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An Application on The Effect of Government Efficiency on Economic Growth: Evidence from BRICS-T Countries

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Article Info	ABSTRACT
Article History Received: 03/01/2024 Accepted: 16/04/2024 Published: 30/06/2024	All processes associated with the provision of public services, policy formulation and implementation of these services fall within the scope of government effectiveness. Government effectiveness therefore promotes economic growth through the adoption of fair and transparent policies, improvement of the investment climate and effective enforcement of economic regulations. This creates a confidence in the economy, new business opportunities and ultimately an increase in the overall welfare of the society. As a result, assessing the effect of government effectiveness on economic growth is crucial. The goal of this study is to see how government efficiency affects
Keywords: Government Efficiency, Economic Growth, Panel Data Analysis	economic growth in the BRICS-T countries. For this purpose, balanced panel data analysis was performed by creating four different models for the relevant countries in line with the data obtained for the period 2002-2021. As a result, it is estimated that the increase in government efficiency affects economic growth in the direction of increase for each model. The effects of gross fixed capital formation, employment and foreign direct investment variables on economic growth are estimated to be positive in parallel with the expectations.
Jel Codes: H50, O40,	

Kamusal Etkinliğin Ekonomik Büyüme Üzerindeki Etkisine İlişkin Bir Uygulama: BRICS-T Ülkelerinden Bulgular

Makale Bilgileri	ÖZ
Makale Geçmişi	Kamu hizmetlerinin sunulması, bu hizmetlere dair politika oluşturulması ve uygulanmasına ilişkin süreçlerin tamamı kamusal etkinlik kapsamında ver almaktadır. Dolayısıyla kamusal etkinlik, adil
Geliş: 03/01/2024 Kabul: 16/04/2024 Yayın: 30/06/2024	ve şeffaf politikaların benimsenmesi, yatırım ortamının iyileştirilmesi ve ekonomik düzenlemelerin etkili bir şekilde uygulanması yoluyla ekonomik büyümeyi desteklemektedir. Bu durum sayesinde ekonomide güven ortamı sağlanmakta, yeni iş fırsatları oluşmakta ve nihayetinde toplumun genel
Anahtar Kelimeler: Kamusal Etkinlik, Ekonomik Büyüme, Panel Veri Analizi	refahında artış meydana gelmektedir. Bu açıdan kamusal etkinliğin ekonomik büyüme üzerindeki etkisinin belirlenmesi önemli görülmektedir. Bu doğrultuda çalışmada gelişmekte olan büyük ekonomileri temsil eden BRICS-T ülkelerinde kamu etkinliğinin ekonomik büyüme üzerindeki etkisinin belirlenmesi amaçlanmaktadır. Bu amaçla 2002-2021 dönemleri için ulaşılan veriler doğrultusunda ilgili ülkeler nezdinde dört ayrı model oluşturularak dengeli panel veri analizi
Jel Kodları : H50, O40, C20	gerçekleştirilmiştir. Panel veri analizi sonucunda kamusal etkinlikteki artışın her model için ekonomik büyümeyi artış yönünde etkilediği tahmin edilmiştir. Gerçekleştirilen analizlerde yer verilen sabit sermaye oluşumları, istihdam ve doğrudan yabancı sermaye yatırım değişkenlerinin ise ekonomik büyüme üzerindeki etkisi beklentilerle uyumlu şekilde pozitif yönde tahmin edilmiştir.

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INTRODUCTION

The weight of the public sector in the economic order has increased especially after the 1929 Economic Depression with the impact of Keynesian policies. Although the presence of the public sector in the economic order has continued in the historical process, different missions have been attributed to the public sector. Today, it is aimed to protect public welfare by imposing responsibilities such as accountability, transparency and quality on the public sector. Furthermore, in accordance with the welfare state theory, public expenditures are regarded as a significant issue in terms of the efficiency of the public sector. Therefore, public sector expenditures and their financing process is an important issue in terms of public efficiency (Noyan and Samancı, 2022). In this respect, the effective and efficient use of resources by the public sector can be defined as government efficiency. All processes associated with the provision of public services, policy formulation and implementation of these services are included within the scope of government efficiency. Rainey (2003: 5) stated that government efficiency is an important element for the public sector to achieve its objectives and to ensure public trust. Government efficiency describes the ability to provide public services in a way that is fit for purpose. In this respect, it refers to the relationship between the resources spent and the public benefit provided. Generally accepted characteristics of good government effectiveness can be stated as follows (Andrews, 2010):

- Structural budgeting techniques including fiscal rules and medium-term budgeting,
- Input controls and performance measurement,
- Use of improved financial management,
- Legal regulations on budget transparency and accountability.

Criteria such as quality in public administration, efficiency in revenue policy, quality in budget management and quality in fiscal management are considered important for increasing success in government effectiveness (Kaufmann, Kray and Mastruzzi, 2009). The importance of public governance elements such as government effectiveness has been emphasized by organizations like as the World Bank and the United Nations in recent years. In this respect, it can be stated that only countries with a good public governance system can achieve economic improvement. Henisz (2000) argues that it is important for governments to provide a healthy investment climate for the private sector, which is crucial in economic growth and development. In this context, public policies that support private property rights can be said to be the most important factor in attracting the long-term capital investment that developing countries need. Additionally, political decision-making plays a significant role in shaping the policies that governments will pursue, according to Sasmaz (2019). This is because the decisions taken not only have social and political ethics but also have economic consequences. For example, in a situation where government effectiveness is good, decisions can be made more objectively and quickly and important policies for the country can be implemented quickly. The level of welfare can also be significantly affected by breakthroughs in economic, social, cultural, political, etc. areas depending on government effectiveness. Accordingly, direct or indirect government actions affecting the market may affect economic growth (Pradhan and Sadyan, 2011).

Through their actions, governments can increase the attractiveness of a country to attract investment both nationally and internationally. Since investors are reluctant to invest in countries with politically unstable, complex bureaucracy, high levels of corruption, non-transparent and ineffective government services, the investment environment desired by investors can be achieved by the governments in charge of the country. Thus, the increase in the level of investment and the amount of production in the country can contribute to the increase in the level of economic growth. Therefore, governments have a say on the level of economic growth of the country as a result of their effective practices (Kaufmann and Kraay, 2002).

In a situation where government efficiency is fully achieved, social welfare, economic stability and economic growth can be positively affected. Government efficiency refers to a multifaceted indicator based on the use of various policy instruments and strategies. In this context, factors such as various public expenditures, human resources, technological progress, diplomacy, social welfare are factors that affect the determination of government effectiveness. As such, one key metric for guaranteeing economic growth is the efficacy of the government. This study tries to ascertain the impact of government efficiency on economic growth, given the emphasis placed on the role that public efficiency plays in growth. This effect will be realized through panel data analysis for BRICS-T Countries (Brazil, Russia, India, China, South Africa and Türkiye) in order to represent large-scale emerging economies and includes estimates for the period 2002-2021. In this study, BRICS-T countries were evaluated as worthy of research due to their rapid growth since the 2000s, their potential to attract foreign investment, their cheap labor force and their rapidly increasing influence on the global economy.

1. LITERATURE REVIEW

The literature contains researches that investigate the connection between economic growth and government efficacy using a variety of sample sizes. However, the relationship between government efficiency and economic growth in BRICS-T countries has a constraint. Hazman (2010) found that there was a positive correlation between government effectiveness and economic development in 23 OECD nations between 2002 and 2008. Güney (2017) estimated that for 78 developing nations between 1996 and 2015, there was a positive association between economic growth and government effectiveness. Furthermore, between 2002 and 2018, Doğanay and Değer (2020) calculated the influence of institutions on economic growth in the categories of less developed, developing, and developed countries. As a result, it was estimated that government effectiveness is a factor that positively affects economic growth. Güran and Cingi (2002) conducted a data envelopment analysis using data from 55 countries to measure the impact of government intervention on economic output. The study concluded that regulation is an effective instrument on economic output. Omoteso and Mobolaji (2014) aimed to determine the impact of governance indices on economic growth for the period 2002-2009. In their study, they concluded that government effectiveness has a negative impact on economic growth. The study also revealed that accountability practices and rule of law indicators have a more positive impact on economic growth in the region.

Ftoreková and Mádr (2017) in their study, in which Balkan countries were selected as the sample for the 2000-2015 period, concluded that improving the rule of law has no significant effect on economic growth. Using the panel regression method, Topal, Ünver, and Türedi (2017) calculated the impact of public sector size and government quality on economic development in the Turkic Republics from 2002 to 2015. As a result of the estimation, the effect of government quality, including the public efficiency indicator, on economic growth is found to be negative for Türkiye and positive for other Turkic Republics. Özdemir and İmamoğlu (2021) conducted a panel causality analysis to test the relationship between economic growth and various governance indicators in G20 countries for the period 2002-2018. The study's findings indicate that, although a causal association exists between government performance and economic growth in industrialized nations, there is no such relationship in developing nations. Bercu, Tofan, Cigu and Petrisor (2019) examined the relationship between public efficiency and economic growth for 11 different European countries for the period 2000-2017. Consequently, a substantial correlation between public efficiency and economic growth in Bangladesh, India, Nepal, Pakistan, and Sri Lanka is positively correlated with increased government effectiveness.

Çevik and Eraslan (2019) aimed to determine the impact of governance quality on economic performance in BRICS-T countries. As a result of the study, they found that the increase in the governance quality of countries has a positive effect on economic performance. Fayissa and Nsiah (2013) aimed to determine the impact of government effectiveness on economic growth in a sample of 39 Sub-Saharan African countries for the period 1995-2004. They concluded that government effectiveness has a positive effect on economic growth. However, this effect varies according to the income level of the country. Using the GMM analytic method, Alam, Kitenge and Bizuayehu (2017) examined the link between economic growth and government effectiveness for 81 nations. Thus, it was determined that there is a positive substantial relationship between government efficacy and economic growth. Şaşmaz and Sağdıç (2020) looked into how the rule of law and government efficacy affected economic growth. Eleven nations that comprise the transition economies of the European Union were chosen as the sample for the years 2002–2018 in this direction. Consequently, it was estimated that government effectiveness has a positive effect on economic growth. Mehenna, Yazbeck and Sarieddine

(2010) examined the impact of governance on economic development in the MENA region for the period 1996-2005 and concluded that government effectiveness has a positive impact on economic development. For the years 1999–2003, Quibria (2006) calculated the impact of governance on economic growth for 28 developing nations. According to the estimation results, government effectiveness actually has the opposite influence on economic growth as predicted. Ince and Tari (2023) found that increases in productivity had a favorable impact on welfare and economic growth based on their study with a sample from Türkiye.

2. METHODOLOGY

This research aims to evaluate the relationship between government efficiency and economic growth in the BRICS-T countries. In this study, BRICS-T countries were evaluated as worthy of research due to their rapid growth since the 2000s, their potential to attract foreign investment, their cheap labor force and their rapidly increasing influence on the global economy. After the Cold War, BRICS countries tended to realize their strategic interests in the international arena in a common way. In this regard, country leaders exchange information on various issues at the BRICS Summit held every year (Xiujun, 2020). Türkiye on the other hand, has exhibited an economic performance close to the BRICS countries in recent years and Türkiye's aim to be among the emerging economies requires it to be evaluated together with these countries. In this context, a panel data analysis was conducted using the data of the countries determined as the sample for the period 2002-2021. Since there is no unavailable data as of the years specified in the country data included in the analysis, it can be said that it is a balanced panel data method. Panel data analysis has a significant advantage as it provides estimation in terms of both period and time. Panel data analysis requires model selection among three different estimation models: Ordinary Least Squares (OLS), Random Effects (RE) and Fixed Effects (FE). The least squares method aims to determine the effect of explanatory variables on the dependent variable with pooled data. In addition, fixed effects can be used to determine the fixed cross-section coefficients for each unit, while random effects can be used if the coefficients are determined randomly (Baltagi, 2005). The test to be performed at the last stage in order to determine the model includes the Hausman test. The Hausman test aims to determine which of the fixed effects or random effects models will be used. The formula for the statistic of the Hausman test is shown as follows:

$$W = \frac{(\tilde{\beta}_{FE} - \tilde{\beta}_{RE})^2}{Var\left[\tilde{\beta}_{FE}\right] - Var\left[\tilde{\beta}_{RE}\right]} \sim \chi_K^2$$

In the equation, βFE represents the estimate of the coefficient of the FE model, while βRE represents the estimate of the coefficients of the RE model. Table 1 provides information on the variables used in the panel data analysis conducted to determine the impact of government efficiency on economic growth in BRICS-T countries for the period 2002-2021.

Table 1. Information About Variables

Variable Name	Variable Shortening	Variable Source
Government effectiveness	ge	World Bank
Economic Growth	gdp	World Bank
Foreign Direct Investment	fdi	World Bank
Gross Fixed Capital Formation	gfc	World Bank
Employment Rate	етр	World Bank

Studies such as Suziki (2012), Mcnabb, 2018), Karataş and Ergül (2023), Sodipe and Ogunrinola (2011) were utilized while constructing the model to determine the impact of government

efficiency on economic growth. To reduce the skewness of the variables included in the study and smooth the variation in variances, they were logarithmized and included in the model (*gdp*, *gfc*, *fdi*). The model created in this direction is given below:

 $loggdp_{it} = \alpha_{it} + \beta_1 ge_{it} + \beta_2 loggfc_{it} + \beta_3 logfdi_{it} + \beta_4 emp_{it} + \varepsilon_{it}$

 $loggdp_{it}$ = logarithmic national income level in country i for period t

 α_{it} = fixed effect

 ge_{it} = level of public efficiency in country i for period t

 $logfdi_{it}$ = logarithmic foreign direct capital inflows in country i for period t

 $loggfc_{it}$ = gross capital investments in country i for period t

 emp_{it} = employment rate in country i for period t

 $\varepsilon it = \text{error term},$

i = number of countries,

it = the relative values of the countries included in the model in the t period.

The variable used in the model as government effectiveness and all the variables used in the model were obtained from the official website of the World Bank. The government effectiveness variable reflects the quality of public services, the level of independence from political pressures, the quality of public policy formulation and implementation, and confidence in the government's overall policies. The government effectiveness indicator is one of the governance indicators and is based on groups such as public institutions, civil society organizations, household and firm surveys. Government effectiveness data is expressed as a value between 0 and 100. The GDP variable refers to the gross domestic product (GDP) measured in 2015 constant prices in US dollars. The data on foreign direct investment indicates net foreign investment inflows in US dollars. The fixed capital investments variable indicates the ratio of expenditures on fixed investments and changes in stock levels to gross domestic product. Employment rate refers to the ratio of the employed population above the age of 15 to the total population.

3. FINDINGS

The purpose of this research is to ascertain the impact of government efficiency on economic growth in BRICS-T countries. For this reason, a balanced panel data analysis was conducted using annual data for the period 2002-2021. Descriptive statistics and correlation matrices for the data used are given in the appendix. Table 2 presents the F Test, Breusch-Pagan LM Test and Hausman test for model selection for the panel data analysis.

	1 RE	2 RE	3 FE	4 FE
Horizontal Section	267,517	114,845	49,441	29,513
F Test	[0,000]	[0,000]	[0,000]	[0,000]
Breusch-Pagan	955,047	536,354	38,867	2,714
LM Test	[0,000]	[0,000]	[0,000]	[0,099]
Hausman Test	0,046	4,484	158,876	136,190
	[0,828]	[0,106]	[0,000]	[0,000]

 Table 2. Model Identification Test

Note: "[]" stands for probability value. RE: Random Effects, FE: Fixed Effects

In order to determine the model, firstly the F Test was performed to determine which of the ordinary least squares (OLS) and fixed effects (FE) models to choose. According to the F test results in

Table 2, it is seen that the FE model will be preferred to the OLS model according to each model since $F_{calculus} > F_{table}$. In the second stage, the Breusch-Pagan LM Test was performed to decide which of the ordinary least squares (OLS) or random effects (RE) models to use. Accordingly, RE model is preferred to the least squares method for each model. In the last stage, Hausman test is performed and it is seen that the random effects and fixed effects model is applicable.

Dependent	Dependent variable: <i>loggdp</i> N:6 T:20 Number of Observations: 120				
Variables	1 RE	2 RE	3 FE	4 FE	
С	27,404 (50,328)***	25,866 (30,550)***	16,815 (33,400)***	15,944 (16,396)***	
ge	0,009 $(2,216)^{**}$	$0,008 \\ (1,855)^*$	0,005 (2,864)***	0,007 (2,560)**	
loggfc		$0,499 \\ (2,065)^{**}$	1,194 (12,765)***	0,937 (6,706)***	
logfdi			0,291 (14,544)***	0,263 (6,809)***	
emp				0,041 (5,696)***	
R ²	0,040	0,071	0,752	0,857	
Ad. R ²	0,032	0,055	0,696	0,857	
F - Statistic	4,951	4,498	13,390	25,170	

Table 3. The Impact of Government Efficiency on Economic Growth

Notes: ***, ** and * denote significance at 1%, 5% and 10% level, respectively. "()" denotes the *t statistic* value. RE: Random Effects, FE: Fixed Effects

The analysis conducted to ascertain the impact of governmental efficiency on economic growth is presented in Table 3. Accordingly, the step method was preferred in order to estimate the contribution of each variable to the model separately. In addition, it is evident that the economic growth variable is significantly impacted by each of the model's components.

First, the model incorporates the government efficiency variable. It is observed that the government efficiency variable has a substantial positive effect on economic growth in every model. In Model 4, it is estimated that a increase in government efficiency increases economic growth by 0.007% units. This outcome aligns with predictions and the literature (Alam et al. 2017; Şaşmaz and Sağdıç, 2020; Hazman, 2010). In the second stage, gross capital investment was added to the model. It is estimated that the increase in gross capital investment affects economic growth in the direction of increase for each model. This outcome is consistent with predictions and existing research (Grdinić et al., 2017; Mcnabb, 2018). Gross capital investment can be expressed as the value of physical assets used in the production process and can increase growth in this respect.

In the third stage, foreign direct investment is added to the model. It is observed that the foreign direct investment is positively significant for each model. In the last model, 1% increase in foreign direct investment level is estimated to increase economic growth by 0.26%. This result is consistent with expectations and the literature. In addition, studies such as Assanie and Singleton (2002), Papaioannou and Sotiris (2004), Liu et al. (2009) and Suziki (2012) also concluded that an increase in FDI increases economic growth. Foreign investments have a significant impact on the economic growth of a country. Especially in developing or underdeveloped countries, it is obvious that this effect will be higher. In the last stage, employment rate is added to the model. Employment rate is estimated to be positively significant on economic growth. It is observed that a unit increase in employment rate increases economic growth by 0.041% unit. This outcome is in line with predictions and existing research (Akan

et al. 2008; Hussain et al. 2010; Sodipe and Ogunrinola, 2011). It can be stated that if employment is not provided at an adequate level, the economic order will be negatively affected by this situation and therefore economic growth will tend to decrease. Moreover, the R^2 value, which is an indicator of explaining the universe for model 4, was realized as 0.85.

CONCLUSION

Public policies, which increased within the economic structure with the Keynesian economic approach, have continued to increase over time, assuming different missions. Today, principles such as transparency, accountability and independence of public policies are among the fundamental characteristics for public welfare. In this regard, the standard of public services rendered, resistance to political pressure, and confidence in the administration's implementation of public programs are all indicators of government efficacy. Therefore, with the increase in government effectiveness, the environment of trust in the economic order can lead to social and economic improvement.

The purpose of this research is to examine the effect of government efficiency on economic growth in BRICS-T countries. For this purpose, balanced panel data analysis was performed by creating four different models for the period 2002-2021. According to the findings of the study, the increase in government efficiency has an upward effect on economic growth for each model. This result is consistent with the literature and expectations. Economies with an efficient government quality will create an environment of trust, which will lead to investment attraction capacity, productivity growth, fair competition and a strong environment for foreign trade. Therefore, it can be stated that the policies pursued in BRICS-T countries, which represent large emerging economies, in terms of giving importance to government effectiveness will contribute to economic growth.

The other variables included in the panel data models are employment, foreign direct investment and gross capital investment. According to the studies' findings, it is predicted that the increase in employment affects economic growth in an upward direction. Since an increase in employment is in a sense a result of an increase in production, an increase in the level of economic growth may also occur as a result. Foreign direct investment is included as another variable. It is estimated that an increase in foreign direct investment increases economic growth. Since there will be an increase in productivity in countries with foreign investment inflows, there will be an increase in economic growth. The other variable included in the model is gross capital investment. The value of the tangible assets used in the production process, or gross capital investment, is measured and is thought to rise in tandem with economic expansion.

In conclusion, it can be said that government effectiveness has an important function in ensuring economic growth. The basic dynamics of the economy can be strengthened by improving important conditions such as direct government intervention in the economy, investments, regulatory activities, efforts to provide better services, and ensuring transparency in public accounts. Therefore, in economies with an optimum level of trust, there will be an increase in both domestic and foreign investments, a rise in both the output level and the society's overall welfare level.

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An Application on The Effect of Government Efficiency on Economic Growth: Evidence from BRICS-T Countries

Annex 1. Descriptive Statistics

	loggdp	ge	loggfc	logfdi	emp
Mean	27,924	54,236	3,244	23,868	53,699
Median	27,924	55,714	3,186	24,047	51,801
Maximum	30,394	75,714	3,842	26,564	72,507
Minimum	26,187	31,753	2,517	20,250	39,718
Standard Error	1,03	9,918	0,349	1,440	8,632
Number of Observations	120	120	120	120	120

Annex 2. Correlation Matrices

	loggdp	ge	loggfc	logfdi	emp
loggdp	1				
ge	0,012	1			
loggfc	0,699	0,301	1		
logfdi	0,877	-0,114	0,548	1	
emp	0,787	-0,197	0,386	0,701	1