Evaluating Fiscal Performance: A Fixed-Effect Panel Threshold Approach to National and Supranational Rules *

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Abstract

Fiscal rules are designed to prevent budget deficits arising from frequent and abrupt changes in countries' fiscal policies. These changes can be attributed to shifts in regional and global economic conditions, as well as short-term decisions made by governments. Recently, the COVID-19 pandemic has led to increased government spending and borrowing, rendering governments more vulnerable. In this context, the implementation of fiscal rules has gained renewed attention. However, to construct a more resilient infrastructure against future crises, it is not only the national fiscal rules that are critical, but also the presence of supranational fiscal rules that can ensure coordination and discipline among countries has become increasingly important. This study, therefore, seeks to analyze the impact of national and supranational fiscal rules on fiscal performance in 31 advanced economies over the period 2000-2020, utilizing the fixed-effect panel threshold model approach. The results indicate that national fiscal rule implementations become effective after a certain threshold level, whereas supranational fiscal rules are effective both below and above a specific debt threshold. This implies that while both types of fiscal rules are effective, supranational rules stand out in terms of their magnitude and their effectiveness even at lower levels of debt. These findings are expected to guide policymakers in evaluating fiscal rule policies and balancing local needs with the achievement of regional objectives.

Keywords: Fiscal Rules, Fiscal Policy, Panel Threshold.

1. INTRODUCTION

The increasing debt ratios in the 1970s and 1980s highlighted the necessity of supporting a monetary union with a rule-based infrastructure. This realization led to the initiation of fiscal rule implementations in several countries at the beginning of the 1990s. From this perspective, the Maastricht Treaty of 1992, which imposed numerical limits on fiscal indicators, emerged as a binding supranational rule. It was followed by the Stability and Growth Pact (SGP) in 1997, aimed at ensuring member countries of the monetary union have more stable and coordinated public finances (Kumar et al., 2009). In this historical context, the rapid increase in the number of countries that implement fiscal rules also accelerated because of the 2007-2008 global financial crisis, reflecting a response to a pressing need (Gootjes et al., 2021). The recent global economic, demographic, and health shocks have caused a slowdown in economic activities globally, leading to significant disruptions in the public finances of countries. As a result, fiscal rules have once again come to the forefront and have begun to be discussed in the literature. As of the end of 2021, approximately 105 economies have at least one fiscal rule in place, with more than half of these being emerging economies. Additionally, 53 countries have supranational fiscal rules in addition to their national fiscal rules (Davoodi et al., 2022).

Fiscal rules are defined in the literature as numerical limits that impose lasting constraints on fiscal aggregates (Kopits and Symansky, 1998). According to the study, fiscal rule implementations help to ensure macroeconomic stability, support financial policies, and contribute to fiscal sustainability. Fiscal rules also increase fiscal responsibility by preventing discretionary practices by politicians and governments that could disrupt public fiscal discipline (Eyraud et al., 2018). In this context, fiscal rules not only function to correct economic structures impaired during crises, but also prevent factors leading to "deficit bias" such as fiscal illusion, as discussed by Buchanan and Tullock (1965).

One of the fundamental functions of fiscal rules is to strengthen a country's public finances and macroeconomic structure against future shocks and potential crises (Kumar et al., 2009). In this context, the nexus between fiscal rule implementations and countries' fiscal performance has come to the spotlight. Some studies investigated how fiscal rules may affect fiscal performance for countries that have different levels of development. In this context, some studies have examined the effectiveness of different types of fiscal rules and their impact on fiscal performance. For instance, Debrun et al. (2008) used dynamic panel estimators to analyze the effect of budget and debt rules on budget deficits for 25 EU countries during 1990-2005. According to their findings, the implementation of fiscal rules reduces budget deficit. Similarly, Badinger and Reuter (2017) investigated whether fiscal rule implementations improved budget balances for 74 countries during the period 1985-2012. They found that fiscal rules had a positive impact on the budget (for a detailed discussion, see Nerlich and Reuter, 2013; Cordes et al., 2015).

Although many studies theoretically and empirically investigate the effectiveness of expenditure, debt, and budget rules, the number of studies examining the impact of national and

supranational fiscal rules on countries' fiscal performance is relatively limited. In a theoretical context, supranational fiscal rules have emerged to prevent member countries of economic and monetary unions from implementing independent and unstable fiscal policies, and to ensure monetary and fiscal coordination within the union (Kumar et al., 2015). On the other hand, national fiscal rules, designed according to the economic structures and domestic needs of individual countries. However, it is essential not to consider these two types of rules in isolation but rather to view them as complementary and supportive, aiding countries in formulating stable economic policies (Pench et al., 2019).

Consequently, while some studies investigating the impact of supranational and national fiscal rules on countries' fiscal performance have shown national fiscal rules to be more effective in influencing fiscal performance (Tapsoba, 2012; Kantorowicz, 2014; Bergman et al., 2016), some others indicate the greater efficacy of supranational fiscal rules in this regard (Drazen, 2002; Annett, 2006; Mileusnic, 2021). Given the diversity of social, political, and economic conditions across countries, it is challenging to conclusively state which type of fiscal rule, national or supranational, is more effective in impacting fiscal performance. The scarcity of discussions in the literature on this topic underscores the need for further exploration into the effectiveness of national and supranational fiscal rules.

In this context, our study aims to analyze the impact of national and supranational fiscal rule implementations on fiscal performance for 31 advanced economies over the period 2000-2020, using Hansen's (1999) fixed-effect panel threshold model. Contrary to existing literature, this study contributes to the field by examining whether the effectiveness of fiscal rules varies according to countries' debt levels. In selecting country groups, we follow the approach of Debrun et al. (2008) and focus exclusively on advanced countries rather than Emerging Market Economies (EMEs), as the former predominantly adopt supranational fiscal rules. Consequently, examining the effects of these rules within these countries is likely to yield more effective results. The period has been determined based on the availability of fiscal rule variables from the IMF fiscal rule database and other explanatory variables, ensuring the most optimal period for analysis is selected.

The existing literature is far from providing a clear-cut answer regarding the effectiveness of national and supranational fiscal rules and often neglects a comparative approach to examine these types of fiscal rules. Moreover, the literature frequently overlooks the assumption that these effects may vary depending on macroeconomic dynamics, such as debt levels. Consequently, the present study aims to address these gaps. Motivated by these considerations, it seeks to contribute to the current literature through a more comprehensive analysis that takes into account these factors. The study's findings are expected to guide policymakers in the design of national fiscal rules and the adoption of supranational fiscal rules for advanced economies.

The study proceeds as follows: Section 2 presents a brief literature review. Section 3 describes the dataset and explains the methodology used. Section 4 presents and discusses the estimation results. Section 5 concludes.

2. LITERATURE REVIEW

Studies in literature have focused on the various effects of fiscal rules. For instance, some research has examined the relationship between fiscal rule implementations and fiscal performance, finding that fiscal rules can have a positive effect on fiscal performance (for instance, see, Debrun et al., 2008; Nerlich and Reuter, 2013; Fall et al., 2015). Some others analyzed the nexus between fiscal rules and bond spreads and found that fiscal rules implementations reduce bond spreads (see, for instance, Thornton and Vasilakis, 2017; Afonso and Jalles, 2019). Furthermore, some studies in literature categorize fiscal rules into specific types: debt, expenditure, and budget rules, analyzing each type's distinct effects (Afonso and Guimarães, 2015). Other studies adopt a broader perspective, differentiating between national and supranational fiscal rules (see, for instance, Bergman et al., 2016; Tapsoba, 2012). This approach examines the overall impact of these rules on fiscal performance, considering the governance level - whether rules are implemented nationally or across multiple nations.

Although advanced economies reinforce supranational fiscal rules with national fiscal rule practices (Kumar et al., 2009), it is still crucial for countries to distinguish between them in formulating medium and long-term economic policies. Some studies in the literature have theoretically assessed the effectiveness of these two types of fiscal rules. According to Kantorowicz (2014), the implementation of supranational fiscal rules is less binding and less effective in terms of interfering with a country's fiscal autonomy compared to national rules. Therefore, countries may tend to report inaccurately when adhering to supranational fiscal rules. On the other hand, some studies argue that national fiscal rules are designed in accordance with the economic structures of countries, therefore, provide a more flexible response to economic shocks and regional economic needs (Cordes et al., 2015). However, the effectiveness of national fiscal rules in ensuring fiscal discipline over supranational fiscal rules remains a debatable issue (Bergman et al., 2016). Rather than viewing this situation as a zero-sum game, it is argued that national fiscal rules are more closely related to local preferences and decisions, while supranational rules are more suitable for broader economic practices (Hallerberg et al., 2009).

From the empirical point of view, some studies specifically analyze the effectiveness of national and supranational fiscal rules on economic growth, fiscal discipline, and fiscal performance. For instance, Bergman et al. (2016) investigated whether national fiscal rules alone are sufficient for sustainable public finance and whether these rules need to be supported by good governance. They used dynamic panel methods to analyze 27 EU economies and concluded that fiscal rules reduce structural primary deficits. They also found that supranational rules do not affect the efficacy of national fiscal rules in reducing deficit bias. Similarly, Kantorowicz (2014) analyzed the effectiveness of national and

supranational fiscal rules for 81 countries during the period 1985-2012, employing both fixed-effect (FE) model and Generalized Method of Moments (GMM) estimators. The author proposed that national fiscal rules have a positive impact on budget balance, whereas the impact of supranational fiscal rules is weaker. For an analysis of numerical fiscal rules of developing countries, Tapsoba (2012) analyzed the effectiveness of national rules for 74 developing countries by using the propensity score matching method over the period 1990-2007. According to the author's findings, national fiscal rule implementations have been positively associated with budget balance.

The studies briefly mentioned above generally indicate that national fiscal rule implementations are more effective on budget balance compared to supranational fiscal rules. However, this outcome will vary depending on the characteristics, specific structures, and levels of development of the countries (Tapsoba, 2012). Indeed, there are also studies presenting findings on the effectiveness of supranational fiscal rule implementations. For instance, Annett (2006) conducted an extensive analysis including supranational rules for 14 EU countries during the period 1980-2004. The results indicate that supranational rules positively impact fiscal performance in small economies implementing fiscal contracts. The reason for this is suggested to be that violating such rules can damage a country's reputation and that in volatile economies, these rules serve as an external anchor. This finding, however, aligns with Drazen's (2002) view that countries are under pressure to comply with supranational fiscal rules. Indeed, meeting the criteria required by a monetary union acts as a prerequisite, therefore, supranational rules play a significant role in shaping a country's fiscal and monetary indicators.

Moreover, Barbier-Gauchard et al. (2021) state that fiscal discipline in the European Monetary Union (EMU) is thought to be provided by the implementation of supranational fiscal rules like the SGP and the domestically designed national fiscal rules. Similarly, Krogstrup and Wyplosz (2010) theoretically explored the role of national and supranational fiscal rules in eliminating deficit bias. They argued that supranational fiscal rules are more effective than national fiscal rules in reducing deficit bias, but they do not eliminate it completely. This finding indicates that while supranational rules contribute significantly to fiscal discipline, they are not a complete solution for overcoming the tendency of governments to run deficits. These are well confirmed by the study of Kraemer and Lehtimäki (2023). The authors examined the impact of national and supranational fiscal rules on government debt for EU member states from 1990 to 2019. The authors emphasized that both types of fiscal rules are not substitutes, but rather complement each other. They highlighted the role of supranational fiscal rules, such as the Stability and Growth Pact (SGP), in reducing overall government debt. This study suggests that supranational fiscal rules play a significant role in maintaining fiscal discipline and reducing government debt levels within the EU.

Although the discussions in the literature about the effectiveness of national and supranational fiscal rules are limited, it is challenging to assert that one type of rule is more effective than the other. National fiscal rules are designed according to a country's economic structure, enabling them to act as a

buffer that can respond flexibly and promptly to external shocks. On the other hand, supranational fiscal rules, considered in the context of the conditions required for membership in a union, appear to positively influence a country's fiscal performance as an external coercive factor. Therefore, our study aims to contribute to the current literature with an original value by specifically investigating which type of fiscal rules are much more effective on fiscal performance for 31 developed economies.

3. DATA AND METHODOLOGY

In this study, the effect of national and supranational fiscal rules on fiscal performance for 31 advanced economies during the 2000-2020 period will be analyzed by means of a fixed-effect panel threshold model. Current debates in literature focus on which rule is more effective, examining this question through various models. In this context, the impact of national fiscal rules designed according to each country's economic structure, as well as one-size-fits-all supranational rules harnessed at a regional level, becomes prominent. Our study, therefore, aims to disentangle the question whether supranational or national fiscal rules are more effective in fiscal performance in advanced economies.

Within this framework, the ratio of the primary budget balance to GDP is employed as the dependent variable, a proxy for fiscal performance. The variables of interest include nationally applied fiscal rules (*nation*) and supranationally implemented ones (*supra*). As for the control variables, the dataset comprises the real GDP per capita growth rate (*growth*), the ratio of government expenditure to GDP (*govexp*), population growth rate (*popu*), CPI-based inflation rate (*inf*), and the government effectiveness index (*govefc*). The debt variable (*gdebt*) is utilized as a threshold value, aligning with the research questions of the study. The past value of the debt variable (*dgdebt*) is also added as explanatory variable so as to include its lagged impact on the current budget balance. Data related to fiscal rules has been obtained from the IMF's fiscal rule database. The selection of data is guided by its relevance to existing literature and its appropriateness for the analysis being conducted. Detailed information about the dataset, including the sources and specifics of each variable, is provided in Table 1 below.

Table 1. Data definition

Variables	Definitions	Sources
National Fiscal Rules (nation)	Dummy takes the value 1, if a national rule is in place; otherwise, 0	
Supranational Fiscal Rules (supra)	Dummy takes the value 1, if a supranational rule is in place; otherwise, 0	IMF (2022a)
Government Primary Budget Balance (pbb)	Difference between governments' revenues and their non-interest expenditures (% of GDP)	IMF (2022b)

(Cont. Table 1) Data definition

Variables	Definitions	Sources
General Government Gross Debt (gdebt)	All liabilities that should be paid or require payments of interest and/or principal (% of GDP)	IMF (2023)
Inflation (inf)	Annual percentage change in consumer price index (CPI %)	World Bank (2022a)
Real per capita GDP Growth Rate (growth)	Annual percentage growth rate of GDP (based on constant 2015 prices)	World Bank (2022b)
Population Growth (pop)	Annual population growth rate (%)	World Bank (2022c)
Government Expenditure (govexp)	General government total expenditures (% of GDP)	IMF (2022c)
Government Efficiency (govefc)	A variable ranging from -2.5 (weak) to 2.5 (strong) reflects perceptions of the quality of public services, the quality of civil service, and the degree of its dependence from political pressures.	World Bank (2023)

Source: Author's compilation.

Table 2 below presents descriptive statistics related to the data. According to the table, the median value of the debt data is 66%, while the median for the expenditure data stands at 43%. All variables demonstrate normal distributions. Table 2 provides a snapshot of the central tendencies of the key variables under consideration, particularly debt and expenditure, which are critical in assessing fiscal performance and policy impacts.

Table 2. Descriptive Statistics

Variables	Mean	Std. Dev.	Min.	Max.
nation	0.405	0.491	0	1
supra	0.563	0.496	0	1
pbb	0.570	4.349	-28.174	20.570
gdebt	66.604	42.688	3.8	258.7
inf	1.950	1.744	-4.478	12.694
growth	1.948	3.238	-14.629	24.370
popu	0.640	0.709	-3.847	2.890
govexp	43.628	8.037	16.462	66.822
govefc	1.407	0.479	0.155	2.346

Source: Author's compilation.

In our study, while examining the impact of national and supranational fiscal rule implementations on fiscal performance, we also analyze whether this effect changes based on a certain debt threshold value. From this perspective, employing Hansen's (1999) panel threshold model appears to be a suitable method for addressing this research question. Threshold models are extensively applied in the fields of macroeconomics and financial analysis due to their straightforward and clear economic implications. However, the process of estimation and inference in these models is complicated by the presence of nuisance parameters (Wang, 2015). To overcome this problem, the use of Hansen's model facilitates an investigation into the nuances of fiscal rule effectiveness, particularly how it may vary across different levels of national debt. This approach allows for a more nuanced understanding for such an analysis (Ostadzad, 2022), considering the potential variations in effectiveness based on a country's debt situation.

Considering a single-threshold model, the equation can be written as follows:

$$y_{it} = \mu + X_{it}(q_{it} < \gamma)\beta_1 + X_{it}(q_{it} \geq \gamma)\beta_2 + u_{it} + e_{it} \tag{1}$$

In the given Eq (1), q_{it} represents the threshold variable, and γ is the threshold parameter that segregates the equation into two distinct regimes, each characterized by coefficients β_1 and β_2. The term u_{it} denotes the individual effect specific to each entity being analyzed, reflecting unique characteristics or influences that are not captured by other variables in the model. Meanwhile, e_{it} is the disturbance term or the error term, accounting for the variability in the dependent variable that is not explained by the explanatory variables. This structure allows for an analysis that accommodates different behavioral regimes depending on the value of the threshold variable.

The Eq. (1), however, can be rewritten in the following way:

$$y_{it} = \mu + X_{it}(q_{it}, \gamma)\beta + u_{it} + e_{it} \tag{2}$$

where

$$X_{it}(q_{it}, \gamma) = \begin{cases} X_{it}I(q_{it} < \gamma) \\ X_{it}I(q_{it} \geq \gamma) \end{cases} \tag{3}$$

When the threshold parameter γ is specified, the estimation of the coefficient β can be carried out using the ordinary least-squares (OLS) method as follows:

$$\hat{\beta} = \{X^*(\gamma)'X^*(\gamma)\}^{-1}\{X^*(\gamma)'y^*\} \tag{4}$$

In Eq. (4), X^* and y^* represent within-group deviations. This means that y^* is the deviation of the dependent variable from its group mean, and X^* corresponds to the deviation of the independent variables from their respective group means. To estimate the threshold parameter γ, a search may be conducted over a specific subset of the threshold variable q_{it}, rather than across the entire sample.

Additionally, the estimator for γ is identified as the value that minimizes the Residual Sum of Squares (RSS), which can be specified as follows:

$$\hat{\gamma} = arg \min_{\gamma} S_1(\gamma) \tag{5}$$

When the threshold parameter γ is known, the model effectively becomes an ordinary linear model. However, if γ is unknown, it introduces a nuisance parameter issue, which results in the estimator of γ having a nonstandard distribution. This complexity arises because the exact point of regime change (γ) is uncertain, and its estimation significantly influences the model's behavior. Hansen (1999) established that $\hat{\gamma}$ is a consistent estimator for the true threshold parameter γ. He suggested that the most effective way to test the hypothesis $\gamma = \gamma_0$ is to construct a confidence interval using the "no-rejection region" method. This method involves employing a likelihood-ratio (LR) statistic and can be written as follows:

$$LR_1(\gamma) = \frac{\{LR_1(\gamma) - LR_1(\hat{\gamma})\}}{\hat{\sigma}^2} \xrightarrow{Pr} \acute{\varepsilon}$$

$$\Pr(x < \acute{\varepsilon}) = (1 - e^{\frac{-x}{2}})^2 \tag{6}$$

In determining the confidence interval for the threshold parameter γ at a given significance level α, the approach involves identifying specific limits based on the LR statistic series. The lower limit of the confidence interval is found by locating the maximum value in the LR series that is less than the α quantile. Conversely, the upper limit is determined by finding the minimum value in the LR series that also falls below the α quantile. The α quantile, which is a critical value in this process, can be computed using the inverse function of a specified Eq. (6) as follows:

$$c(\alpha) = -2\log(1 - \sqrt{1 - \alpha}) \tag{7}$$

Additionally, testing for a threshold effect in the model essentially involves examining whether the coefficients differ across the regimes identified by the threshold variable. This test is conducted by comparing the null hypothesis and the alternative hypothesis, which are:

$$H_0: \beta_1 = \beta_2 \qquad\qquad H_a: \beta_1 \neq \beta_2 \tag{8}$$

In this section, we defined the data and the methodology used throughout the present study. In the next section, fixed-effect panel threshold estimation results will be presented and discussed.

4. ESTIMATION RESULTS AND DISCUSSION

Table 3 displays the fixed-effect panel threshold model estimation results with national fiscal rules. According to this, the debt threshold level is 80.90%. Moreover, national fiscal rules have a positive but statistically insignificant effect on the budget balance when the debt level is below the

threshold ($\hat{\beta}_1$=0.209). However, once the debt surpasses the threshold level, national fiscal rules positively and significantly affect the budget balance ($\hat{\beta}_2$=2.959). This indicates that in advanced economies, national fiscal rules have a meaningful impact on performance only when the debt exceeds a certain threshold, which is parallel to the findings of (Afonso and Hauptmeier, 2009). This can be interpreted as the credibility and confidence provided by national fiscal rule implementations after debt surpasses a critical threshold, as well as signaling debt sustainability. Considering these factors, the positive impact of national fiscal rules on fiscal performance is consistent with the literature (Tapsoba, 2012; Bergman et al., 2016). Additionally, the past value of the debt stock and government spending negatively and significantly influence the current budget balance, as expected. Moreover, government efficiency has a positive and significant impact on the budget balance. Changes in inflation positively affect the budget balance, which can be explained by the concept of inflation-induced growth in advanced economies. In other words, moderate inflation rates boost spending and investments, leading to economic growth and increasing the number of resources that can be taxed.

Table 3. Fixed-effect Panel Threshold Regression Estimation with National Rules

	Advanced economies
Threshold estimation ($\hat{\gamma}$)	80.90%
95% Confidence Interval	[78.9%-81.3%]
Impact of FRs on FP	
$\hat{\beta}_1$	0.209 (0.296)
$\hat{\beta}_2$	2.959*** (0.499)
Impact of covariates	
$dgdebt_{it}$	-0.185*** (0.055)
$growth_{it}$	-0.043 (0.037)
$govexp_{it}$	-0.507*** (0.032)
$govefc_{it}$	1.661*** (0.559)
$popu_{it}$	-0.096 (0.212)
inf_{it}	0.136** (0.055)
Observations	620
N	31

Notes: *, **, and *** indicate the significance at 10%, 5% and 1% level, respectively. Standard errors are given in parentheses.

Table 4 presents the fixed-effect panel threshold model estimation results with supranational fiscal rules. Firstly, it seems that the debt threshold level rises to 128.80%, which could be attributed to the structure of supranational fiscal rules as they have more strict monitoring and implementation mechanisms. This would enable countries to sustain even higher levels of government debt. Moreover, supranational fiscal rules positively and significantly impact the budget balance, both below and above the debt threshold level. This implies that, unlike national fiscal rules, the effectiveness of supranational fiscal rule implementations does not require the debt to exceed a specific critical level to be effective. Additionally, the positive effect of supranational fiscal rules above the threshold is greater in magnitude compared to the impact of national fiscal rules ($\hat{\beta}_2$=4.589). This suggests that supranational fiscal rules are more effective in advanced economies than national fiscal rules. The effectiveness of supranational fiscal rules can be attributed to their obligatory enforcement due to concerns about damaging national prestige if violated (Annett, 2006), their more effective implementation mechanisms (Asatryan et al., 2018), their role as external coercive factors compelling countries to meet the macroeconomic criteria required for monetary union membership (Coman, 2017), and the increase in the number of fiscal targets for countries, contributing to the formation of fiscal policies that serve fiscal performance (Kumar et al, 2009).

Similarly, the past value of debt stock and government spending exhibit a negative and significant impact on the current budget balance. This suggests that higher past debt levels and increased government expenditure may lead to a reduced budget balance. Additionally, the efficiency of government positively and significantly influences the budget balance, indicating that more efficient government operations can lead to better fiscal outcomes. Furthermore, changes in inflation have a positive effect on the budget balance. This phenomenon can be understood through the lens of inflation-induced growth, particularly prevalent in advanced economies.

Table 4. Fixed-effect Panel Threshold Regression Estimation with Supranational Rules

	Advanced economies
Threshold estimation ($\hat{\gamma}$)	128.80%
95% Confidence Interval	[122.00%-131.20%]
Impact of FRs on FP	
$\hat{\beta}_1$	0.986** (0.476)
$\hat{\beta}_2$	4.589*** (0.732)
Impact of covariates	
dgdebt$_{it}$	-0.183*** (0.055)
growth$_{it}$	-0.004 (0.037)

(Cont. Table 4) Fixed-effect Panel Threshold Regression Estimation with Supranational Rules

	Advanced economies
$govexp_{it}$	-0.469*** (0.031)
$govefc_{it}$	1.309** (0.551)
$popu_{it}$	0.096 (0.212)
inf_{it}	0.226*** (0.056)
Observations	620
N	31

Notes: *, **, and *** indicate the significance at 10%, 5% and 1% level, respectively. Standard errors are given in parentheses.

Considering all the findings that we discussed above; it is observed that both types of fiscal rules are effective in influencing fiscal performance, which is in line with the findings of Kraemer and Lehtimäki (2023). However, supranational fiscal rules appear to be more effective than national fiscal rules, as they are effective both below and above the debt threshold level and have a greater impact in terms of magnitude. These findings contribute to the literature on the effectiveness of fiscal rules by adding the dimension of whether the impact varies depending on the level of indebtedness. This additional perspective enriches the understanding of fiscal rule implementations and their implications for fiscal performance.

5. CONCLUSION

The debt crises of the 1970s and 1980s demonstrated the necessity of establishing a rules-based framework for countries' public financial management. Subsequent regional and global crises made it inevitable for countries to implement various fiscal rules at both the national and supranational levels. The recent economic, demographic, and financial shocks forced countries into unexpected levels of spending while failing to generate anticipated revenues, leading many countries into not only economic but also social and political dilemmas. This situation has re-emphasized the role of fiscal rules in mitigating the economic devastation caused by the pandemic and in restoring discipline in public financial management.

Fiscal rules are practices that impose restrictions not only on debt but also on government expenditures, revenues, and budget aggregates. These rules were initially implemented in advanced economies and have gradually been adopted by developing economies. Consequently, debates on which type of fiscal rule is more effective for countries have emerged in the literature. Although countries often implement multiple fiscal rules simultaneously rather than one, debates about the effectiveness of fiscal rules continue. Studies in literature generally show that expenditure, debt, and budget rules are more

effective on fiscal performance. However, very few studies have investigated the effectiveness of national and supranational fiscal rule implementations. Understanding the difference between national rules designed according to a country's macroeconomic structure and supranational rules externally applied to countries that are members of a union or aspire to be, is important for comprehending the dynamics of these rules.

Therefore, our study intends to analyze the impact of national and supranational fiscal rules on fiscal performance for 31 advanced economies between 2000 and 2020, using the fixed-effect panel threshold method. Additionally, it is considered whether the effectiveness of fiscal rules changes according to countries' debt levels. The mentioned method is deemed appropriate as it offers the opportunity to answer this research question as well. The period and countries were selected based on the availability and suitability of data.

According to the estimates using national fiscal rules, the debt threshold level for advanced economies is 80.90%. When the debt level is below this threshold, national fiscal rules have a positive but statistically insignificant effect on fiscal performance. However, when the debt level exceeds this threshold, national fiscal rules positively and significantly influence fiscal performance. On the other hand, estimates with supranational fiscal rules show the debt threshold level rising to 128.80%. This suggests that supranational fiscal rules, due to their stricter and more effective enforcement mechanisms, can maintain sustainability even at higher debt levels. Supranational fiscal rules have a positive and significant impact on fiscal performance both below and above the debt threshold, with a larger magnitude of effect above the threshold.

National fiscal rules become effective when the debt level exceeds a certain critical value, while supranational fiscal rules are effective both below and above the debt threshold, with both types of rules having a positive impact on fiscal performance. These findings are consistent with other studies that suggest national fiscal rules positively affect fiscal performance (Tapsoba, 2012; Kantorowicz, 2014; Bergman et al., 2016), and those that argue supranational fiscal rules positively influence fiscal performance (Annett, 2006; Kumar et al., 2009). However, this study contributes to the literature by demonstrating that supranational fiscal rules are more effective than national fiscal rules and that this effectiveness varies depending on the country's level of indebtedness.

These results underscore the need for countries to consider their current and future debt levels when designing national fiscal rules and evaluating the implementation of supranational fiscal rules. Future research can extend the analysis of the effectiveness of national and supranational fiscal rules to emerging economies, thereby enabling a discussion on the effectiveness of fiscal rules across countries with varying levels of development. Such an approach could guide countries in implementing policy rules tailored to their economic policies, offering policy recommendations that are aligned with their specific economic circumstances.

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