Sosyoekonomi

2026, Vol. 34(67), 73-95

RESEARCH ARTICLE

ISSN: 1305-5577
DOI: 10.17233/sosyoekonomi.2026.01.04
Date Submitted: 09.01.2025
Date Revised: 05.03.2025
Date Accepted: 26.10.2025

First- and Second-Generation Fiscal Rules: Fiscal Sustainability and Public Debt Management in the European Union and Türkiye

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Birinci ve İkinci Nesil Mali Kurallar: Avrupa Birliği ve Türkiye'de Mali Sürdürülebilirlik ve Kamu Borç Yönetimi

Abstract

This study examines the effects of first- and second-generation fiscal rules on fiscal sustainability and public debt management, focusing on European Union countries that implement these rules and Türkiye, which does not have such regulations. It explores the temporal effects of interest rates and the role of fiscal rules in borrowing costs. Last year's interest rate increase raised borrowing costs, while a two-year lagged interest rate decrease them. A budget surplus lowers borrowing costs, although the impact of public debt remains limited. Inflation increases borrowing costs. First-generation fiscal rules enhance the budget balance, whereas second-generation rules boost fiscal discipline. The findings highlight the vital role of fiscal rules in debt sustainability and budget stability.

Keywords : Fiscal Rules, Fiscal Policy, Second-Generation Fiscal Rules, Public Debt Management.

JEL Classification Codes : E62, H62, H63, H68.

Öz

Bu çalışma, birinci ve ikinci nesil mali kuralların mali sürdürülebilirlik ve kamu borcu yönetimi üzerindeki etkisini incelemekte, bu kuralları uygulayan Avrupa Birliği ülkelerine ve böyle bir mali düzenlemeye sahip olmayan Türkiye'ye odaklanmaktadır. Çalışma, faiz oranlarının zaman içindeki etkisini ve mali kuralların borçlanma maliyetleri üzerindeki rolünü analiz etmektedir. Önceki yılın faiz oranı borçlanma maliyetlerini artırırken, iki yıl öncesinin faiz oranı azaltıcı bir etkiye sahiptir. Bütçe dengesi borçlanma maliyetlerini düşürmekte, ancak kamu borcunun etkisi sınırlı kalmaktadır. Enflasyon ise borçlanma maliyetlerini artırmaktadır. Birinci nesil mali kurallar bütçe dengesini güçlendirirken, ikinci nesil mali kurallar mali disiplini sağlamaktadır. Sonuç olarak mali kurallar, borç yönetimini ve bütçe istikrarını pozitif etkilemektedir.

Anahtar Sözcükler : Mali Kurallar, Maliye Politikası, İkinci Nesil Mali Kurallar, Kamu Borç Yönetimi.

1. Introduction

The first-generation fiscal rules are strict, mechanical, and based on deficits, debt, expenditures, and revenues. These rules adhere to principles of fiscal sustainability and budget performance (Peach, 2012: 217, 228). In contrast, second-generation fiscal rules incorporate an adaptive framework that enables them to respond to economic conditions. They are highly sensitive to the business cycle and prioritise fiscal discipline (Eyraud et al., 2018: 5). One of the initial perspectives on fiscal rules was from the public choice theory: fiscal rules were essential for promoting better fiscal responsibility (Buchanan & Wagner, 1977; Brennan & Buchanan, 1980).

Subsequent studies have concentrated on the impact of fiscal rules on government interest payments in the modern context (Von Hagen & Harden, 1995). Likewise, other research has indicated that budgetary rules are a vital missing element for debt sustainability and the reduction of interest payments (Kopits & Symansky, 1998).

Public debt increased unsustainably during the 1980s debt crises in many countries, illustrating why fiscal rules are necessary to maintain fiscal discipline. For instance, international fiscal frameworks such as the Maastricht criteria (Wyplosz 2012: 3) in the European Union (EU) serve to control debt and budget deficits. Initially, fiscal norms featured strict and straightforward constraints aimed at enforcing budget balance and a debt ceiling. However, these regulations were often too rigid and failed to respond effectively to the business cycle during crises (Kopits & Symansky, 1998: 1).

After that, the subsequent fiscal regulations and second-generation instruments introduced escape hatches and surveillance, enhancing flexibility. This increased flexibility improved their crisis response and supported economic stability (Schaechter et al., 2012). Additionally, next-generation fiscal rules have boosted transparency and accountability, leading to better implementation (Blanchard et al., 2010).

In countries like Türkiye, where neither first- nor second-generation fiscal rules are enforced, maintaining fiscal discipline becomes more difficult, leading to larger budget deficits and higher borrowing costs. Budget deficits and high debt-to-GDP ratios can undermine the effectiveness of public debt management, posing threats to debt sustainability (Von Hagen & Harden, 1995: 774). When interest rates rise, high public debt places a heavy burden on public finances without fiscal rule constraints (Blanchard & Giavazzi, 2004: 25). Interest payments directly reflect the cost of the debt stock. Without them, public finances can face significant financial impacts (Berg, 1999: 12). Flexible Rule Fiscal enables debt sustainability to adjust within cycles influenced by flexible fiscal rules (Eyraud et al., 2018: 27).

This study investigates the impact of first- and second-generation fiscal rules on managing public debt. It focuses on entities within the European Union that have strengthened fiscal rules and Türkiye, which lacks such principles, from 2008 to 2022. This

period encompasses economic recovery after the global financial crisis, the development of fiscal regulations in the European Union, and the effects of the COVID-19 pandemic on public finances. It provides a vital framework for understanding how fiscal rules function under different economic conditions. Most previous studies either examine developed countries or analyse broad macroeconomic effects. In contrast, this research empirically assesses the influence of first- and second-generation fiscal rules on public debt management and borrowing costs by comparing the European Union and Türkiye. It also adds to the literature by evaluating the role of variables like inflation and market dynamics in the effectiveness of fiscal rules. Furthermore, the European Union countries included in the study are: Germany, Austria, Belgium, Bulgaria, Czechia (Czech Republic), Denmark, Estonia, Finland, France, Croatia, Netherlands, Ireland, Spain, Sweden, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Poland, Portugal, Romania, Slovakia, Slovenia, and Greece.

The study employs a dynamic system, the Generalised Method of Moments (GMM), to assess the impact of fiscal rules on public debt management. This method is used for simulation purposes to demonstrate how past fiscal policies have shaped current fiscal discipline and economic growth (Arellano & Bover 1995: 30-31). To increase the robustness of our results, we adopt the System GMM approach, following Blundell & Bond (1998). This method effectively tackles endogeneity issues by using lagged values of explanatory variables as instruments. Doing so ensures that simultaneity problems do not bias the estimated relationship between public debt and its determinants. We analyse the effects of fiscal rules using lagged variables as instruments, particularly in crisis-affected areas.

The study will establish a theoretical framework and review existing literature. The dataset and methodology will then be introduced. The results, along with a discussion and conclusion, will be presented subsequently.

Three hypotheses will be examined in this study:

H1: Fiscal rules (both first- and second-generation) have a positive impact on managing public debt.

H2: Fiscal rules do not considerably affect public debt management.

H3: Fiscal rules are neutral, while other factors effectively manage debt.

2. Theoretical Framework and Literature Review

First-generation fiscal rules are characterised by their simplicity and rigidity. They aim to limit budget deficits and ensure debt sustainability by setting fixed targets, such as a specific debt-to-GDP ratio. However, these rules do not consider economic fluctuations (Kopits & Symansky, 1998: 11).

The study conducted by Kopits and Symansky (1998) examines the effects of different fiscal rules implemented in the USA, Japan, Germany, Canada, France, Italy, and

the UK on public debt management and borrowing costs. The analysis, covering the 1980s and early 1990s, evaluated various fiscal policy scenarios using stochastic simulation. The findings show that implementing the budget balance target through public expenditures, transfer expenditures, and tax adjustments significantly affects public borrowing costs and debt sustainability. In the USA, the public borrowing interest rate is calculated as 1.78% under the baseline scenario, but it rises to 2.60% with the adjustment of public expenditures. It is observed that tax adjustments have a more limited effect, and borrowing costs remain at 1.92%. In Japan, borrowing costs, which are 3.29% in the baseline scenario, increase to 5.22% with changes in public expenditure. In Germany, borrowing costs, initially calculated as 3.06%, rise to 3.93% with changes in public spending. In Canada, France, and Italy, it was found that changes in public expenditure and tax policies had varying impacts on borrowing costs. Specifically, in Italy, public expenditure adjustments increase borrowing costs by up to 4.51%. In the United Kingdom, it was observed that borrowing costs rose from 3.33% to 5.94% following the implementation of fiscal restrictions, clearly demonstrating the impact of fiscal rules on public borrowing costs. Overall, the study's findings suggest that different fiscal rules can markedly influence public borrowing costs and that the effects of public expenditure adjustments on debt sustainability are particularly significant. Nonetheless, the level of flexibility of fiscal targets, the implementation processes, and economic conditions emerge as critical factors in determining the effectiveness of fiscal rules. In this context, Türkiye's high borrowing costs and budget imbalances, stemming from the absence of fiscal rules, have become more evident than those of EU countries.

In contrast, second-generation fiscal rules aim to promote fiscal sustainability and stability by introducing flexibility and escape clauses that allow adaptation to economic fluctuations (Eyraud et al., 2018: 25). This study investigates the effects of fiscal rules on budget deficits and debt sustainability across 142 countries from 1985 to 2015. Using panel data analysis, it reveals that fiscal rules enhance budget discipline and improve public debt sustainability. The findings indicate that the budget deficit is, on average, 0.6 percentage points lower than GDP in countries with fiscal rules in place. This effect is more pronounced in developed countries and varies depending on institutional capacity and implementation mechanisms in developing nations. Additionally, public debt is, on average, 5-10% lower where fiscal rules are strictly enforced. The effectiveness of fiscal rules is also found to be 20% higher in countries with robust institutional frameworks. The study underscores that strict fiscal rules can sometimes hinder economic growth; therefore, rules incorporating flexibility and country-specific adjustments tend to be more successful. Overall, the results highlight that the design and implementation of fiscal rules are crucial for maintaining budget discipline.

The introduction of second-generation rules within the European Union took place with the Maastricht Treaty; however, they have faced criticism for their perceived lack of flexibility (Von Hagen & Harden, 1995: 772). This study analyses how the institutional structures of budget processes influence public expenditures, budget deficits, and public debt. Covering 12 European Union countries between 1981 and 1990, it employed panel

data analysis and regression methods. The findings reveal that countries with tighter budget processes experienced lower public expenditures and budget deficits. Between 1981 and 1985, the ratio of public spending to GDP was 48.0%, the budget deficit was 2.7%, and the public debt stock stood at 42.5% in countries with strong fiscal discipline. Conversely, in countries with looser budget controls, public expenditures reached 49.7%, the budget deficit was 10.7%, and the public debt stock was 74.6%. From 1986 to 1990, public expenditure decreased to 45.5%, the budget deficit to 1.2%, and the public debt stock to 43.2% in fiscally disciplined countries. In contrast, countries with more flexible budget processes had rates of 51.6%, 11.2%, and 100.1%, respectively. Overall, the study suggests that the impact of budget processes on public finances is significant, with lower levels of budget deficits and public debt in countries enforcing strict budget rules. Additionally, fiscal discipline appears more assertive, and public expenditures are more controlled in countries where the central government holds greater authority over the budget process. It was also observed that coalition governments tend to adopt target-oriented budget processes, whereas procedural budget processes prove more effective in larger economies.

The development of second-generation rules in the 2000s was driven by the need to respond to crises and address issues of fiscal slippage (Blanchard & Giavazzi, 2004: 20). This study analyses the effects of the Financial Stability and Growth Pact (SGP) on public investments in European Union countries. Conducted using panel data analysis and simulation methods, it examines the restrictions of the SGP on public debt management and potential reform proposals. The findings indicate that excluding net public investments from budget deficits will cause the debt-GDP ratio to align with the ratio of public capital to GDP in the long term. It has been determined that under the current system, the ratio of public investment expenditures to GDP in 12 Eurozone countries, which was 4% in the 1970s, decreased to 2.5% in 1998. Additionally, net public investments are close to zero, especially in Germany, Italy, Belgium, and Austria. According to the analysis, strict enforcement of the SGP rules suppresses public investments and hampers sustainable public debt management. As an alternative, it is proposed that public investments be separated from the budget by considering depreciation costs, thereby reducing pressure on the public finance balance in the long run. Modelling results indicate that in countries like Germany, public investment expenditures could be increased by 0.8% relative to GDP if the new system is adopted. The study emphasises that SGP reforms should focus on budget deficits, public debt, and investment; otherwise, restrictions on investment will negatively impact long-term growth.

Existing studies have extensively analysed the relationship between fiscal rules and public debt management using various macroeconomic indicators. Prior research has demonstrated that fiscal rules reduce borrowing costs by enhancing market confidence and ensuring budgetary discipline. Moreover, empirical findings indicate that inflation dynamics and sovereign risk perceptions are crucial in shaping public debt sustainability. Building upon this literature, this study incorporates additional macroeconomic variables to provide a more comprehensive assessment of how fiscal rules influence borrowing costs and debt dynamics. By refining the empirical framework, this study offers an expanded perspective

on the effectiveness of fiscal rules in managing public debt. Bergman et al. (2016) conducted significant research assessing the impact of fiscal rules on public debt sustainability in 27 EU countries from 1990 to 2012 and within the dynamic system GMM. Their findings indicated that these rules effectively reduced interest payments, substantiating the hypothesis. The key variables in this study -fiscal rule existence, public debt-to-GDP ratio, and borrowing cost-provide critical insights into the determinants of public debt interest payments. Specifically, fiscal rules enhance debt sustainability by improving market confidence, while the debt-to-GDP ratio reflects the relative burden of public debt within the economy. Additionally, borrowing costs are a fundamental measure of the interest burden on public finances, offering a comprehensive perspective on debt management policies.

In the study conducted by Tapsoba (2012), the effect of fiscal rules on fiscal discipline was examined in 74 developing countries between 1990 and 2007. The two-stage least squares method controlled for selection bias in adopting fiscal rules. The findings indicate that adopting fiscal rules improved the primary budget balance, adjusted for cyclical effects, by 0.64% to 1.18% of GDP. The effectiveness of fiscal rules varies by type, with budget balance rules and expenditure rules significantly increasing fiscal discipline. Conversely, the impact of debt rules was not statistically significant. Additionally, the study found that the influence of fiscal rules was more pronounced in countries that adopted more than one fiscal rule, implemented these rules over a longer period, and maintained higher government stability. The results reveal that fiscal rules play a crucial role in maintaining fiscal discipline in developing countries with weak institutional frameworks.

The study by Piątkowski (2024) analysed the effects of stock-flow adjustments (SFA) on public debt in European Union countries. Covering 2002-2022, it employed a panel data model and fixed effects method. The research evaluated public finance data from 27 European Union countries using Eurostat data. The findings demonstrate a significant relationship between SFA and public debt, budget balance, and GDP dynamics. Notably, an increase in public debt and an improvement in the budget balance were found to raise the level of SFA. According to the model estimates, every 1-point rise in the ratio of public debt to GDP increased SFA by 0.025%. Conversely, an increase in budget revenues was associated with a 0.19% decrease in SFA. It was also observed that a higher GDP growth rate had a negative impact on SFA. The results suggest that governments used stock-flow adjustments to conceal budget deficits during periods of tightening fiscal rules. It is stated that public finances have become less transparent due to off-budget operations, particularly in countries with high levels of public debt. Finally, it is emphasised that SFA should be monitored more closely, and fiscal rules should be more comprehensively implemented to enhance transparency in public finances and maintain the sustainability of public debt.

In the study conducted by Stawiarska (2023), the effects of second-generation numerical fiscal rules on public debt management across 27 European Union countries between 2008 and 2021 were analysed. The relationship between fiscal rules, debt service costs, and the quality of corporate governance was examined using the Generalised Method

of Moments (GMM) and a dynamic panel model. The findings indicate that robust fiscal rules lower the interest costs of public debt. The coefficient of the Fiscal Rule Strength Index was negative and significant across all models, with a value of -0.1560, suggesting that tightening fiscal rules enhances debt management efficiency. The relationship between the budget balance, adjusted for cyclical effects, and debt interest costs was negative, with a coefficient of -0.0410, showing that increased budget discipline reduces borrowing costs. Conversely, debt service costs rise as public debt levels increase, with a coefficient of 0.0159 between public debt and debt interest costs. A positive association was identified between 10-year government bond yields and debt service costs, with a coefficient of 0.0656. The variable representing political stability and absence of violence or terrorism had a negative impact on borrowing costs, with a coefficient of -0.0063. This suggests that improved corporate governance supports debt sustainability. The results demonstrate that second-generation fiscal rules effectively manage public debt; however, their implementation and design are crucial for ensuring fiscal sustainability. Strengthening fiscal rules, increasing budget discipline, and enhancing governance quality are vital for reducing borrowing costs.

Table: 1
Empirical Studies

Author & Year	Sample (Countries)	Period & Variables	Study Findings
Kopits & Symansky (1998)	USA, Japan, Germany, Canada, France, Italy, United Kingdom	1980-1990 Public expenditures, transfer payments, tax regulations, and public borrowing costs	Budget balance targets significantly affect public spending and borrowing costs, ensuring debt sustainability.
Eyraud et al. (2018)	142 countries	1985-2015 Budget deficit, debt sustainability, fiscal rules	Fiscal rules strengthen budget discipline, improving debt sustainability. The public debt-to-GDP ratio could be 5-10% lower.
Von Hagen & Harden (1995)	12 European Union countries	1981-1990 Public expenditures, budget deficit, public debt	Strict budget processes enhance fiscal discipline, while lenient ones increase public debt stock and deficits.
Blanchard & Giavazzi (2004)	12 Eurozone countries	2002-2022 Public investments, budget deficit, and debt management	Strict fiscal rules may constrain public investments. The net public investment-to-GDP ratio fell to 2.5% in 1998.
Tapsoba (2012)	74 developing countries	1990-2007 Fiscal discipline, budget balance, and debt rules	Fiscal rules improved the budget balance by 0.64% to 1.18% of GDP. The effect of debt rules was not statistically significant.
Bergman et al. (2016)	27 European Union countries	1990-2012 Fiscal rules, interest payments, and debt sustainability	Strengthening fiscal rules reduces interest payments and improves debt management.
Stawiarska (2023)	27 European Union countries	2008-2021 Fiscal rules, debt servicing costs, and governance quality	Fiscal rules reduce debt interest costs. A positive relationship exists between public debt and debt interest costs (0.0159).
Piątkowski (2024)	27 European Union countries	2002-2022 Stock-flow adjustments (SFA), public debt, and budget balance	A 1 percentage point rise in the public debt-to-GDP ratio leads to a 0.025% increase in SFA. Stringent fiscal regulations improve fiscal transparency.

Empirically, well-designed numerical fiscal rules enhance the effectiveness of fiscal policy (Schick, 2010; Bergman et al., 2016; Bandaogo, 2020). The first generation of fiscal rules focused more on enforcing limits on budget deficits and managing debt trajectories. However, these rules attracted considerable criticism for being relatively inflexible during economic cycles. Subsequent generations of fiscal rules are likely to be calibrated to respond more effectively to cyclical fluctuations in fiscal policy and to support greater flexibility and fiscal responsibility. Such adaptability indicates a degree of assurance that these rules remain robust amid economic uncertainties.

A growing body of research indicates that fiscal rules are crucial for adjusting economic balances (Maltritz & Wüste, 2015; Burret & Feld, 2018) and reducing public debt (Lüchinger & Schaltegger, 2013; Landon & Smith, 2017; Asatryan et al., 2018). Although early fiscal rules aimed to achieve these objectives, their rigidity often limited effectiveness during crises (Maltritz & Wüste, 2015; Burret & Feld, 2018). Conversely, second-generation fiscal rules have been found supportive of maintaining budgetary stability and implementing expansionary fiscal policies during recessions by establishing 'structural budget targets and cyclical adjustments as a blueprint. Structural budget targets are long-term estimates for the budget balance adjusted for the business cycle. Benefits include fiscal sustainability (reduced pro-cyclicality in budgeting) (Maltritz & Wüste, 2015; Burret & Feld, 2018). Enhanced response to economic shocks: The second generation of rules has improved countercyclical fiscal policy responses (Combes et al., 2017; Guerguil et al., 2017; Gootjes & de Haan, 2022). These rules have increased the ability for relevant discretionary interventions during crisis-related economic downturns; moreover, budget stabilisers have prevented large deficits.

Unlike existing studies, this research investigates in detail how the absence of fiscal rules affects borrowing costs in Türkiye. While many studies examine developed and developing countries, there is limited empirical analysis on debt management in countries where the institutional framework for fiscal rules is not fully developed, such as Türkiye. This research fills this gap by exploring the effects of Türkiye's lack of first- and second-generation fiscal rules on budget balance and borrowing costs. Using the dynamic system GMM method, the analysis carefully examines the relationship between fiscal rules and inflation and their impact on debt sustainability. It notably shows that the influence of fiscal rules is stronger in countries with high inflationary pressures. By comparing Türkiye with countries in the European Union, this study offers a broader assessment of how fiscal rules support long-term economic stability. Ultimately, this work enhances the literature by analysing the impact of fiscal rules on public borrowing costs and budget balance within the Turkish context.

3. Data and Methodology

3.1. Variables Employed in the Models

Fiscal rules are essential for managing public debt and strengthening fiscal resilience to economic cycles. This paper employs variables grounded in a solid theoretical foundation to assess these effects in a study of their impact. Debt interest as a proportion of GDP (dint) serves as a key indicator of fiscal discipline and debt dynamics; for countries like Türkiye, reducing the debt burden is necessary to promote growth and improve public debt management.

Lagged variables L1.dint and L2.dint are necessary to evaluate the impact of fiscal rules on historical debt accumulation. The first-generation rules, which focus on short-term incentives, are likely to have a somewhat limited effect in reducing past debt (Caselli &

Reynaud, 2020: 10-21). Conversely, second-generation rules are more comprehensive and include more specific targets (e.g., the cyclically adjusted budget balance, CAB), which enhance fiscal policy credibility.

Public debt as a percentage of GDP (*pdebt*) is a key indicator for assessing the impact of fiscal rules on public debt management. Public debt levels are higher in developing countries, and elevated public debt carries economic risks, so fiscal rules must be more effective. *INF* is the most significant macroeconomic variable, which also renders fiscal rules less effective.

Table: 2
Definition of Variables

Abbreviation	Variable	Source
dint	Interest paid on public debt (% of GDP)	IMF, <https://www.imf.org/external/datamapper/ie@FPP/ITA>
L1.dint	dint lagged from the previous period.	
L2.dint	dint has been delayed for two periods.	
cab	Cyclically-Adjusted Budget Balance (% of Potential GDP)	
pdebt	Public Debt (% of GDP)	
inf	Average consumer prices (Annual per cent change)	
fri	First-Generation Fiscal Rule Points	
frsi	Fiscal Rules Strength Index (Second-Generation Fiscal Rule Points)	
dnofr	First-Generation Fiscal Rule Dummy (indicates the presence of -0- or absence of -1- fiscal rule.)	Scores assigned by the authors based on the IMF Fiscal Rule Dataset.
dnofrs	Second-Generation Fiscal Rule Dummy (indicates the presence of -0- or absence of -1- fiscal rule.)	

This study stands out through its focus on theoretically grounded variable selection, differentiating it from previous empirical studies on implementing fiscal rules. The research highlights that although Türkiye's initial wave of fiscal regulations yielded immediate results, ongoing follow-up actions may threaten debt sustainability and fiscal responsibility. By incorporating these insights, this study adds to the existing literature on the long-term effectiveness of fiscal regulations and their vital role in managing public debt.

Drawing from the current literature, the following models have been developed (Combes et al., 2017; Guerguil, 2017; Stawiarska, 2023):

$$\text{Model 1: } d_{int} = \beta_1 d_{L1.dint} + \beta_2 d_{L2.dint} + \gamma_1 \text{cab} + \gamma_2 \text{pdebt} + \gamma_3 \text{inf} + \gamma_4 \text{fri} * \text{inf} + \varepsilon \quad (1)$$

$$\text{Model 2: } d_{int} = \beta_1 d_{L1.dint} + \beta_2 d_{L2.dint} + \gamma_1 \text{cab} + \gamma_2 \text{pdebt} + \gamma_3 \text{inf} + \gamma_4 \text{frsi} * \text{inf} + \varepsilon \quad (2)$$

$$\text{Model 3: } d_{int} = \beta_1 d_{L1.dint} + \beta_2 d_{L2.dint} + \gamma_1 cab + \gamma_2 inf + \gamma_3 dnofr * pdebt + \varepsilon \quad (3)$$

$$\text{Model 4: } d_{int} = \beta_1 d_{L1.dint} + \beta_2 d_{L2.dint} + \gamma_1 pdebt + \gamma_2 inf + \gamma_3 dnofrs * cab + \varepsilon \quad (4)$$

$$\text{Model 5: } d_{int} = \beta_1 d_{L1.dint} + \beta_2 d_{L2.dint} + \gamma_1 inf + \gamma_2 dnofr * cab + \gamma_3 dnofrs * pdebt + \varepsilon \quad (5)$$

The current research employed five models to analyse the effect of fiscal rules on interest payments, fiscal balance, and macroeconomic variables.

Model 1 analyses historical interest payment values to evaluate the impact of inflation and examines the interaction between first-generation fiscal rules and inflation.

Model 2 examines the adaptable structures of second-generation fiscal rules, exploring their interactions with economic variables and their impact on inflation.

Model 3 examines the relationship between first-generation fiscal rules and the debt stock, as well as the impact of interest payments on public debt as a percentage of GDP.

Model 4 assesses the link between the budget balance and second-generation fiscal rules, emphasising their function in fostering long-term fiscal discipline.

Model 5 combines the generational framework of fiscal rules with public debt and budget balance levels, providing a comprehensive perspective on their macroeconomic effects.

3.2. System GMM Model

The Generalised Method of Moments (GMM) dynamic system can be helpful in studying public debt management and fiscal policy in general. Firstly, it considers dynamic effects over time: lagged variables act as exogenous factors in a dynamic relationship (Arellano & Bover, 1995: 30-33). Secondly, by accounting for reverse causality through the use of lagged variables and incorporating firm-level data, the results become more reliable (Blundell & Bond, 1998: 116-117). Finally, efficient panel-data estimation is used to examine the economic implications of fiscal rules across countries and periods (Roodman, 2009: 103).

This research employs the Hansen test/J statistic (1982), which is essential to validate the robustness of GMM analyses when applied to dynamic systems. This test addresses the over-identification hypothesis and confirms the appropriateness of instrumental variables in the model, which is particularly important for managing dynamic relationships and endogeneity issues.

(i) The Hansen test enhances internal validity by assessing the bounds of instrumental variables, ensuring the model is not overly restrictive (Roodman, 2009: 125).

(ii) In the GMM specification, our primary approach is adopted to reduce endogeneity parameters. As such, the Hansen test is crucial for demonstrating that the instruments we used are valid, providing a check on whether there is no bias (due to endogeneity) concerning suitable instruments for the dependent variable (Blundell & Bond, 1998: 122).

(iii) Having too many instruments can produce results that appear very similar. Arellano and Bover (1995: 33) are the econometricians who refine our model through a specification test of the Hansen, confirming that instruments do not make the analysis overly complex (i.e., we are not over-instrumented).

(iv) According to Baum et al. (2013:18), "if the robust inference is sought in an instrumental variables model, the over-identification test can be calculated using a standard J statistic." Additionally, the J statistic/Hansen test is also referred to as the "robustified Sargan statistic" in two-step dynamic GMM estimation.

The dynamic system GMM model is effectively designed to analyse dynamic panel data. This framework includes lagged dependent variable values among the independent variables and is typically represented in a specific equation (Arellano & Bond, 1991; Baltagi, 2008).

$$y_{it} = \alpha y_{i,t-1} + X_{it}\beta + \eta_i + \varepsilon_{it} \quad (7)$$

y_{it}: Dependent variable for unit *I (e.g.*, country, firm) at time *t.*

$y_{i,t-1}$: Lagged dependent variable from the previous period (dynamic component).

X_{it}: Vector of independent variables (*k×1* dimension).

β: Coefficient vector for independent variables.

η_i: Time - invariant individual effects.

ε_{it}: Error term.

Dynamic panel data models, endogenous ($y_{i,t-1}$ and ε_{it} between) and unobserved heterogeneity (η_i). To solve these problems, the GMM method uses lagged values as instruments (This is why the variables L1.dint and L2.dint exist in the current study).

It is transformed by differencing to eliminate fixed individual effects as follows: η_i

$$\Delta y_{it} = \alpha \Delta y_{i,t-1} + \Delta X_{it}\beta + \Delta\varepsilon_{it} \quad (8)$$

Here $\Delta y_{it} = \alpha \Delta y_{i,t-1}$is the first difference of the dependent variable.

Fixed effects (η_i) are eliminated when differencing:

$$\Delta\eta_i = \eta_i - \eta_i = 0 \quad (9)$$

Moment conditions for the difference and level equations are utilised to guarantee the accuracy of the instruments.

$$E\left[y_{i,t-s} \cdot \Delta\varepsilon_{it}\right] = 0 \text{ for } s \geq 2, t = 3, \ldots, T \quad (10)$$

These moment conditions suggest that lagged values of the dependent variable may serve as instruments.

$$E\left[\Delta y_{i,t-1} \cdot \varepsilon_{it}\right] = 0 \text{ for } t = 2, \ldots, T \quad (11)$$

These conditions suggest that lagged differences can serve as instruments for the level equation.

The GMM estimation employs a weight matrix to optimise the moment conditions. The weight matrix is defined as:

$$W = (Z'\Omega^{-1}Z)^{-1} \tag{12}$$

Z: Instrument matrix

Ω: Covariance matrix of error terms.

The GMM Estimator is defined as follows:

$$\hat{\theta} = (Z'WZ)^{-1}Z'WY \tag{13}$$

To verify the validity of the estimate, Hansen tests, AR (1), and AR (2) tests must be performed.

The Hansen test is a method of assessing the validity of instruments. H_0: Instruments are valid.

AR tests are used to identify potential autocorrelation issues within the model. Specifically, the AR(1) test examines whether there is no first-order autocorrelation; the AR(2) test assesses the absence of second-order autocorrelation. Dynamic System GMM employs lags of variables as instruments by combining level and difference equations to manage endogeneity and unobservables in the dynamic panel data model. The Hansen test ensures the validity of the instruments, thus confirming the reliability of the parameter estimates and addressing autocorrelation issues observed in the AR(1) and AR(2) tests.

4. Findings

A comparative analysis of fiscal metrics in EU countries and Türkiye (2008-2022) clarifies the causes of borrowing costs, fiscal responsibility, and inflation control. EU nations' low interest rates on borrowing (1%-3%) stem from strict fiscal regulations and budget discipline among EU member states. In contrast, Türkiye faces higher borrowing costs (8% to 10%) due to the absence of fiscal rules, persistent budget deficits, and diminished market confidence. The elevated borrowing costs pose a significant threat to Türkiye's economy.

EU countries can only maintain stable and low inflation rates of 2% to 5% to ensure fiscal sustainability. This stability encourages lower borrowing premiums by fostering a fiscally responsible government and increasing market confidence. Conversely, Türkiye faces very high inflation rates of 30% to 40%, which significantly raise borrowing costs. High inflation can hinder effective public fiscal management, expand budget deficits, and increase perceived market risks.

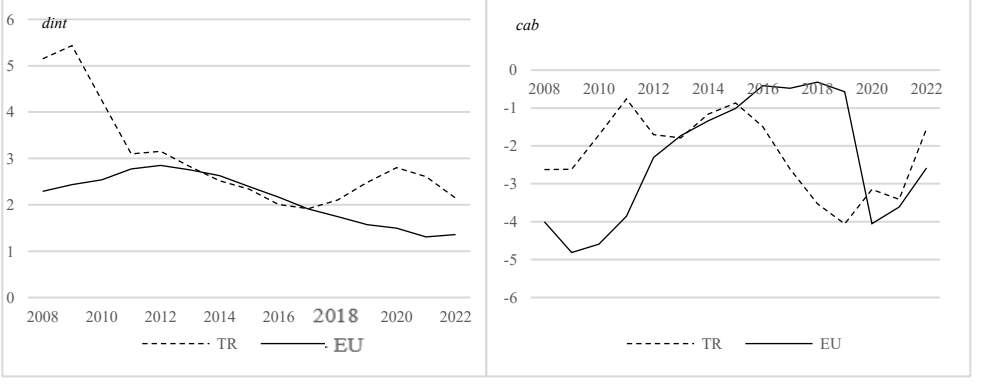
EU countries with well-established fiscal rules often exhibit higher public debt ratios, ranging from 60% to 90%, while experiencing lower borrowing costs. Conversely, Türkiye has a lower debt ratio of 30% to 40% but faces substantially higher borrowing costs. This paradox cannot be solely attributed to the presence or absence of fiscal rules. Instead, it suggests that macroeconomic stability, inflation expectations, investor confidence, and compliance with a wider set of fiscal discipline measures beyond formal regulations are vital in shaping borrowing costs.

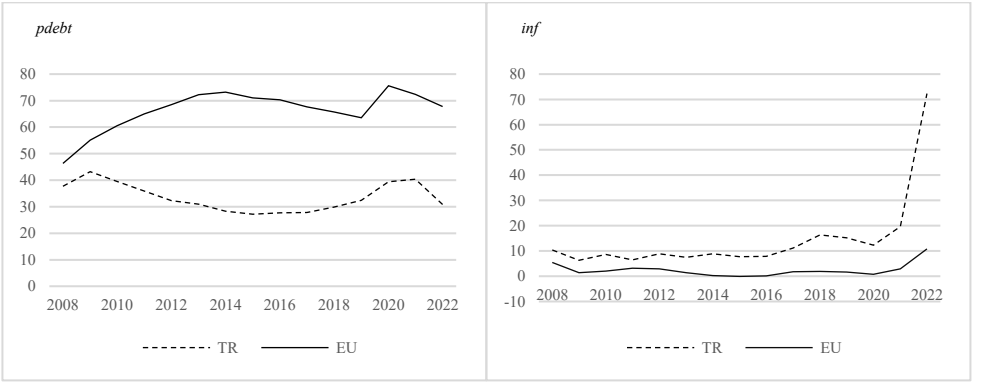
In the past, budgetary outcomes for EU countries have been neutral or positive, highlighting the effectiveness of fiscal rules in shielding budget stability from business cycles. On average, Türkiye has had a negative budgetary stance, although this momentum remains in favour of Türkiye due to increased economic strength. The opposition to inflation adversely affects how we interpret our budget balance, meaning we tend to overestimate our borrowing needs.

The analysis suggests that Türkiye requires significant fiscal reforms, especially in fiscal discipline and inflation control. Experiences from EU countries demonstrate that fiscal rules influence borrowing costs and help enhance economic stability. The only way for Türkiye to address high inflation, budget deficits, and fiscal deregulation is by pursuing a comprehensive reform programme. These reforms would lower borrowing costs and establish a stronger foundation for future economic sustainability through increased market confidence. When fiscal regulations are poorly managed, the consequences for Türkiye's budgetary balance and debt servicing are much more severe than in EU countries. Therefore, fiscal rules can help reduce Türkiye's borrowing costs and improve its economic viability.

Figure 1 illustrates the time series of the variables employed in the study.

Figure: 1
Variables (Time Series)



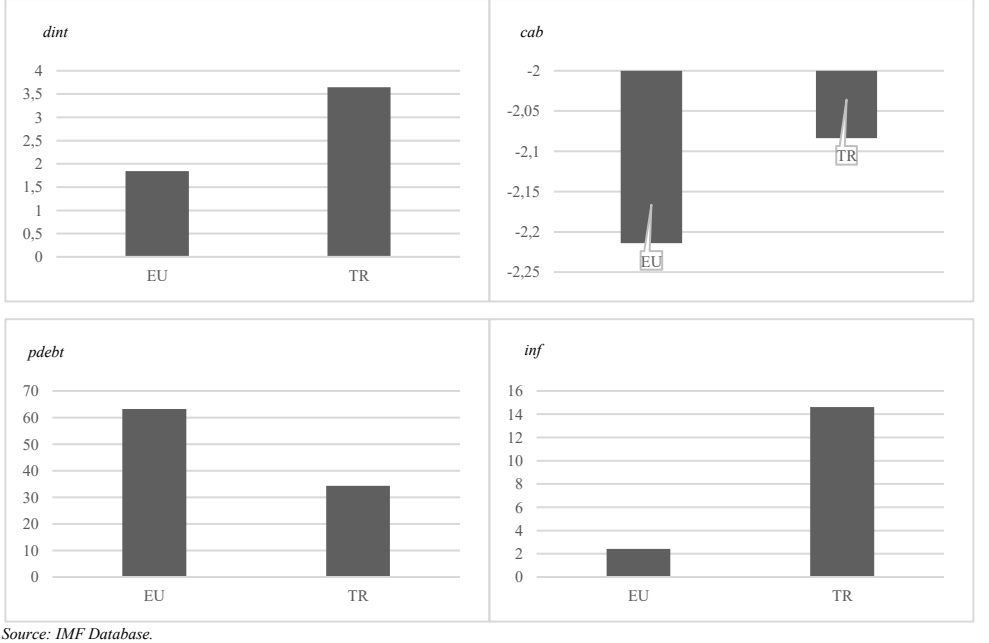


Source: IMF Database.

An analysis of data regarding interest payments, inflation, fiscal balance, and public debt levels of EU countries and Türkiye between 2008 and 2022 uncovers inconsistencies in fiscal performance and policy implementation.

As shown in Figure 2, the variables are depicted by their respective means.

Figure: 2
Variables (Averages)



Source: IMF Database.

Figure 2 shows average long-term values for 2008-2022, rather than the yearly changes seen in Figure 1. The study indicates that the stability and proper enforcement of fiscal rules in EU countries create a sustainable and dependable public finance framework. Türkiye's long-term fiscal indicators highlight structural weaknesses mainly caused by the lack of binding fiscal rules and ongoing high inflation. The absence of legally mandated fiscal guidelines reduces fiscal predictability and weakens investor confidence, causing fluctuations in risk premiums. Simultaneously, persistent high inflation increases borrowing costs, raising the real debt burden and limiting fiscal space. Therefore, Türkiye's structural fiscal weaknesses arise from both institutional fiscal limitations and macroeconomic instability. This comparison provides a factual basis to support that the instability of Türkiye's fiscal performance and budget discipline remain ongoing issues.

The results of the GMM estimation in Table 3 analyse the economic and fiscal variables that influence interest payments (% GDP). Interest payments (dint) were used as the dependent variable, and the effects of the independent variables were assessed using lagged values (L1.dint, L2.dint). The significance levels of the coefficients indicate the strength of the economic relationships, while the standard errors reflect the uncertainty (see details below in Table 3).

The table below shows the results of the two-step GMM model estimation process.

Table: 3
Dynamic GMM Model Estimation Results (Two-Step)

	(I)	(II)	(III)	(IV)	(V)
Dependent variable: *dint* Variable Coef. (*Standard Error*)					
L1.dint	1.3622* (0.104)	1.3652* (0.107)	1.3419* (0.104)	1.3726* (0.094)	1.2358* (0.175)
L2.dint	-0.3552* (0.098)	-0.3605* (0.099)	-0.3482* (0.094)	-0.3968* (0.084)	-0.3389* (0.137)
cab	-0.0254* (0.007)	-0.0263* (0.007)	-0.0253* (0.007)		
pdebt	-0.0003**** (0.000)	-0.0003**** (0.000)		0.0003**** (0.000)	
inf	0.0107** (0.004)	-0.0002**** (0.004)	0.0079*** (0.004)	0.0057**** (0.006)	0.0013**** (0.004)
fri * inf	0.0045* (0.001)				
frsi * inf		0.0008** (0.000)			
dnofr * pdebt			-0.0112* (0.001)		
dnofrs *cab				-0.0256*** (0.013)	
dnofr * cab					0.1031* (0.037)
dnofrs * pdebt					0.0087** (0.002)
con	-0.1199 (0.065)	-0.1027 (0.061)	-0.0954 (0.040)	-0.0390 (0.024)	0.1243 (0.079)
AR(1) (p-value)	0.017	0.017	0.017	0.014	0.025
AR(2) (p-value)	0.183	0.180	0.197	0.232	0.223
Hansen Test (p-value)	0.681	0.668	0.699	0.739	0.716
Wald Chi² (p-value)	0.000	0.000	0.000	0.000	0.000
VIF	<1.10	<1.09	<1.09	<1.04	<1.32
Instruments (Obs /Groups)	35 (420/28)	35 (420/28)	34 420/28)	34 (420/28)	34 (420/28)

*The symbols *, **, and *** indicate statistical significance levels of 1%, 5%, and 10%, respectively. The symbol **** indicates a result that is not statistically significant.*

In Model 1, the effects of lagged interest payments are evident. The coefficient for L1.dint is positive and significant (1.3622*), while L2.dint is significant and negative (-

0.3552*). This indicates a strong link with interest payments from the previous period, but this connection diminishes after two periods. Additionally, the adjusted budget balance (cab) is negative and significant (-0.0254*), suggesting that fiscal discipline can help reduce interest payments. Inflation (inf) raises interest payments (fri * inf: 0.0045), although first-generation fiscal rules mitigate this increase.

In the second model, we assess the effects of second-generation fiscal rules using the variable frsi * inf. The positive and highly significant coefficient (0.0008**) indicates that these fiscal rules can interact with inflation to increase interest payments. Similar to Model 1, the variables cab and pdebt also demonstrate significant effects. This suggests that fiscal rules aimed at long-term and complex objectives can influence interest payments.

The third model examines the impact of first-generation fiscal rules on the stock of debt. We observe that the dnofr*pdebt coefficient (-0.0112), which is significantly negative, indicates that without the first generation of rules, a higher debt stock tends to increase interest payments, as inflation (inf) is also significant (0.0079***) and reflects higher interest payments with rising inflation. Inf remains significant in this model (0.0079***), demonstrating that increasing inflation leads to higher interest payments. All these findings show that fiscal rules play an important role in effectively managing debt.

The fourth model employs four different models to investigate the complex relationship between second-generation fiscal rules and fiscal balance, thereby highlighting the significance of these variables. The negative and significant coefficient -dnofrs*cab (-0.0256**) aligns with the idea that higher interest payments occur when second-generation fiscal rules are weaker, resulting in poorer fiscal balance. This supports the view that fiscal rules with long-term and systematically motivated anchors can be more effective in enforcing macroeconomic discipline.

In the fifth model, a positive and significant coefficient (0.1031) indicates that the first-generation fiscal rules interact with the budget balance (dnofr*cab) to influence the budget. Conversely, second-generation fiscal rule-chosen debt shows little effect (0.0087**) in an interaction. This suggests that first-generation fiscal rules can effectively secure near-term objectives, though they may lead to undesirable outcomes in long-term debt management.

The Hansen test (>0.05) in each model confirmed the credibility of the instrumental variables, and the Wald Chi² test (<0.05) likely justified the overall significance of the models tested. The average Variance Inflation Factor (VIF) across the models was below 1.10, indicating that multicollinearity among the independent variables was not a major concern. These low VIF values, supported by sound results, suggest that each variable has an independent effect on the estimations. Together, these findings imply that the selected regressors are statistically significant and that the estimations are reliable.

These models provide us with a valuable perspective on fiscal regulations and macroeconomic factors affecting interest payments. The key components of this variable are inflation, the debt stock, the fiscal balance, and the nature of fiscal rules. Especially in countries like Türkiye, developing countries implementing fiscal rules and understanding how these rules interact with macroeconomic variables is essential in public finance. These models are significant as they build on the existing literature on this topic.

5. Discussion

In countries like Türkiye, the lack of fiscal rules has led to major structural issues in public finances, impacting budget discipline and debt management. Fiscal rules are a mechanism designed to promote long-term economic stability by setting mandatory limits on budget deficits, public borrowing, and spending policies. However, Türkiye relies on flexible policies instead of binding fiscal rules to maintain fiscal discipline. This approach raises economic unpredictability, exposes public finances to political influence, and undermines international investor confidence. In countries like Türkiye, efforts to establish fiscal rules have periodically gained momentum, primarily through legislative initiatives aimed at strengthening budget discipline. One such bill proposed a comprehensive framework to ensure debt sustainability and fiscal discipline. The Fiscal Rule Bill sought to link public finances to long-term objectives by imposing strict limits on budget deficits and borrowing. Nonetheless, it was not enacted for various political reasons (Kesik & Bayar, 2010: 47-48). The bill's rejection caused Türkiye to stray from binding fiscal frameworks. Instead, budget targets are now set using tools like the Medium-Term Programme (MTP). However, since these are not binding, governments often deviate from their budget targets (Aydemir & Birinci, 2021: 86-88). Such deviations increase uncertainties in public finances, undermining international investors' confidence in Türkiye's fiscal policy. The flexible structure of the MTP cannot sufficiently enforce budget discipline during economic crises.

In countries lacking fiscal rules, public finances tend to be more susceptible to populist policies, as the absence of binding constraints permits discretionary fiscal measures that can jeopardise long-term stability. Notably, during election periods, increases in public spending and deviations from budget targets have overshadowed fiscal discipline. This situation has shifted public resources from areas supporting long-term economic growth to short-term consumption expenditures. For example, public spending intended for infrastructure investments or education is often diverted to short-term populist promises during elections. The absence of fiscal rules is a key factor elevating uncertainty in the Turkish economy. In nations without a long-term fiscal framework, the lack of clear policy guidelines can heighten investors' risk perception and result in higher borrowing costs. For international investors, fiscal rules offer predictability and bolster confidence. While such mechanisms support investor trust in countries with established fiscal rules, their absence in countries without such frameworks contributes to increased external borrowing costs. The failure to control budget deficits and the unsustainable debt dynamics are further consequences of lacking fiscal rules. During economic crises, increased expenditure coupled with decreased revenues rapidly inflates public debt in countries without established fiscal

frameworks. The budget deficit raises interest burdens, exerting additional pressure on public expenditures and limiting resources for social and infrastructure investments. International credit rating agencies point out that the lack of fiscal rules negatively impacts Türkiye's credit rating. Low credit ratings raise external borrowing costs and hinder economic growth (Demirkan, 2010: 10). Conversely, lower borrowing costs and higher credit ratings are typical in EU countries where fiscal rules are present. Fiscal rules also act as an automatic stabiliser in economic cycles. The absence of such rules in Türkiye results in the loss of this balancing mechanism. Sudden downturns in public finances during crises lead to expanding budget deficits and unsustainable debt levels (Kesik & Bayar, 2010: 55-56). This situation heightens the vulnerability of the Turkish economy to crises.

To the best of our knowledge, this study examined the effects of fiscal rules on public debt management in EU countries and Türkiye for the period 2008-2022. The results supported the H1 hypothesis. The factors influencing interest payments were analysed through five models (L1.dint and L2.dint), each incorporating various lagged levels of relevant macroeconomic variables.

Table: 4
Main Findings (Summary)

Variables	Model I	Model II	Model III	Model IV	Model V
L1.dint	1.3622*	1.3652*	1.3419*	1.3726*	1.2358*
L2.dint	-0.3552*	-0.3605*	-0.3482*	-0.3968*	-0.3389*
cab	-0.0254*	-0.0263*	-	-	-
pdebt	-	-	-0.0003****	-	0.0003****
inf	0.0107**	-0.0002****	0.0079***	0.0057****	0.0013****
Interactions	fri*inf: 0.0045	frsi*inf: 0.0008**	dnofr*pdebt: -0.0112*	dnofrs*cab: -0.0256**	dnofr*cab: 0.1031*
Results	Budget balance and inflation have been demonstrated to influence borrowing costs, while the significance of first-generation fiscal rules has been substantiated.	Second-generation fiscal rules have been shown to exert a notable effect on inflation.	The impact of public debt is limited, and implementing first-generation fiscal rules has been shown to reduce borrowing costs.	Second-generation fiscal rules have been demonstrated to be effective in ensuring budget discipline.	First-generation fiscal rules have been shown to impact the budget balance positively.

Source: from Table 3.

The first and the following generations of fiscal regulation adopt different approaches to ensuring the sustainability of public finances. The first generation is formulaic; budget deficits, debt, and some additional spending are the main focus. The subsequent generation aims to replace rigidity and inflexibility by considering economic cycles. Both regulations are equally vital for managing public finance and are intertwined with a tax basis.

Essential areas of Türkiye's public sector finance and economic policy evaluations are inadequately developed and operate under regulations affecting borrowing costs, fiscal issues, and related matters. To assess Türkiye's public finance and economic policies based on these aspects. A comparison with EU countries reveals deficiencies in fiscal conduct, the subsequent impact on public debt, budget balance, and Türkiye's borrowing costs ex-ante. After analysing Tables 2 and 3 and the implications of these findings, many core problems of the public economy and fiscal policies become apparent, affecting both theoretical and practical frameworks in Türkiye. The current study's results, as shown in Tables 2 and 3, are closely associated with issues stemming from deficiencies in Türkiye's fiscal policies

and the absence of established fiscal rules. These findings align with prior research on fiscal rules, particularly concerning their effects on borrowing costs, budget discipline, and debt sustainability. Existing literature suggests that fiscal rules foster macroeconomic stability by enhancing market confidence and reducing borrowing costs (Bergman et al., 2016; Stawiarska, 2023). Supporting these findings, this study indicates that first-generation fiscal rules notably stabilise borrowing costs and improve the budget balance (dnofr*pdebt: -0.0112; dnofrs*cab: -0.0256). Additionally, the study confirms the well-established relationship between inflation and borrowing costs previously highlighted in the literature (Eyraud et al., 2018; Combes et al., 2017), as evidenced by the positive and significant links between inflation and interest payments (inf: 0.0107**, 0.0079***). Moreover, the negative correlation observed between budget balance and borrowing costs (cab: -0.0254*) emphasises the importance of fiscal discipline as a vital factor for debt sustainability, a conclusion consistent with earlier studies such as those by Kopits & Symansky (1998) and Tapsoba (2012).

However, this study distinguishes itself from previous research by providing a more detailed analysis of how fiscal rules influence public debt service costs over time. While many studies focus on the effects of fiscal rules on overall debt sustainability (Von Hagen & Harden, 1995; Piątkowski, 2024), this research highlights the role of lagged interest payments (L 1. dint: 1. 3622), demonstrating the persistence of borrowing costs in Türkiye due to the lack of binding fiscal frameworks. Unlike studies examining fiscal rules at an aggregate level, this work offers a more nuanced understanding of the relationship between debt levels and borrowing costs by showing the limited yet statistically significant impact of the debt- to- GDP ratio (pdebt: -0. 0003**). These findings contribute to the literature by providing empirical evidence on the specific transmission mechanisms through which fiscal rules influence debt dynamics, rather than focusing solely on budgetary outcomes. The current work identifies budget balance (cab) as a key factor that reduces borrowing costs (cab: p< 0. 01). However, Türkiye' s historically high budget deficits during past crises underscore the link between the absence of fiscal rules and weaknesses in budget management (Şimşek & Günay- Bekâr, 2008: 101, 101,117). Noteworthy examples include the crises of 2001 and 2008, during which pressure mounted on the budget balance due to inadequate control over public expenditures. In this context, the findings reinforce the importance of fiscal rules in maintaining budget discipline, as observed in EU countries. Additionally, the research strongly suggests that inflation (inf) influences rising borrowing costs. The results (inf: p< 0. 05) clearly demonstrate a relationship between increasing inflation rates and the escalation of public borrowing costs in Türkiye. Notably, periods of high inflation, particularly during the 1970 s and 1990 s, were associated with a sharp rise in borrowing costs. Furthermore, the consistently low and stable inflation rates observed in EU countries highlight the indirect role of fiscal rules in promoting price stability. Conversely, the absence of fiscal regulations in Türkiye has directly amplified the negative impact of inflation on public finances.

The influence of first-generation fiscal rules on public debt (dnofr*pdebt: p<0.01) highlights Türkiye's struggle to manage its debt stock during crises effectively. The

significant rise in public debt during the 2001 crisis can be linked to the lack of fiscal regulations. In contrast, the positive effect of second-generation fiscal rules on the budget balance (dnofrs*cab: $p < 0.1$) suggests that fiscal reforms implemented in EU countries, such as the Maastricht Criteria and the Stability and Growth Pact, could serve as a useful framework for Türkiye. The absence of these second-generation fiscal rules in Türkiye has hindered the country's ability to control budget deficits and achieve fiscal sustainability.

While fiscal rules are essential for promoting budgetary discipline and ensuring debt sustainability, their strict enforcement can limit governments' ability to implement countercyclical fiscal policies, especially during economic downturns. Overly rigid fiscal frameworks may lead to procyclical adjustments, exacerbating economic contractions by reducing the flexibility of public finances and hampering the effectiveness of automatic stabilisers. Additionally, excessively restrictive fiscal targets can cause suboptimal allocation of public resources, lowering investment in vital infrastructure, education, and healthcare, and thereby weakening long-term economic resilience and growth prospects. The balance between fiscal discipline and policy flexibility highlights the need for well-designed fiscal rules that support economic stabilisation while maintaining credibility in public finance management.

In this context, the present study's findings are directly linked to the deficiencies in Türkiye's fiscal policy, especially considering its historical crises. The main issues stemming from Türkiye's absence of fiscal rules during these crisis periods include high-interest payments, weaknesses in budget balance, and the negative impacts of inflation on fiscal strategies. The experiences of EU countries in applying fiscal rules offer a valuable reference for Türkiye. The study suggests that Türkiye should undertake a comprehensive reform involving both first- and second-generation fiscal rules. Such reforms are expected to enhance fiscal sustainability and support economic stability.

6. Conclusion

This study explores the impact of first- and second-generation fiscal rules on public debt management, emphasising the differences between Türkiye and EU countries. The findings show that fiscal rules promote discipline in public finances. In EU nations, such rules have positively influenced budget balance, interest payments, and inflation. Conversely, Türkiye's lack of these regulations has resulted in higher borrowing costs and macroeconomic instability.

In countries like Türkiye, where fiscal rules are not firmly established, the heavy reliance on borrowing interest paid on prior values (L1.dint and L2.dint) and the absence of budget discipline (cab) are key factors that contribute to vulnerabilities in public finance. The lack of first-generation fiscal rules, which directly regulate public debt and budget deficits, has led to high levels of debt and deficits, as seen during the crises of 1994 and 2001. Conversely, the experiences of EU countries show that a flexible framework of second-generation fiscal rules can be more effective during times of crisis, promoting

economic stability. Türkiye's absence of such rules has made its fiscal framework more vulnerable to economic fluctuations.

The findings reveal that inflation (inf) increasingly impacts borrowing costs in nations without fiscal regulations. Historical evidence from such economies shows that periods of high inflation coincide with rising public borrowing expenses and declining market confidence. Conversely, EU nations' low and stable inflation rates suggest that effective fiscal rules indirectly support price stability.

In conclusion, countries like Türkiye, where fiscal rules are not firmly established, need to implement comprehensive reform programmes to achieve fiscal discipline and economic sustainability. These reforms should include first- and second-generation fiscal rules to control budget deficits and reduce borrowing costs. The experiences of EU countries show that fiscal rules can support economic stability and improve the long-term viability of public finances. By developing its fiscal rule framework based on these insights, Türkiye can boost market confidence and strengthen its resilience against economic crises.

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