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Public Revenue and Public Expenditure as Predictors of Economic Growth: The Case of BRICS Countries

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ABSTRACT

Public revenue and public expenditure represent essential components for economic progress and prosperity. The optimal balance between public revenue and public expenditure could have positive and lucrative implications for economic growth. This paper aims to highlight the interaction between these components analyzing their relationship in the short- and long-run. The subject of the research implies the nexus between public revenue, public expenditure and economic growth in BRICS countries from 2006 to 2023. We applied static and dynamic panel models to provide a detailed analysis of potential indications of public revenue and public expenditure on economic growth. The obtained findings point out that public revenue and public expenditure significantly affect economic growth, with the greatest impact registered in China and India. The contribution of the research implies new specific insights and perspectives for policymakers in BRICS from the aspect of identifying optimal fiscal policy, as well as making decisions related to revenue-expenditure components and their implications on economic growth.

Keywords: *public revenue, public expenditure, economic growth, BRICS countries*

JEL Classification: H20, H50, O40

INTRODUCTION

The term BRICS was initially defined by Jim O'Neill in his report (Jim O'Neill, 2001) to refer to a collective of nations comprising Brazil, Russia, India, China, and South Africa. Namely, Molefe and Mah (2020) and Banday et al. (2021) define this group as a partnership recognized for its rapidly expanding economies, which have substantial effects on local and global economic activities. Similarly, Zharikov (2021) highlights the positive potential of BRICS in reshaping the global economic system and supporting the world economy. Accordingly, BRICS stands out as one of the dominant trade integration blocks (Chhabra et al. 2023) and plays a substantial role in the global economy (Li, 2021), with significant contributions in terms of population, gross domestic product, land coverage, world trade, and global exchange reserves (Iqbal, 2021). Therefore, the issue of economic growth of BRICS is gaining more place and importance in theoretical and empirical studies. In our study, we focus on fiscal and government determinants such as public revenue and public expenditure that can influence overall economic growth. Public revenue and public expenditure play crucial roles in influencing economic growth. Based on Glavaški et al. (2022),

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determining the causal relationship between revenue and expenditure may seem straightforward at first glance. Ensuring an adequate revenue collection and productive expenditure level creates preconditions for intensive economic growth and development. Arvin et al. (2021) highlighted that tax revenue and public expenditure are important drivers of economic growth in the long run. When the government collects more revenue than it spends, it can decline budget deficits, lower public debt levels, and potentially stimulate economic growth through increased investment. On the other hand, excessive government spending without sufficient revenue can lead to budget deficits, greater inflation, and crowding out private investment, which may hinder economic growth. Therefore, the composition of public expenditure also matters for economic growth. Conversely, excessive spending on unproductive sectors or inefficient programs may not yield significant economic benefits and could potentially crowd out private investment. Likewise, Nzimande and Ngalawa (2022) indicate that any rise in current expenditure would inevitably require a subsequent increase in future taxation. Based on the above-mentioned, we can conclude that a balanced approach to public revenue generation and public expenditure management is essential for sustainable economic growth. By ensuring that public revenue is efficiently collected and spent on productive investments, governments can create an enabling environment for economic progress and development.

The paper's structure is outlined as follows. After the introduction, a literature review includes previous empirical studies on the nexus between public revenue, public expenditure and economic growth. The third section covers methodology and data with variable selection and description and developed hypotheses. The fourth section presents the empirical results of applied dynamic models to provide the effects of public revenue and public expenditure on economic growth in BRICS countries (Brazil, Russia, India, China, and South Africa) from 2006 to 2023. The last section provides a summary of findings and conclusions, along with recommendations for future research.

LITERATURE REVIEW

The interaction between public revenue, public expenditure and economic growth is often the subject of theoretical and empirical analyses aimed at identifying their potentially causal relationship. Đurović Todorović et al. (2019) confirmed a positive correlation between direct tax revenue and GDP growth rate in OECD countries from 1996 to 2016. Furthermore, Joseph and Omodero (2020) identified the positive influence of tax revenue on gross domestic product in Nigeria for the period 1981-2018. In contrast, Onifade et al. (2020) found no causality between public expenditure and real GDP in Nigeria for the period 1981-2017. The study of Chu et al. (2020) confirmed the significance of public expenditure for economic growth in the sample of 59 countries (37 high-income and 22 low—to middle-income countries) for the period 1993-2012. Neog and Gaur (2020) found a positive impact of tax revenue such as taxes on property and taxes on capital transactions, as well as a negative influence of income tax and service taxes on economic growth. For instance, Gurdal et al. (2021) investigated the relationship between tax revenue, public expenditure and economic growth in G7 economies for the period 1980-2016. Their findings of applied frequency domain causality indicated short-run and long-run causality between economic growth and tax revenue, and long-run causality between economic growth and public expenditure. Also, Ansari et al. (2021) confirmed the unidirectional causality between public spending and economic growth in the analysis of the BRICS-SAARC-ASEAN region for the period 1991-2019. Bidirectional causality between GDP and public expenditure was also found in the study of Ghazy et al. (2021) which analyzed their relationship in Egypt from 1960 to 2018. Using the Generalized Linear Model, the results of Onofrei et al. (2022) verified the significant and positive impact of selected revenue and expenditure indicators on GDP per capita in 21 EU countries from 2001 to 2019. Kirikkaleli and Ozbaser (2022) conducted research on the relationship between public expenditure and economic growth in the U.S. from 1960 to 2019. Their findings identified that economic growth stimulates public expenditure in the long run,

while public expenditure positively affects economic growth in the short run. Employing the ARDL model, Poku et al. (2022) confirmed that public expenditure has a positive effect on economic growth in the short run in Ghana for the period 1970-2016. Tendengu et al. (2022) confirmed a positive relationship between fiscal policy indicators and economic growth in South Africa for the period 1988-2018. On the other hand, Nguyen and Ngyen (2023) suggest that there is a positive effect of government spending on economic growth, while tax revenue negatively changes with economic growth in Vietnam.

Based on the cited studies, one can observe the importance of the relationship between public revenue and public expenditure and its significance for economic growth. Examining these components through the sample of BRICS countries expands the existing theoretical opus and contributes to new insight regarding the relationship of these variables.

METHODOLOGY AND DATA

The paper analyzes the relationship between public revenue, public expenditure and economic growth in BRICS countries (Brazil, Russia, India, China, and South Africa). We used an annual data series from the International Monetary Fund Database for the period 2006-2023. The variable selection and description are presented in Table 1.

Table 1. Variable description

Variable	Abbreviation	Calculation	Expected effect
Gross domestic product	GDP	annual rate	/
Public revenue	GR	% of GDP	+
Public expenditure	GE	% of GDP	-

Source: Authors' illustration

Considering the identified research's objective, the paper includes one general hypothesis and two auxiliary hypotheses:

- H₁: There is a significant relationship between public revenue, public expenditure and economic growth in BRICS countries in the long run.
- H_{1.1}: Public revenue positively affects the economic growth in BRICS countries in the long run.
- H_{1.2}: Public expenditure negatively affects the economic growth in BRICS countries in the long run.

RESULTS AND DISCUSSION

This section of the paper comprises descriptive analysis, panel unit root tests and static and dynamic models to estimate the potential effects of public revenue and public expenditure on economic growth in BRICS for the period 2006-2023. Descriptive analysis is presented in Table 2.

Table 2. Descriptive statistics

Variable	Mean	Std. dev.	Max.	Min.
Brazil				
GR	40.023	1.291	43.278	38.046
GE	44.941	3.074	49.915	41.581
GDP	2.063	3.168	7.528	-3546
Russia				
GR	34.422	1.668	37.527	31.887
GE	34.615	2.398	39.153	29.04

Variable	Mean	Std. dev.	Max.	Min.
GDP	2.069	4.018	8.55	-7.821
India				
GR	19.616	0.814	21.962	18.177
GE	27.563	1.279	31.057	26.22
GDP	6.541	3.571	10.26	-5.831
China				
GR	25.905	3.521	29.232	17.195
GE	28.975	5.286	35.403	18.151
GDP	7.854	2.987	14.247	2.242
South Africa				
GR	34.422	1.668	37.527	31.887
GE	34.615	2.398	39.153	29.04
GDP	1.759	2.639	5.604	-5.963
BRICS				
GR	30.877	7.518	43.278	17.195
GE	34.142	6.891	49.915	18.151
GDP	4.057	4.160	14.247	-7.821

Source: Authors' calculation

Table 2 includes individual and group descriptive analysis of public revenue, public expenditure and gross domestic product for BRICS countries from 2006 to 2023. The average GDP growth rate was 4.057%, where China and India registered the greatest growth rates of 7.85% and 6.541% at average level. For instance, Brazil and Russia had similar mean growth rates of around 2%, while South Africa achieved an average GDP growth of 1.76%. Analyzing public revenue and public expenditure, the average shares were 30.88% and 34.14 of GDP. The highest shares of these variables were identified in Brazil (40.02% and 44.94% of GDP). At the same time, India registered the smallest shares of public revenue (19.62% of GDP) and public expenditure (27.56% of GDP) in the observed period.

Table 3. Panel unit root tests

Variable	GDP	GR	GE
LLC test			
Level	-6.428***	-5.957***	-4.389***
First diff.	-11.235***	-8.516***	-8.483***
IPS test			
Level	-3.465***	-2.799***	-2.820**
First diff.	-6.661***	-3.956***	-4.844***
Breitung test			
Level	-1.767	-0.444	-0.151
First diff.	-6.836***	-4.312***	-5.424***

Source: Authors' calculation

The results of applied unit root tests indicated that selected variables are stationary (LLC test), and non-stationary (Breitung test) at a significance level of 1%. The values of the IPS test indicate that GDP and GR are stationary at a level of 1%, while GE is stationary at a level of 5%.

Table 4. Static models

Model	RE	FE
Variable		
GR	0.382***	0.461***
GE	-0.796***	-0.830***
R-squared	0.383	0.341
Hausman test	63.58 (0.000)	

Source: Authors' calculation

Table 4 includes a random-effects model and a fixed-effects model to identify how public revenue and public expenditure influence economic growth, measured by the GDP growth rate. The results of the Hausman test showed that the fixed-effects model is an appropriate model which confirmed a significant and positive impact of public revenue. Specifically, a 1% increase in GR leads to a GDP growth rate increase of 0.46%. Conversely, public expenditure negatively affects GDP, which implies that a higher GE level of 1% declines GDP by 0.83%.

Table 5. Dynamic models

Model	PMG		MG	
Variable	Short-run	Long-run	Short-run	Long-run
GR	0.062	0.350***	0.139	0.563***
GE	-0.642**	-0.703***	-0.571	-0.684***
ECT	-1.040***		-1.147***	
Hausman test	1.02 (0.601)			

Source: Authors' calculation

After static models, we applied dynamic models such as Pooled Mean Group Estimators (PMG) and Mean Group Estimator (MG) to identify the effect of public revenue and public expenditure on economic growth in the short-run and long-run. Based on the Hausman test, PMG is a proper model for estimating the influence of selected variables on economic growth. The speed of adjustment (ECT) is significant and negative and affirms a long-run equilibrium between observed variables. The effects of public expenditure are significant in the short run and long run, while public revenue significantly affects economic growth only in the long run. Specifically for the long-run period, a 1% increase in GR enhances GDP by 0.35%, while the same growth of GE decreases GDP by 0.70%. This means that public revenue has a greater impact on economic growth compared to public revenue in BRICS countries for the observed period.

Table 6. PMG estimator by country

Variables	Brazil	Russia	India	China	South Africa
Δ GR	0.195*	0.246*	0.451**	0.566***	0.372**
Δ GE	-0.247*	-0.412*	-0.764***	-0.602***	-0.183***
ECT	-1.027	-1.289	-0.890	-1.159	-0.837

Note: the asterisks *, **, *** indicate significance level of 10%, 5% and 1%

Source: Authors' calculation

Table 6 represents the results of the selected PMG estimator by country to provide a detailed analysis of the potential relationship between public revenue and public expenditure and economic growth measured by gross domestic product by country. We can notice that the value of ECT is negative, which implies the presence of dynamic stability among observed variables. Therefore, we can conclude that public revenue and public expenditure significantly affect

economic growth in BRICS countries in the long run. However, it is necessary to indicate the greatest impact of public revenue on economic growth in China (0.566), while public expenditure mostly influences economic growth in India (0.764). Also, the impacts of public revenue and public expenditure become significant for Brazil and Russia only at a level of 10%.

CONCLUSION

The global economic landscape is undergoing significant transformation with emerging economies such as those in BRICS countries. These economies (Brazil, Russia, India, China and South Africa) have more and more influential roles in the international economic system in terms of shaping global economic trends and policies and making a diversified economic environment. Therefore, BRICS becomes an interesting area for investigating and estimating macroeconomic structure and trends. The paper conducts empirical research on the relationship between public revenue, public expenditure and economic growth in BRICS (Brazil, Russia, India, China and South Africa) for the period 2006-2023. The results of applied analysis have shown that public revenue and public expenditure significantly affect economic growth in the long run. It denotes that general hypothesis H_1 can be validated. Furthermore, public revenue positively influences economic growth, where the highest impact is identified in China (0.566). It denotes that auxiliary hypothesis $H_{1.1}$ can be validated. Likewise, government expenditure negatively affects economic growth with the highest impact in India (0.764). Therefore, based on the obtained findings, we can accept auxiliary hypothesis $H_{1.2}$. Although we identified a negative effect of public expenditure on economic growth, it is necessary to carefully consider the types of expenditures which directly or indirectly contribute to generating economic growth. It implies that governments should focus more on productive expenditure to provide substantial positive indications for economic development. Hence, Chu et al. (2020) indicated that a reallocation of public expenditure from nonproductive to productive forms is linked to higher levels of economic growth. Therefore, governments that make strategic public expenditure choices can effectively support economic growth (Ma and Qamruzzaman, 2022). It is imperative for policymakers in BRICS to establish transparent and stable economic policies that help stimulate investment activities and foster economic growth (Buhtelezi, 2023). By effectively managing public revenue and public expenditure, policymakers can support economic development, enhance social welfare, and create a conducive environment for overall economic progress. The paper provides an additional empirical approach for nexus revenue-expenditure-growth, as well as a fresh interpretation of existing data. Likewise, the research manifests specific insights and perspectives for policymakers in BRICS. Understanding how revenue generation and expenditure allocation affect growth can lead to more effective economic policies and strategies aimed at fostering sustainable development. Based on the significant effects of public revenue and public expenditure, BRICS countries should focus on revenue growth and expenditure control to provide favorable implications for economic growth. The limitation of the research can be partial considering economic determinants focusing only on public revenue and public expenditure as one of the most essential fiscal policy components. That particularly refers to the structure of public expenditure which play an important role in the influence on the economic growth. Future research will focus on a comparative analysis between BRICS and G7 economies in terms of the effects of fiscal determinants on economic growth.

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