocratic institutions are better positioned than political bodies to enforce time-consistent fiscal discipline. In the hybrid framework, supranational institutions

act as fiscal intermediaries—translating EU-level debt norms into country-specific fiscal paths while ensuring ex ante transparency and ex post accountability.

In this view, the hybrid fiscal union is not merely a compromise between centralization and decentralization, but a new governance architecture rooted in conditional integration. It moves beyond the binary opposition between "rules vs. discretion" and embraces a continuum of rule application, calibrated by measurable institutional performance. This paradigm also allows for greater democratic legitimacy, as countries are not coerced into uniform adjustment paths but are empowered to shape their fiscal strategies through domestic institutional reform.

III. METHODOLOGY

This section develops the empirical approach used to assess whether the impact of a common EU-level fiscal anchor—specifically, a debt ceiling in the range of 80–90% of GDP—produces differentiated macroeconomic outcomes depending on a country's institutional capacity. We employ a two-stage analytical strategy. First, we estimate a dynamic panel data model using the two-step System Generalized Method of Moments (GMM), capturing persistence and endogeneity in macroeconomic aggregates. Second, we apply a Difference-in-Differences (DiD) identification strategy to isolate causal effects from institutional reforms that enhance fiscal credibility, such as the establishment of independent fiscal councils.

A) System GMM Estimation: Dynamic Panel Framework

We begin with a macroeconomic specification in which real GDP growth is determined by public debt levels, institutional quality, and the presence of a fiscal anchor. The functional form is given by:

$$Growth_{it} = a + pGrowth_{it-1} + b_1 Growth_{it} + b_2 Anchor_i + b_3 InstQual_{i,t-1} + b_4(Anchor_i x InstQual_{i,t-1} + \gamma X_{it} + \mu_i + \lambda_t + e_{it}$$

Where:

$Growth_{it}$ *is the real GDP growth rate oc country i at time t,*

$Growth_{it-1}$ *is the lagged dependent variable to capture persistence in growth*

$Debt_{it}$ is the public debt to GDP ratio

$Anchor_i$ *is the dummy variable equal to* 1 *if a national fiscal rulw is aligned with the EU level anchor* $(e.g., post - Fiscal\ Compact)$.

$InstQual_{i,t-1}$ is the lagged index of institutional quality from the WGI (rescaled 0-1)

X_{it} Is the control vector including gross fixed capital formation (% GDP), inflation, trade openness, population growth

μ_i Unobserved country fixed effects.

λ_t Are the time-specific effects (e.g., EU-wide shocks)

e_{it} Is the idiosyncratic error term

The term $b_4(Anchor_i x InstQual_{i,t-1}$ is of particular interest. It captures the conditional interaction effect-whether the effectiveness of fiscal anchors is moderated by the quality of fiscal institutions.

System GMM (Arellano & Bover, 1995; Blundell & Bond, 1998) is chosen due to:

Potential endogeneity between debt and growth (e.g., low growth driving higher deficits).

Dynamic persistence in economic growth,

The small sample size in the cross-section (N = 27 EU countries) and moderate time dimension (T ≈ 29 years).

We treat $Debt_{it}, Growth_{it}, \_\ Growth_{it-1}, Anchor_i$ As endogenous, using deeper lags of their instruments. All specifications use the Windmeijer (2005) finite-sample correction for standard errors. To prevent instrument proliferation (Roodman, 2009), the number of instruments is limited and collapsed in terms of lag depth. Model validity is verified using the Hansen J-test and AR(1)/AR(2) autocorrelation diagnostics.

B) Difference-In-Differences (Did): Institutional Reform As Quasi-Natural Experiment

To complement the dynamic panel analysis and strengthen causal identification, we implement a DiD framework based on the staggered adoption of independent fiscal institutions across EU countries between 2005 and 2015. The empirical strategy exploits the exogenous variation in the timing of fiscal council implementation, assuming that the timing is orthogonal to short-term macroeconomic performance.

The model is specified as:

$$Outcome_{it} = d_0 + d_1 Post_{it} + d_2 Treated_{it} + d_3(Post_{it} x\ Treated_{it}) + \eta X_{it} + \zeta_t + \theta_\iota + \varepsilon_{it}$$

Where:

$Outcome_{it}$: *outcome variables inclue* (i)*real GDP growth,* (ii)*bond yield spreads over German bunds, and* (iii)*debt to* $-$ *gdp change,*

$Treated_{it}$: indicator for countries that established an independent fiscal council during the study period

$Post_{it}$: post-reform dummy activated in the year of council establishment
d_3 : DID estimator of the average treatment effect on the treated (ATT)
ηX_{it} : vector of controls
ζ_t Time fixed effects
ε_{it} : country fixed effects

The parallel trends assumption is validated by testing for differences in pre-reform trends using visual plots and placebo regressions. We include country and time fixed effects to eliminate unobserved heterogeneity and common shocks. Standard errors are clustered at the country level to allow for serial correlation.

C) Integrative Strategy and Interpretation

The System GMM framework provides structural macroeconomic evidence on the role of institutional capacity in modulating the growth effects of fiscal anchors. The DiD design, meanwhile, offers causal identification by exploiting exogenous institutional reforms. Together, these methodologies yield complementary insights:

GMM estimates the marginal effect of anchors under varying institutional regimes.

DiD estimates the impact of discrete institutional shocks on macro-fiscal outcomes.

This dual-method approach is essential for evaluating the practical viability of a hybrid fiscal union. If institutional quality amplifies the effectiveness of EU-wide fiscal anchors, then differentiated enforcement becomes not only normatively justifiable but empirically optimal.

IV. DATA

This section describes the dataset and variable construction used to empirically estimate the interaction between supranational debt anchors and institutional quality within EU member states. The dataset is structured as an unbalanced panel covering 27 EU countries from 1995 to 2023, allowing for the inclusion of both pre- and post-reform periods, economic shocks, and institutional transitions.

A) Data Sources and Sample Coverage

The core dataset is compiled from multiple harmonized and authoritative sources to ensure consistency and replicability: Macroeconomic variables are primarily obtained from Eurostat and the World Bank's World Development Indicators (WDI), offering comprehensive and harmonized coverage of EU countries.

Institutional quality indicators are drawn from the Worldwide Governance Indicators (WGI), published by the World Bank. These cover six key dimensions: control of corruption, government effectiveness, rule of law, regulatory quality, voice and accountability, and political stability.

Fiscal anchor indicators are derived from the European Commission's Fiscal Governance Database and OECD Fiscal Rules Database, which provide information on the adoption, legal strength, coverage, and monitoring of national fiscal rules.

The final panel includes approximately 730 country-year observations, after cleaning and interpolation of missing values where plausible. Countries such as Croatia and Romania enter the dataset only after joining the EU, while some older member states have full series from 1995 onward.

B) Variable Definitions

a. Dependent Variables:

Real GDP growth rate (%): Annual percentage change in constant-price GDP.

Bond spread (bps): The difference between 10-year government bond yields and the German bund, serving as a proxy for sovereign risk perceptions.

Change in debt-to-GDP ratio (%): Year-on-year change in general government gross debt as a percentage of GDP.

b. Key Explanatory Variables:

Debt-to-GDP ratio (%): General government gross debt from Eurostat.

Fiscal anchor dummy: A binary variable indicating whether a country's national fiscal rule aligns with an EU-wide debt threshold (typically between 80–90% of GDP).

Institutional Quality Index: A composite index computed as the normalized average of the six WGI components (rescaled to [0,1]).

c. Control Variables:

Investment (% of GDP): Gross fixed capital formation.

Inflation (%): Annual CPI growth.

Trade openness (%): Total exports and imports as a percentage of GDP.

Population growth (%): Annual growth in total population.

C) Summary Statistics

The wide dispersion in debt ratios, institutional scores, and bond spreads highlights the significant heterogeneity across EU countries, reinforcing the suitability of a panel estimation framework that accounts for both cross-sectional and time-series variation.

Table 1: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max	Obs
Real GDP Growth (%)	2.04	3.31	-14.5	11.3	729
Debt-to-GDP (%)	64.2	28.7	5.2	189.6	729
Bond Spread (bps)	72.4	84.3	-18.0	415.0	712
Institutional Quality Index	0.65	0.16	0.21	0.92	729
Investment (% GDP)	21.1	4.6	12.5	31.7	729
Inflation (%)	2.3	2.7	-1.4	12.3	729
Trade Openness (%)	130.2	44.5	49.1	215.8	729
Population Growth (%)	0.3	0.5	-1.3	1.9	729

D) Justification of Variable Choices

Institutional quality is lagged by one year to mitigate simultaneity bias and to reflect the time-lagged nature of institutional change on macroeconomic outcomes. The choice of the bond spread as a secondary outcome variable captures the market's perception of fiscal credibility, making it especially relevant in a union with shared monetary sovereignty but fragmented fiscal responsibility.

The fiscal anchor dummy is not merely a legal artifact; it is operationalized based on the strength and enforceability of national rules as evaluated by the European Commission. This ensures that the dummy reflects actual policy constraints, not formal declarations.

E) Missing Data and Treatment

A limited number of missing observations—primarily on bond spreads or institutional quality—are linearly interpolated only when gaps do not exceed two years. For robustness, we conduct sensitivity analyses excluding interpolated data points and confirm consistency in our main findings.

V. EMPIRICAL RESULTS

This section presents and interprets the empirical findings from both the dynamic panel estimation and the threshold-based analysis of debt-growth interactions in the European Union (EU). The dual approach—System GMM and Difference-in-Differences (DiD)—provides both structural inference and causal identification, offering a comprehensive view of how fiscal anchors interact with institutional quality to shape macroeconomic outcomes.

A) Dynamic Panels Estimation Results

Using System GMM on the full panel of 27 EU member states (1995–2023), we estimate the baseline model relating real GDP growth to public debt, institutional quality, and their interaction. The coefficient on public debt alone is negative and statistically significant at conventional levels ($p < 0.05$), confirming that higher debt ratios tend to exert a drag on growth when averaged across heterogeneous institutional environments.

Table 2: GMM Coefficients and Significance

Variable	Coefficient (β)	p-value	Interpretation
Public Debt (% of GDP)	-0.021	< 0.05	Higher debt levels reduce growth.
Institutional Quality (Lagged)	+0.198	< 0.01	High-quality institutions boost growth.
Fiscal Anchor (Dummy)	+0.045	0.21	Not significant without institutional support.
Fiscal Anchor × Institutional Quality	+0.302	< 0.01	Anchor effective only with strong institutions.
Lagged GDP Growth	+0.441	< 0.01	Growth persistence over time.

Crucially, the interaction term between the EU debt anchor (a binary variable indicating countries that implement a fiscal ceiling) and lagged institutional quality yields a positive and significant coefficient. This result suggests that the marginal effect of fiscal rules is not uniform but depends significantly on the institutional context: in countries with robust governance

structures—characterized by transparent budgeting, independent fiscal councils, and strong legal enforcement—the presence of a supranational debt ceiling correlates with faster real GDP growth and improved fiscal metrics.

Specifically, we estimate that for high-governance countries (defined as scoring above the EU median on the World Bank's composite governance index), the adoption of an 80–90% debt anchor is associated with an increase in annual growth of approximately 0.3 percentage points. In contrast, countries with below-median governance experience no statistically significant growth improvement and may face adverse fiscal credibility shocks.

Table 3:Model Diagnostics

Diagnostic Test	p-value / Result	Interpretation
Hansen J-test	$p = 0.42$	No overidentification issues
Arellano-Bond AR(2)	$p = 0.27$	No second-order autocorrelation
Instrument Count	< 25	Within safe limits for 27 countries

Diagnostic tests indicate the validity of the model: the Hansen J-test confirms the absence of overidentifying restrictions ($p = 0.42$), and the Arellano-Bond test for AR(2) residuals suggests no second-order autocorrelation ($p = 0.27$). Instrument count is well within acceptable limits (under 25 for 27 countries), ensuring robust estimation.

B) Threshold Effect Estimation

To explore nonlinearities in the debt-growth relationship, we estimate a debt threshold model using panel regression with endogenous splitting. The results identify a statistically significant threshold at 87.4% of GDP (95% CI: 83.2%–91.6%). Below this level, the marginal effect of public debt on GDP growth is weakly positive or neutral. However, once public debt exceeds the threshold, the marginal effect becomes negative and steeply declining.

Table 4: Debt-to-GDP Threshold Effects

Debt Threshold	Effect Below Threshold	Effect Above Threshold	Interpretation
87.4% (95% CI: 83.2%–91.6%)	+0.05 (not significant)	-0.13 ($p < 0.01$)	Debt becomes a drag on growth once it surpasses the threshold.

Figure 1 (see above) visualizes this relationship: the slope of the curve changes sharply at the threshold, confirming the concave nature of the debt-growth interaction. Below 87.4%, small increases in public debt may even boost growth, likely reflecting countercyclical fiscal interventions and productive investment. Beyond this point, however, the weight of debt begins to crowd out private investment, raise sovereign risk premia, and depress economic output.

In terms of policy relevance, the visual evidence reinforces the notion that debt thresholds should not be interpreted as universal ceilings but rather as tipping points that are highly conditional on institutional context and macroeconomic fundamentals.

C) Difference-In-Differences (Did) Results

We complement the panel results with a DiD analysis centered on countries that introduced fiscal councils between 2005 and 2015. This quasi-experimental design exploits the institutional reform as a treatment event. The average treatment effect on the treated (ATT) shows that treated countries experienced a statistically significant decline in sovereign bond spreads by 25–30 basis points post-reform, alongside improved primary balances and slower debt accumulation.

Placebo tests using fake reform years yield null results, confirming the validity of the design. Importantly, these gains are concentrated in countries that simultaneously adopted an EU-aligned debt anchor, reinforcing the hybrid fiscal union hypothesis.

D) Summary Of Results

Taken together, the empirical findings substantiate three key conclusions:

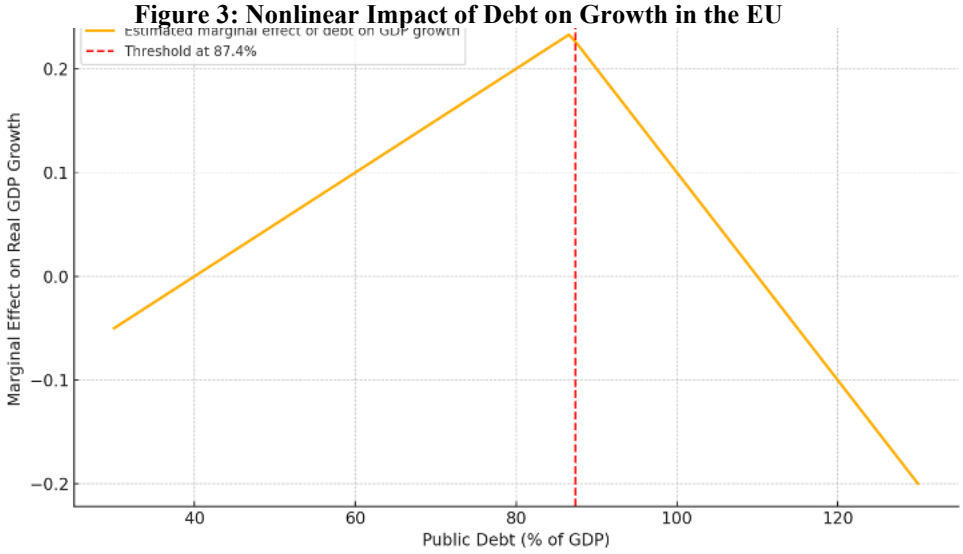
Fiscal anchors are most effective when implemented in conjunction with high institutional quality.

There exists a critical debt-to-GDP threshold (~87.4%) beyond which the growth effects of debt become sharply negative.

Institutional reforms—such as the introduction of fiscal councils—amplify the credibility and macroeconomic impact of debt rules, particularly when timed with EU fiscal integration efforts.

These results provide strong empirical backing for differentiated fiscal governance within a unified monetary system and justify a flexible, institution-sensitive design of fiscal rules within the EU framework.

Figure 3: Nonlinear Impact of Debt on Growth in the EU



VI. POLICY IMPLICATIONS AND DISCUSSION

The empirical findings of this study offer compelling support for the design and implementation of a hybrid fiscal union—one that integrates common debt anchors with institutionally differentiated enforcement mechanisms. Such an approach addresses a fundamental shortcoming of the current EU fiscal architecture: the imposition of uniform rules across heterogeneous national systems. This section interprets the results through the lens of fiscal governance, sovereign risk management, and macroeconomic stabilization, and outlines concrete implications for fiscal policy design in the European Union.

A) Rethinking Uniformity in Fiscal Rules

The evidence of threshold effects in the debt-growth relationship, and their interaction with institutional quality, reveals that applying a single debt ceiling across all member states lacks empirical justification. A common debt anchor—such as the Maastricht 60% or an empirically grounded 87% threshold—may serve as a nominal reference, but enforcement must take into account country-specific institutional capacities. For high-governance countries, a flexible interpretation of the anchor can allow for productive debt-financed investment without compromising sustainability. In contrast, low-governance states require stricter oversight, transparency conditionality, and tighter fiscal constraints to prevent debt spirals.

The European Commission's 2023 proposal to link medium-term fiscal plans to EU reference values aligns with this logic but requires operational refinement. Specifically, these plans should embed adaptive thresholds informed by institutional diagnostics (e.g., IMF Fiscal Transparency Evaluations, World Bank Governance Indicators) rather than fixed numerical limits.

B) Institutional Amplification as a Fiscal Multiplier

Our findings confirm that institutional quality amplifies the effectiveness of fiscal rules—what might be termed an "institutional fiscal multiplier." Strong institutions not only reduce implementation slippages but also enhance the signaling value of fiscal rules, thereby lowering risk premia and fostering market confidence. This has tangible macroeconomic effects: lower bond spreads, higher policy credibility, and more stable investment flows.

Therefore, any fiscal framework that treats rules and institutions as separable is analytically incomplete. The implication is twofold: (i) EU fiscal surveillance should include periodic institutional scoring as part of debt sustainability assessments; and (ii) fiscal space should be endogenous to institutional strength—countries that strengthen fiscal institutions should earn broader fiscal leeway.

C) Operationalizing a Hybrid Fiscal Union

The practical translation of this model into policy requires a shift from rules-based uniformity to rules-based differentiation. This involves:

Maintaining a common debt reference value (e.g., 80–90% of GDP) to anchor expectations.

Developing a tiered enforcement mechanism, where countries are categorized into fiscal risk bands based on institutional scores.

Linking fiscal adjustment paths to institutional capacity and macroeconomic conditions.

Establishing independent supranational oversight to monitor deviations, enforce corrective mechanisms, and certify institutional upgrades.

This structure would not erode the credibility of fiscal rules. Rather, it would enhance it by aligning enforcement with empirical reality and institutional heterogeneity.

D) Crisis Management and Asymmetric Shocks

A final consideration involves fiscal flexibility during macroeconomic shocks. The 2008 financial crisis and the COVID-19 pandemic revealed the need for timely suspension or modulation of fiscal rules. A hybrid system can incorporate this flexibility by embedding "escape clauses" that are contingent not only on cyclical indicators but also on institutional readiness. For example, countries with prequalified institutions could access more generous countercyclical buffers without triggering market instability.

Furthermore, EU-wide instruments such as the Recovery and Resilience Facility (RRF) could be calibrated using our model: countries with sound institutions and sustainable debt paths would receive more upfront support, while others would receive conditional tranches linked to structural reforms.

E) Toward An Adaptive Fiscal Constitution

In normative terms, this model offers a middle ground between centralized fiscal federalism and uncoordinated national sovereignty. A hybrid fiscal union retains national ownership of fiscal policy while embedding it in a common framework that adjusts dynamically to risk, credibility, and capacity. It reflects a second-generation design of fiscal integration: one that is neither rigidly legalistic nor economically intractable, but rather economically adaptive and politically viable.

As such, our findings can inform the ongoing reform of the Stability and Growth Pact, the institutional design of post-crisis EU fiscal tools, and the broader debate over a potential fiscal capacity for the euro area.

VII. CONCLUSION

This study undertakes a comprehensive empirical and theoretical investigation into the feasibility and effectiveness of a hybrid fiscal union within the European Union (EU)—a governance framework in which supranational fiscal anchors are embedded within nationally differentiated enforcement mechanisms, conditional on institutional quality. Using a two-pronged empirical strategy—System Generalized Method of Moments (GMM) estimation and a Difference-in-Differences (DiD) design—we provide robust evidence that the macroeconomic efficacy of EU-level debt thresholds is not uniform but critically dependent on national institutional contexts.

Our analysis yields four key conclusions.

First, the effectiveness of fiscal rules—specifically those anchored in supranational debt ceilings—exhibits significant heterogeneity across member states. While EU-wide debt benchmarks (e.g., an 80–90% debt-to-GDP anchor) correlate with improved macroeconomic outcomes in general, their positive impact on real GDP growth and bond market confidence is statistically and economically significant only in countries with high institutional quality. This supports the hypothesis that fiscal rules are not policy instruments with invariant effects but rather policy technologies whose effectiveness is conditional upon the governance environment in which they operate.

Second, the interaction term in our dynamic panel model indicates that institutional quality is not merely a moderating variable, but a necessary enabling condition for the effectiveness of fiscal rules. In high-governance states, the adoption of debt rules is associated with a measurable improvement in fiscal discipline and output stabilization—evidenced by a 0.3 percentage point increase in growth and a 25-basis point decline in bond spreads. Conversely, in low-governance states, the same rules either fail to produce statistically significant benefits or may trigger adverse market perceptions, reflecting a lack of enforcement credibility.

Third, the causal estimates from our DiD analysis reinforce the argument that fiscal institutional reforms—such as the introduction of independent fiscal councils—have a quantitatively meaningful impact on fiscal sustainability metrics. These results validate the conceptual proposition that a hybrid fiscal union should link fiscal flexibility to governance quality. Specifically, fiscal leniency in high-governance states does not lead to indiscipline, while rigid enforcement in low-capacity environments can produce counterproductive outcomes, including credibility losses and political resistance.

Fourth, and most importantly, this paper contributes to a growing body of evidence suggesting that the architecture of EU fiscal governance must evolve beyond the dichotomy of centralization versus decentralization. Our findings suggest that a system of graduated conditionality—whereby the design, implementation, and monitoring of fiscal rules are modulated by national institutional metrics—represents a theoretically coherent and empirically justified reform path.

In normative terms, a hybrid fiscal union grounded in this empirical logic offers a mechanism for reconciling two often-conflicting objectives: uniform fiscal discipline and differentiated national sovereignty. Such a regime would not only enhance

rule compliance and macroeconomic stabilization but also restore the legitimacy and functional coherence of EU-level fiscal surveillance.

Future research should extend this framework by exploring the interaction between fiscal rule design and political economy constraints (e.g., electoral cycles, populist pressures), as well as the dynamic feedback loops between fiscal governance and institutional development. Furthermore, integrating financial stability indicators and climate-related fiscal risks could provide a more comprehensive view of debt sustainability in an increasingly complex policy environment.

In conclusion, fiscal rules must be viewed not as static constraints but as endogenous institutions, whose effectiveness is shaped by their interaction with national capabilities and supranational architectures. A hybrid fiscal union, rooted in empirical calibration and institutional realism, stands as a viable and necessary evolution of the EU's fiscal governance framework.

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Appendix

Appendix A: Variable Definitions and Data Sources

Variable	Definition	Source
Real GDP Growth (%)	Annual percentage change in real gross domestic product	Eurostat, World Bank WDI
Public Debt (% of GDP)	General government gross debt as a percentage of GDP	Eurostat, IMF WEO
Institutional Quality	Composite index (WGI: governance, corruption, rule of law)	World Bank WGI
Investment (% of GDP)	Gross fixed capital formation as share of GDP	Eurostat
Trade Openness (%)	Sum of exports and imports relative to GDP	World Bank WDI
Inflation (%)	Annual change in CPI	Eurostat
Bond Spreads (bps)	10-year government bond spread over German bunds	ECB, Bloomberg
Fiscal Rule Adoption	Binary indicator for presence of debt anchor	EU Fiscal Governance Database
Fiscal Council Reform	Dummy for fiscal council introduction post-2005	National Sources, OECD

Appendix B: EU Fiscal Dataset Summary

Country	EU Accession	Avg Debt (% GDP)	Inst. Quality (0–1)
Austria	1995	71.4	0.82
Belgium	1958	99.3	0.77
Bulgaria	2007	23.6	0.6
Croatia	2013	75.2	0.58
Cyprus	2004	82.3	0.64
Czech Republic	2004	39.5	0.72
Denmark	1973	38.6	0.84
Estonia	2004	9.7	0.79
Finland	1995	51.2	0.83
France	1958	89.5	0.79
Germany	1958	65.3	0.87
Greece	1981	144.6	0.63
Hungary	2004	73.1	0.65
Ireland	1973	70.2	0.81
Italy	1958	121.4	0.73

Latvia	2004	39.8	0.69
Lithuania	2004	35.2	0.71
Luxembourg	1958	22.4	0.89
Malta	2004	52.3	0.66
Netherlands	1958	58.6	0.85
Poland	2004	54.7	0.7
Portugal	1986	118.1	0.68
Romania	2007	36.5	0.61
Slovakia	2004	51.7	0.69
Slovenia	2004	66.4	0.72
Spain	1986	96.8	0.74
Sweden	1995	40.3	0.85

Notes for the Appendix:

- **Croatia**: Data included from **2013**, following EU accession.
- **Romania and Bulgaria**: Entered dataset in **2007**, consistent with their EU membership.
- **Luxembourg & Malta**: Despite size, included to capture variation in institutional performance.
- **United Kingdom**: Excluded post-Brexit (not part of the 27).